

REVISION OF THE
MIRINE GENUS *PHYTOCORIS*
FALLÉN
(HETEROPTERA: MIRIDAE) FOR
WESTERN NORTH AMERICA

GARY M. STONEDAHL



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ABSTRACT

The western Nearctic species of the cosmopolitan genus *Phytocoris* Fallén are revised. *Ecertobia* Reuter and *Pallacocoris* Reuter are proposed as new junior synonyms of *Phytocoris*. One-hundred and ninety-nine species are recognized including four that also occur in the Palearctic region. The species are distributed among 20 newly proposed species-groups, primarily on the basis of head morphology, dorsal vestiture, and characteristics of the male genitalia. Seventy-eight new species are described and the following new synonymies are proposed (senior synonym first): *acaciae* Knight = *minuendus* Knight; *calli* Knight = *laticeps* Knight; *deserticola* Knight = *lineatellus* Knight; *empirensis* Knight = *rinconae* Knight; *fraterculus* Van Duzee = *westwoodi* Bliven; *fuscipennis* Knight = *longirostris* Knight; *geniculatus* Van Duzee = *blackwelli* Bliven; *interspersus* Uhler = *viridescens* Knight; *juniperanus* Knight = *chiricahuae* Knight, *flaviatus* Knight, *santaritae* Knight; *ketinelbi* Bliven = *kahtahbi* Bliven; *knowltoni* Knight = *albertae* Knight, *elongatus* Knight; *laevis* (Uhler) = *rolfsi* Knight; *maritimus* Van Duzee = *sequoiae* Bliven; *neglectus* Knight = *yuroki* Bliven; *nigrifrons* Van Duzee = *abiesi* Knight, *tehamae* Bliven; *relativus* Knight = *albiscutellatus* Knight; *stellatus* Van Duzee = *arcatae* Bliven, *tinctus* Knight; *stitti* Knight = *albiceps* Knight, *merinói* Knight; *strigosus* Knight = *flavellus* Knight; *sublineatus* Knight = *subcinctus* Knight, *tanneri* Knight; *tenuis* Van Duzee = *gracillatus* Knight; *ventralis* Van Duzee

= *contrastus* Knight, *ephedrae* Knight, *quadricinctus* Knight; *vinaceus* Van Duzee = *hyampom* Bliven; *yollabollae* Bliven = *albiclavus* Knight, *montanae* Knight, *taos* Knight.

Illustrations are provided for the male genitalia of all species, and scanning electron micrographs are presented for the head, pretarsus, and dorsal vestiture of representative species. Dorsal habitus illustrations are provided for representatives of nine species-groups. A detailed diagnosis and description are included for the genus and each of the 20 species-groups. A key to species-groups is given, as well as keys to the species of each group. All species treatments include a diagnosis and summary information on biology, host plant associations, and distribution. Detailed descriptions and specific locality data are included only for the new species.

Phytocoris species diversity and endemism are greatest in shrub and steppe, and desert communities of the southwestern United States. The majority of western Nearctic species are host-specific inhabitants of trees and shrubs, but a few ubiquitous species are known to breed on grasses and herbaceous plants. Many species occurring on woody plants appear to be inhabitants of bark. The nymphs and adults of most species are believed to be primarily predaceous. Nearctic and Palearctic species have been observed feeding on small, soft-bodied insects and mites, including several important pests of forests and orchards.

INTRODUCTION

Phytocoris is the largest genus in the subfamily Mirinae, with over 500 described species throughout the world. Approximately four-fifths of these species occur in the Holarctic region. The remaining taxa are distributed predominantly in temperate zones of the Southern Hemisphere with very few species occurring in tropical regions. In the Nearctic region, the genus is represented by 283 species. The fauna of eastern North America is well known, with the keys of Knight (1941) adequately distinguishing most species. One-hundred and ninety-nine species are now known from western North America, 78 of which are described as new in the present study.

The major sources of biological information deal primarily with Palearctic species (Butler, 1923; Kullenberg, 1944; Southwood

and Leston, 1959; Wheeler and Henry, 1977). Most species inhabit trees and shrubs, but a few are known to breed on grasses and herbs. Bark-inhabiting species are common on both coniferous and deciduous trees. The majority of species are host plant specific, but some inhabit and probably breed on a number of plant species. One generation per year is assumed for most species, with overwintering occurring in the egg stage. Several bivoltine populations have been reported in North America (Knight, 1941; Wheeler and Henry, 1977). Adults and nymphs are considered to be primarily predaceous, but phytophagous species have been reported by Knight (1927c), Southwood and Leston (1959), Wagner (1970–71), and Wheeler and Henry (1977). Small, soft-bodied insects (e.g., aphids, psocids, psyllids, scales) and mites

are common prey for Nearctic and Palearctic species.

The present study is limited to the *Phytocoris* species of western North America, excluding Mexico. Prior to this research, the only extensive treatment of the genus in western North America was by Knight (1968). Although Knight described many new taxa, his review of western species is not complete, since nearly 100 additional species can now be recognized. Knight's species-groups are not monophyletic, and his group key often places closely related taxa in different species-groups. Further, the identities of many species described in the late 19th and early 20th centuries by O. M. Reuter and P. R. Uhler have remained obscure because of inadequate original descriptions and the lack of properly designated type specimens. Henry and Stonedahl (1983) have since designated types for all North American species of *Phytocoris*.

The present paper is organized to aid in the identification of species and species-groups of *Phytocoris* in western North America. Twenty newly proposed species-groups and 199 species are recognized in the study. A key to species-groups follows the generic discussion in the Systematics section. Species-groups are organized alphabetically in the text, as are the species within each group. Taxa that could not be satisfactorily placed in one of the species-groups are treated at the end of the Systematics section under the heading "Species with uncertain group affiliation." Dorsal habitus illustrations are placed near the group descriptions. Illustrations of structural features are grouped together at the end of each species-group treatment.

LITERATURE REVIEW

The genus *Phytocoris* (*phyton*, Greek, "plant," plus *coris*, Greek, "bug") was erected by Carl F. Fallén in 1814. Westwood (1840) designated *Cimex populi* Linnaeus as the type species of the genus. Unlike many widely distributed taxa that were described early in the 19th century, *Phytocoris* does not have a complex nomenclatural history. Three genera have been treated as synonyms of *Phytocoris*: *Callodemas* Uhler, *Compsocerochoris* Reuter, and *Dionyza* Distant. The genus *Compsocerochoris* was described by Reuter (1876: 70) (type species: *annulicornis* Reuter,

1876, monobasic) based on specimens collected in Texas. This genus was placed in synonymy with *Phytocoris* by Reuter (1909: 14). Among the reasons for the proposed synonymy was Reuter's discovery that some of the diagnostic characters of *Compsocerochoris* also occurred in typical *Phytocoris* species. Reuter (1909) also referred to the extreme range of variation in the genus *Phytocoris* and the difficulty in recognizing distinct groups because of taxa possessing intermediate combinations of characters. The genus *Callodemas* was described by Uhler (1895: 33) (type species: *laevis* Uhler, 1895, monobasic) based on specimens collected in Colorado and New Mexico. This genus also was synonymized with *Phytocoris* by Reuter (1909: 14). The Neotropical genus *Dionyza* Distant (1891: 113) (type species: *variegata* Distant, 1893, monobasic) was placed in synonymy with *Phytocoris* by Carvalho (1952: 91). In the present study, *Ecertobia* Reuter (1909: 36) and *Pallacocoris* Reuter (1876: 62) also are placed in synonymy with *Phytocoris*.

Most of the early literature for the genus *Phytocoris* consists of species descriptions and faunal lists for the Nearctic and Palearctic regions (see Carvalho, 1959, for references). The first Nearctic species were described by Reuter (1876) based on collections made by Belfrage and Kumlien. The majority of remaining Nearctic species were described by Uhler (1894), Reuter (1909), Van Duzee (1910, 1912, 1914, 1918, 1920, 1923), Johnston (1930), Knight (1920, 1923, 1925a, 1926, 1927a, 1927c, 1928, 1934, 1941, 1961, 1968, 1974), Bliven (1954, 1956, 1959, 1966), Henry (1974, 1979), Kelton (1979), and Stonedahl (1984).

Species of *Phytocoris* are often included in state and regional surveys of Heteroptera or Miridae; some of these are: Uhler (1894), Gillette and Baker (1895), Van Duzee (1903, 1908, 1914, 1917b, 1925), Knight (1923, 1925b, 1941, 1968), Blatchley (1926), Froeschner (1949), and Kelton (1980). Knight (1923) divided the *Phytocoris* species of the eastern United States into four large groups based on color patterns of the hemelytra and antennae, length of antennal segment I, and the shape of the sclerotized process of the vesica. The most comprehensive study of eastern North American species is by Knight (1941). The only extensive treatment of west-

ern Nearctic species prior to the present study is by Knight (1968), in which five species-groups were defined on the basis of color patterns of the second antennal segment. Regional studies of Palearctic species are by Southwood and Leston (1959), Wagner and Weber (1964), and Wagner (1970–71). A number of subgenera have been proposed for this genus in the Palearctic region (see Wagner, 1970–71).

The structures of the male and female genitalia of *Phytocoris* have been investigated by Slater (1950) and Kelton (1959). Slater (1950) included only one species of *Phytocoris* in his study of female genitalia, which emphasized the posterior wall of the bursa copulatrix and the sclerotized rings of the dorsal labiate plate. Female genitalic structures have not been used in studies of interspecific relationships of the genus *Phytocoris*. However, structures of the male genitalia have proven to be extremely valuable as taxonomic characters. Kelton (1959) included seven species of *Phytocoris* in his study of male genitalia, but only two were discussed and illustrated. Genital parameres were used as early as 1920 by both Knight and Van Duzee to distinguish *Phytocoris* species in North America. In addition to the parameres, Knight (1968) referred to the tubercles above the paramere bases in his keys to western North American species. Appendages of the vesica were used by Knight (1920, 1923, 1941) to distinguish species and species-groups of *Phytocoris* in eastern North America. More recently, these structures have been employed by Henry (1974, 1979), Kelton (1980), and Stonedahl (1984) to assist in the identification of new species. Wagner and Weber (1964) and Wagner (1970–71) used male genitalic characters extensively to distinguish *Phytocoris* species in the Palearctic region.

Biological studies of the genus *Phytocoris* are limited and consist primarily of host plant records and scattered reports of feeding habits and life history information (see Biology section).

MATERIALS AND METHODS

In this study, approximately 20,000 specimens were examined from western North America. Specimens were borrowed from most university collections in the western

United States and Canada, as well as other major collections in North America. The collections, curators, and institutional abbreviations used in the text are given in the Acknowledgments section.

Specimens also were acquired for study during several extended collecting excursions in the summers of 1979, 1980, 1983, and 1986, which reached parts of all western states. Numerous collecting trips were conducted in Oregon, Idaho, Washington, and northern California because the fauna of this region was least well known.

The type specimens of most species were examined during visits to the United States National Museum of Natural History, Washington, D.C. and the California Academy of Sciences, San Francisco. Many paratypes and other specimens identified by H. H. Knight, O. M. Reuter, and E. P. Van Duzee also were examined. Several Reuter types were borrowed from the Swedish Museum of Natural History, Stockholm and the University Zoological Museum, Helsinki, Finland. Some of the Reuter and Van Duzee species were represented by a syntype series. Lectotypes and paralectotypes have been designated for these species by Henry and Stonedahl (1983). Type designations for some of Uhler's species also are given in that paper.

Illustrations were prepared using a Spencer AO stereomicroscope with an ocular grid and a Leitz Wetzlar stereoscope and camera lucida. Genitalic structures were illustrated at magnifications ranging from 64 \times to 100 \times . Measurements were made with an ocular micrometer and are reported in millimeters. Label data are given in the text only for those species described as new. The depositories of all holotypes and paratypes are given in parentheses following the locality data. The distributional data for the remaining species are summarized in the Discussion section of the species treatments. Distributions are sometimes discussed with reference to the biogeographic provinces of Bailey (1978). Host plant records and collection dates are summarized in the Discussion sections. Host plants collected in the field were identified by the staffs of the Oregon State University Herbarium and the New York Botanical Garden. Host plant data given on labels of borrowed specimens were corrected according to Munz and Keck (1973).

Species-group descriptions summarize the structural and color variation displayed by members of the group. Group-specific features not mentioned in the generic description are provided. Species descriptions are compiled from all available specimens and document variation in size, color, and structure. Full descriptions are given only for those species described as new. Detailed diagnoses are provided for the remaining species. The species diagnosis will distinguish a particular taxon from all other members of the species-group.

BIOLOGY

The majority of *Phytocoris* species appear to overwinter in the egg stage. One generation per year is assumed for most species but few direct observations have been reported (Collyer, 1953; Southwood and Leston, 1959). The North American species, *breviusculus*, is believed to be bivoltine in Missouri (Froeschner, 1949) and Pennsylvania (Wheeler and Henry, 1977). Knight (1941) reported a bivoltine life cycle for *neglectus* in New York. Collection records compiled during this study suggest the possibility of bivoltine or multivoltine life cycles for other *Phytocoris* species in western North America. A number of species inhabiting arid regions in the southwestern United States have periods of occurrence ranging from April or May to September or October. These species often show peak periods of abundance in the spring and fall indicating the likelihood of at least two generations per year. Of course, the number of generations per year may vary from one area to another in widely distributed species.

Phytocoris eggs are elongate and slightly curved. Collyer (1953) figured the eggs of *reuteri* Saunders and *tiliae*. The ova of *longipennis* Flor and *tiliae* are described by Butler (1923). Oviposition sites have not been reported for any Nearctic species of *Phytocoris*. In England, *tiliae* oviposits in the wood of deciduous trees such as apple, ash, lime, and oak (Collyer, 1953). *Phytocoris ulmi* (L.) inserts its eggs into the bark of trees and shrubs, and *varipes* oviposits in the stems of grasses and herbaceous plants (Southwood and Leston, 1959). In western North America, oviposition may occur as early as February or

March for species inhabiting arid regions, or as late as October for montane species.

Phytocoris species pass through five nymphal instars before reaching the adult stage. Nymphs usually have a mottled color pattern (which may differ from that of the adult) and hold the large hind femora nearly vertical when stationary. The last nymphal instars of several Nearctic and Palearctic species were described by Butler (1923), Wheeler and Henry (1977), and Cooper (1981). Butler (1923) described all five instars of the Palearctic species *ulmi*. Fifth instars have been illustrated by Wheeler and Henry (1977) and Cooper (1981). Kullenberg (1944) provided a color illustration of *varipes*, a Palearctic species which has been introduced into western Oregon. Little information is available on the time required for nymphal development. Cooper (1981) reported a fourth nymphal stadium of three to four days and fifth nymphal stadium of six to seven days for *neglectus* reared at 24°C. Males usually mature before females with females sometimes being the only sex encountered in late season collections.

The genus is assumed to comprise predominantly predaceous species, but few direct observations or detailed studies of feeding habits have been made. Several Palearctic species were reported to be predaceous by Southwood and Leston (1959) and Wagner (1970–71). Small, soft-bodied insects such as aphids, psocids, psyllids, scales, and early instar lepidopteran larvae seem to be the preferred prey of most species. Mites also have been reported as prey (Collyer, 1953; Wheeler and Henry, 1977). In North America, predaceous species or probable predators have been reported by Knight (1920, 1941), Wheeler and Henry (1977), and Kelton (1980). *Phytocoris tricinclipes* is the only predaceous species listed by Knight (1968) in his review of western North American species. Cooper (1981) observed nymphs and adults of *neglectus* feeding on live dipteran larvae and aphids in laboratory tests.

Several species of *Phytocoris* have been identified as predators of pests in forests and orchards. *Phytocoris reuteri*, *tiliae*, and *ulmi* all are reported as predators of red spider mite, *Metatetranychus ulmi* (Koch), in England (Collyer, 1953; Southwood and Leston,

1959). Turnock (1953) observed *neglectus* feeding on eggs and newly hatched larvae of the larch sawfly in Saskatchewan and speculated that this species and other mirid predators may be fairly important in natural control. Ives (1967) reported an undetermined species of *Phytocoris* as an egg predator of larch sawfly. In caged tests, Ives found that nymphs of this predator consumed an average of 1.5 eggs per day and adults, 2.9 eggs per day. Martin (1966) found a correlation between declines in populations of the aphid, *Schizolachnus pini-radiata* (Davidson), on *Pinus resinosa* Aiton and increased numbers of *Phytocoris eximius* Reuter (misidentified—probably *canadensis* Van Duzee). LeRoux (1960) reported *conspurcatus* as an important predator of apple aphid, *Aphis pomi* DeG., in Quebec, and Denton (1979) listed an undetermined species of *Phytocoris* as a predator of larch casebearer larvae in western larch forests. Fichter (1982: personal commun.) has shown that nymphs and adults of *calli* and *nigrifrons* are predators of early instar douglas fir tussock moth larvae in white fir forests of northern California. In enzyme-linked immunosorbent assay tests (ELISA), Fichter obtained between 47 percent and 87 percent positive results for *nigrifrons* collected at three different localities. This species continued to test positive for tussock moth even when moth densities were extremely low (less than one larvae per 0.65 m² of foliage). Gut (1982: personal commun.) found an undetermined species of *Phytocoris* (nr. *conspurcatus*) to be one of the most abundant predators of scales and pear psylla nymphs on pear trees in southwestern Oregon. Although the regulatory capabilities of *Phytocoris* predators in forests and orchards require further investigation, existing studies and observations indicate that some species may play an important role in natural control of insect pests.

Several species of *Phytocoris* are reported to be at least partially phytophagous. Southwood and Leston (1959) reported that *varipes* feeds mostly on unripe fruits and flowers of small plants and probably on small insects as well. In Oregon, I have observed this species feeding on seed heads of grasses at night. The Palearctic species, *ulmi*, is reported to be partially phytophagous, feeding on unripe fruits,

buds, and young leaves of various plants (Southwood and Leston, 1959). Wagner (1970–71) reported several other phytophagous species from the Mediterranean region. In North America, *junipericola* Knight has been suggested to be phytophagous (Knight, 1927c; Wheeler and Henry, 1977). I have observed several western species probing plant tissues but could not determine if feeding was actually taking place. The occurrence of mixed feeding in some species of *Phytocoris* is unexplained and requires further investigation. Razafimahatratra (1980) speculated that partial phytophagy in the predaceous genus *Deracoris* may be a means of recognizing breeding hosts in species where hatching of eggs must coincide with the appearance of host-specific prey populations. It also is possible that plant nutrients are important dietary constituents even in species that are predominantly predaceous. Of course it is important to recognize the difference between simple probing of plant tissues and actual feeding. Wheeler and Henry (1977) suggested that probing is a part of the searching behavior of *breviusculus*. Probing without feeding also may be related to some other aspect of behavior.

Phytocoris species inhabit a wide variety of trees and shrubs. In some floristic associations, a different *Phytocoris* species can be found on nearly every woody plant species. A few species occur on grasses and herbaceous plants. The host plant associations of western North American taxa are given in the Discussion section of the species treatments. Because the host plants of many species are still poorly known, I have included all available host records, realizing that some of these may be only incidental. In many cases, available records show that related species inhabit similar host plants. For example, members of the *fraterculus* and *juncus* species-groups are restricted to plants belonging to the family Pinaceae. Several species-groups, however, are composed of members that inhabit unrelated plants. Until the host plants of western species are better known, one can only speculate with regard to general patterns of host utilization, and correlations between host association and phylogeny.

The degree of host plant specificity is ex-

tremely variable in the genus *Phytocoris*. The majority of western species seem to be restricted to a single host plant or several related plants, but some species are regularly collected from two or more unrelated hosts. The degree of specificity may be a function of preference for prey. Species with preferred diets would be restricted to plants offering the appropriate prey, while more generalized predators could inhabit many plants by feeding on different species of prey. Of course a specialized predator could inhabit more than one plant species if its preferred prey occurred on more than one host. Phytophagous species also are variable regarding host plant specificity. For example, *varipes* inhabits and feeds on a variety of herbaceous plants (Southwood and Leston, 1959), while *juni-pericola* is apparently restricted to plants belonging to the cypress family (Wheeler and Henry, 1977). Species showing little host plant specificity, whether phytophagous, predaceous, or mixed feeders, are often more easily associated with a particular type of habitat or floristic association than with specific plants.

Some host plants support multiple species of *Phytocoris* simultaneously. In many cases, co-occurrence appears to be the result of resource partitioning, whereby different species occupy different parts of the host plant (e.g., cones, foliage, branches, bole). In western North America, I have observed co-occurrence in closely related species as well as in taxa that appear to be only distantly related. A case of co-occurrence of two unrelated species was observed for *fraterculus* and *stellatus* on *Pinus contorta* Dougl. throughout much of the Cascade Range in Oregon and Washington. Although these species occur together during most of the season, they are actually well separated spatially because *fraterculus* is a bark-inhabiting species while *stellatus* seems to be restricted to the foliage and needle bases. A similar situation between the related species *fraterculus* and *jucundus* occurs throughout much of California, Oregon, and Washington on *Pinus ponderosa* Dougl. In some cases it seems that co-occurring species occupy the same part of the host plant. Cooper (1981) found such a situation for two bark-inhabiting species, *neglectus* and

nobilis, on *Abies procera* Rehder in Oregon. After careful study, Cooper discovered that these species were actually isolated temporally and occurred together only for a brief period in mid-August. Temporal isolation may reduce competition between species with similar ecological and biological requirements. However, some species of *Phytocoris* that are not broadly separated spatially or temporally may coexist on the same host plant because of slight differences in microhabitat, food preference, and/or behavior.

Reference has been made in this and other sections to "bark-inhabiting species." Bark appears to be a very common habitat for *Phytocoris*, possibly more so than foliage. Bark-inhabiting species have been identified in the literature by Knight (1920, 1941), Southwood and Leston (1959), Wagner (1970–71), Wheeler and Henry (1977), and others. The dark, mottled color pattern of these species blends well with the bark making them nearly invisible when at rest. Cooper (1981) found that the greenish white and fuscous coloration of *nobilis* was very similar to the color of lichens on the bole and branches of trees inhabited by this species. Bark-inhabiting species undoubtedly feed on soft-bodied insects and mites associated with the bark. I have observed and collected many species of *Phytocoris* directly from the bark of trees and shrubs in western North America (e.g., *corticola*, *dumicola*, *fraterculus*, *populi*, *tiliae*). Other species are assumed to be bark inhabitants because they are collected in greater abundance on twigs and large branches away from the foliage.

Many species of *Phytocoris* have nocturnal habits, as evidenced by the large number of species that are attracted to light. Approximately half of the species in western North America have been collected at night lights. Species inhabiting arid regions are more likely to be attracted to light, and males are more commonly collected than females. Many species that are attracted to light can be collected with little effort from their respective host plants at night. These same plants often yield few to no specimens even with intense collecting during the day. Although the diurnal habits of nocturnal species are not known, it is possible that they retreat to the base of

the host plant or to nearby ground litter to avoid desiccation and possibly higher wind speeds during arid daylight hours.

No predators or parasites of *Phytocoris* were observed in this study. Leston (1961) listed *reuteri* and *ulmi* as hosts of Braconidae in Great Britain. *Peristenus dumestris* Loan is a known braconid parasite of an undetermined species of *Phytocoris* in Ontario, Canada (Loan, 1974).

TAXONOMIC CHARACTERS

The characters discussed below are those found to be most useful in differentiating species-groups and species of *Phytocoris* in western North America. External characters are from adult specimens of both sexes; genitalic characters were examined only for males. Measurement and ratio values are given as ranges based on 5–10 specimens when available.

TOTAL LENGTH OF BODY: The total length is measured from the tip of the tylus to the apex of the hemelytral membrane, or in brachypterous specimens, to the apex of the abdomen. The measurement is taken in dorsal view. Length varies greatly between species (3.3–10.4 mm), and is sometimes useful for distinguishing species or species-groups.

TOTAL WIDTH OF BODY: Measured as the maximum width across the hemelytra in dorsal view. This measurement is of little taxonomic value due to variation in the resting position of the hemelytra.

HEAD: The morphology of the head is particularly useful in distinguishing species-groups. Measurements and ratios display little intraspecific variation and, in conjunction with other characters, will aid in the separation of some species.

Width across eyes: maximum width between the lateral margins of the eyes in dorsal view.

Width of vertex: minimum width between the inner margins of the eyes in dorsal view.

Dorsal width of eye: maximum width between the inner and outer margins of the eye in dorsal view.

Eye length: measured as the maximum length (height) of the eye in lateral view.

Eye width/width of vertex: this ratio is use-

ful in separating some species in groups with large eyes.

Eye length/width of vertex: this ratio is particularly useful in recognizing several species-groups in which the members have small eyes and broad vertices.

Head shape: The shape of the head is quite variable within the genus. Three basic head shapes are recognized for descriptive purposes: elliptical, subquadrate, slightly elongate. However, because head shape is determined by a number of characters, all of which show variation, it is sometimes difficult to recognize a particular head as belonging to one of these categories. The situation is further complicated by head types that are somewhat intermediate with regard to these categories, and by variation in head shapes within some species-groups.

Frons: weakly to strongly convex; usually evenly arched, but sometimes abruptly deflected distally, especially in species with elongate heads; meeting tylus along narrow to broad, shallow, or deep depression.

Tylus: weak to prominent, base sometimes strongly produced anteriorly of frons; usually of even thickness but sometimes tapering distally.

Size and shape of eyes: Eye size varies greatly between species. Shape ranges from elliptical to obovate or subspherical. The posteroventral margin of the eye in lateral view is sometimes slightly arcuate giving the eye a reniform appearance. The eyes of some species are closely appressed to the head, but more often they are moderately to strongly protuberant.

Coloration: The ground color is usually white or pale yellow. The bucculae, lora, juga, tylus, and frons are usually lightly to heavily marked or tinged with red to fuscous. The striae on the frons are usually darkened.

ROSTRUM: The length is measured from the junction of the epipharynx and tylus to the apex of the fourth segment. Rostrum length is extremely variable between species, and sometimes shows considerable intraspecific variation in the members of some species-groups. The relative position of the tip when it is parallel to the long axis of the body will distinguish some species. The tip extends from between the mesocoxae in some species to

beyond the anterior margin of the ninth abdominal segment in others.

ANTENNAE: The length of segment I is measured from the middle of the basal constriction to the apex. Lengths of segments II–IV are maximum measurements. The length of segment I is less variable than that of other segments. The following ratios are particularly useful for distinguishing species: length of segment I to width of head across eyes; length of segment I to posterior width of pronotum; length of segment II to posterior width of pronotum. Segment I is linear, sometimes slightly enlarged on one or both ends, or rarely uniformly thickened. Segments II–IV are linear. The density and length of bristlelike setae on segment I are useful in separating some species, as is the color pattern of this segment. The general coloration of the antennae and banding patterns on segments II and III are particularly useful in distinguishing species and for the recognition of some species-groups. Segments II and III usually have a pale annulus at the base. Segment II sometimes has a narrow to broad, pale annulus medially.

PRONOTUM: The posterior width of the pronotum is measured as the maximum distance between the posterolateral angles. Length of the pronotum is taken on the midline from the anterior margin of the pronotal collar to the posterior margin of the disk. The shape of the pronotal disk is trapezoid or subconical. The disk is weakly to strongly convex, and usually evenly arched, or sometimes rising more abruptly posteriad of the calli. The shape, size, and convexity of the disk are of limited use in distinguishing species. The surface texture of the disk is smooth or finely roughened, but without distinct punctures. The presence of 4–6 weakly to moderately developed bullae on the posterior submargin of the disk is diagnostic for some species-groups. The calli are distinct but vary in shape, size, and convexity. The depth of the depression behind the calli is useful for distinguishing some species. The junction of the disk and propleuron is rounded, or rarely weakly marginate or carinate anteriorly. The color pattern of the propleuron is sometimes useful in differentiating species. The scutellum is weakly to strongly

convex and may be declivous or abruptly deflexed apically.

HEMELYTRA: The embolar margin is straight or slightly rounded. Color patterns of the hemelytra are variable within and between species. Once the range of variation is known, hemelytral coloration can be of value in distinguishing species or groups of species. Individuals are either macropterous, submacropterous, or brachypterous. The hind wing and membrane of the forewing are greatly reduced in brachypterous specimens. The density and distribution of dark markings on the membrane are useful for distinguishing some species.

LEGS: The color patterns of the femora vary greatly between species and provide good diagnostic characters at the species-group level. Color patterns are more stable within species, but color intensity is sometimes variable. The number of dark annuli on the front and middle tibiae and the width of the bands will distinguish some species and species-groups. The length and thickness of simple setae on the legs, and the color of the tibial spines are sometimes useful in distinguishing species. The relative lengths of the tarsal segments are diagnostic for several species-groups. The tarsal claws are slightly to moderately curved. Pulvilli are present but small.

GENERAL COLORATION: Different degrees of interspecific and intraspecific color variation are evident. Once the range of variation is known, coloration characters can be of value in delimiting species or groups of species. Color patterns are usually less variable than color intensity, but both characters have application at the species and species-group levels. See the previous sections for discussions of the utility of general coloration and color patterns in relation to specific areas of the body.

VESTITURE: The type, density, and fine structure of setae on the dorsum are valuable characters for distinguishing species-groups and species. All *Phytocoris* species have two types of setae on the dorsum: (1) light or dark, suberect or rarely erect, simple setae; and (2) recumbent, silvery white, sericeous (wooly) or scalelike setae. Some species also have narrow to broad, dark scalelike setae on the dorsal surface. The fine structure of sericeous and

scalelike setae varies considerably between species-groups. Sericeous setae are usually symmetrical with a discernible midrib and apically converging ridges of variable width, elevation, and spacing. These setae are usually slightly flattened with two distinct surfaces, but in some cases appear to have three or possibly four surfaces (triangular or quadrate in cross-section). Sericeous setae are always acute apically. Broader scalelike setae are always strongly flattened with an acute to broadly truncate or sometimes coarsely serrate apex. Scalelike setae are usually asymmetrical with evenly spaced, oblique to nearly parallel, entire ridges, or sometimes with highly dissected or pustulate, irregular ridges. The setal types are usually evenly intermixed on the dorsum, but the relative densities of different types vary. In some species, the silvery white, sericeous setae on the hemelytra are arranged in clusters. The venter is sparsely to moderately clothed with simple setae and sometimes has sparsely distributed sericeous setae or rarely, more densely arranged, closely appressed, scalelike setae. Because of the relative ease with which specimens lose their vestiture, especially scalelike setae, it is sometimes necessary to examine a number of individuals to determine setal types. Although setal type and density can be determined with a light microscope, aspects of the fine structure must be investigated with a scanning electron microscope.

MALE PARAMERES: The genital parameres offer some of the most stable and useful characters for distinguishing species and species-groups. The parameres display little intraspecific variation and are invaluable for the recognition of closely related species. The terminology followed here is that of Kelton (1959) with some modification. The regions of the left paramere are: arm (region between basal attachment and angle); sensory lobe (variously developed dorsal region of arm); angle (curved, angle-bearing region of paramere); shaft (remaining portion of paramere beyond angle); and the apex. The left paramere is moderately to strongly curved with a variously developed sensory lobe. The dorsal surface of the arm between the sensory lobe and the angle is rarely produced into a

spinelike, angulate, or large knoblike process. The arm and base of the shaft are sometimes set with spines or tubercles. The shaft is subcylindrical or slightly flattened laterally with the preapical region usually noticeably expanded in dorsal view. The apex is truncate, narrowly rounded, or rarely acute. The right paramere is of lesser taxonomic value. It is usually elongate or narrowly to broadly lanceolate, but sometimes more complex and with distinct basal and apical regions. The right paramere is sometimes set with spines or tubercles on the inner or dorsal surface. The apex is blunt or acute.

VESICA: Figures 1–6. This structure is of great taxonomic value at the species and species-group levels. The terminology is that of Kelton (1959) with some modification. In *Phytocoris* the vesica is a lobate, membranous sac usually with one or more sclerotized appendages or rows of heavy spines. The base of the vesica usually has a small membranous lobe originating laterally on each side of the ductus seminis. These are referred to as the “basal lobes” to distinguish them from the large membranous sac (primary sac) that occupies the region behind and above the ductus seminis. The basal lobes and primary sac are confluent basally. The primary membranous sac is usually multilobed, but unilobed or bilobed sacs occur in some species-groups. The lobes vary in size and shape, and may have smaller accessory lobes, patches of spinulae, or weakly sclerotized regions. The term “basal process” is used here to refer to the small, straplike sclerite which originates posteriorly of the base of the expanded apical region of the ductus seminis. This structure is lightly to heavily sclerotized, and usually extends to or slightly beyond the level of the gonopore. The basal process is broadly attached to the primary membranous sac and may function to support the posterobasal region of the inflated vesica. Schwartz (1987) referred to the basal process, as defined here, as the “basal sclerite.”

The sclerotized appendages associated with the lobes of the vesica vary greatly in number, shape, and extent of attachment. Many of these structures appear to be simple outgrowths of the membrane cuticle, but others originate near the apex of the basal process



Figs. 1–6. Vesicae of *Phytocoris* species. 1. *calli*. 2. *ingens*. 3. *arizonensis*. 4. *calli*, lateral view with membranous portions omitted. 5. *sewardi*. 6. *insulatus*. BP, basal process; DS, ductus seminis; LBL, left basal lobe; LS, lobal sclerite; LSP, left sclerotized process; PMS, primary membranous sac; RBL, right basal lobe; RSP, right sclerotized process; SG, secondary gonopore; SP, sclerotized process; SS, sclerotized strap of PMS.

and in some cases seem to be distal prolongations of this structure. Kelton (1959) used the terms sclerite, sclerotized process, and spiculum in referring to the sclerotized struc-

tures of the vesica in the tribe Mirini. However, the terms were used interchangeably by Kelton with no apparent attempt to define homologous structures. Clayton (1982) dif-

ferentiated several types of vesical appendages in the genus *Lygocoris* Reuter. In the present study, two types of vesical appendages are distinguished: (1) *sclerotized processes*—originating at or near the level of the gonopore, continuous with or narrowly removed from the basal process, variously attached to the primary membranous sac of the vesica; (2) *lobal sclerites*—originating at or near the periphery of the membranous lobe, always simple outgrowths of the membrane cuticle. In a broad ranging study of mirine vesical appendages, Schwartz (1987) noted that the basal process and sclerotized process are usually contiguous or only narrowly separated. Since the two structures were often difficult to differentiate, he chose to refer to them collectively as the “ribbonlike strap,” using the term “sclerotized process” only for those appendages which did not have a clearly defined basal region (i.e., basal process) or when two or more appendages were present (other than lobal sclerites) in addition to a ribbonlike strap, but without basal attachment to the strap. Schwartz (1987) also recognized that the “spiculae” of Clayton (1982) are a specialized type of ribbonlike strap. In *Phytocoris* the basal process is usually expanded distally and narrowly separated from the base of the sclerotized process. Since two structures are usually easily recognizable, they are maintained as such in the present study, even though the examination of other mirine genera (Schwartz, 1987) indicates that they are often one in the same structure. In several instances, it was difficult to distinguish between sclerotized processes and lobal sclerites. This was particularly true of taxa with greatly reduced primary membranous lobes and/or those with multiple sclerotized appendages (e.g., *cunealis* group species). When such uncertainty existed, the structure in question was always given the term “sclerotized process.”

All characters of the membranous lobes and sclerotized appendages of the vesica are useful in distinguishing species-groups and species. References to these characters (e.g., left vs. right, basal vs. distal) are made from dissected preparations of the vesica with the gonopore facing upward and the primary membranous sac oriented away from the observer (figs. 1–6). In many cases, the vesica will not fully inflate during preparation, mak-

ing the comparison of membranous structures difficult. In general, the number, relative size and shape, and position of the primary membranous lobes can be adequately determined in uninflated or partially inflated specimens, as can all characters of the sclerotized appendages. Viewing of membranous portions of the vesica is greatly improved by brief exposure of rinsed dissections to Chlorazol Black E suspension in 50 percent alcohol. If the vesica does not inflate, it must be pulled out of the phallosome with a pair of fine forceps. Care must be taken not to damage the sclerotized appendages during this procedure. When the vesica does not fully inflate, it is usually necessary to manipulate the lobes or change the position of viewing slightly to obtain a clear view of the sclerotized processes. Sclerotized processes are illustrated in a position which conveys the most structural information. Some repositioning of dissected material may be necessary to obtain the configurations in the illustrations.

SPECIES-GROUPS

No comprehensive studies have been made of species relationships in the genus *Phytocoris*, but several workers have defined infrageneric groups at the regional level. In western Europe, the genus has been divided into 10 subgenera, distinguished primarily on head morphology, color patterns of the hemelytra and antennae, and characters of the male genitalia (see Wagner, 1970–71 and references cited therein). Although these subgenera appear to be monophyletic, their applicability outside the Palearctic region is limited. For example, Carvalho and Gomes (1970) found that the diagnostic characters of the subgenera do not define monophyletic groups when applied to Neotropical species. Likewise, the Nearctic species of *Phytocoris* do not conform to the proposed subgeneric classification. Many species cannot be placed in any of the available subgenera, and closely related species are frequently relegated to different groups. The Palearctic subgenera of *Phytocoris* would have been more appropriately defined as species-groups, since they are based only on characters of European species and have limited application in other parts of the world.

A number of species-groups have been de-

finer for Nearctic species of *Phytocoris*. Knight (1923) divided the species of eastern North America into four large groups based on color patterns of the hemelytra and antennae, the length of antennal segment I, and the structure of the sclerotized appendages of the vesica. With the exception of "Group I," these groups are quite homogeneous and appear to be monophyletic. Group I is more of a convenience group and seems to contain a number of unrelated species. Knight (1968) recognized five species-groups for western North American species of *Phytocoris*, all of which are distinctly polyphyletic. The banding patterns on the second antennal segment, used almost exclusively by Knight to distinguish his western species-groups, are useful for species recognition but have limited value for determining natural assemblages of species.

In the present study, 199 western North American species of *Phytocoris* are divided into 20 species-groups. These groups range in size from 3 to 26 species. A diagnosis and a description of each species-group are provided in the Systematics section. A brief discussion of host-plant associations, distribution, and suggested relationships with other species-groups is given in each group Discussion section. With the exception of the *plenus* species-group, all groupings recognized in the present study are strongly supported as monophyletic. Characters most useful in defining species-groups are those of the head and its appendages, the dorsal vestiture, and the male genitalia. The synapomorphies of a particular group, as well as other useful diagnostic characters, are given in the group diagnosis. A strict listing of synapomorphies for each species-group is provided in the Appendix. Some species lack one or more characters that are synapomorphic for the group. While these homoplasies sometimes complicate group recognition, most taxa are easily placed upon examination of the diagnostic genitalic features. Some species could not be satisfactorily placed in any of the proposed species-groups. These taxa are grouped at the end of the Systematics section under the heading "Species with uncertain group affiliation." The *plenus* group is not monophyletic, having no synapomorphies that apply to all members of the group

collectively. It is a convenience group whose members are recognized primarily by similarities in coloration, head structure, and dorsal vestiture, some of which appear to be symplesiomorphic. Based on structures of the male genitalia, the "*plenus* group" can be divided into four monophyletic subgroups, but only two of these appear to be closely related (see further discussion under *plenus* group treatment).

A preliminary cladistic analysis of the 20 species-groups recognized here (excluding the *carosulus* group) was conducted by Stone-dahl (1983b). Forty-four characters of the external morphology and male genitalia were subjected to analysis using the Wagner 78 maximum parsimony program developed by Dr. J. S. Farris, State University of New York, Stony Brook. That analysis must be viewed as tentative, since it incorporates only western North America taxa, which as a whole may not be a monophyletic group. Other Nearctic species (i.e., eastern North American, Mexican) would certainly fit within the limits of the phylogeny proposed by Stone-dahl (1983b: 461) and could substantially alter the hypothesized relationships. Further, the selection of *Creontiades* Distant as the sole outgroup of the analysis was inappropriate, since the relationship of this and other genera to *Phytocoris* is not clearly established (see generic discussion). Clearly, a study of relationships at the species-group or subgenus level for *Phytocoris* cannot be adequately performed until the genus is more completely studied on a worldwide basis, and more is known regarding the relationships of mirine genera.

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MUSEUM ABBREVIATIONS

AMNH	American Museum of Natural History, New York
ASU	Arizona State University, Tempe
BYU	Brigham Young University, Provo, Utah

CAF&A	California Department of Food and Agriculture, Sacramento	SHF	Schaffner Collection, College Station, Texas
CAS	California Academy of Sciences, San Francisco	SMNH	Swedish Museum of Natural History, Stockholm
CNC	Canadian National Collection, Agriculture Canada, Ottawa	TA&M	Texas A&M University, College Station
CSU	Colorado State University, Fort Collins	UAZ	University of Arizona, Tucson
JTP	Polhemus Collection, Englewood, Colorado	UBC	University of British Columbia, Vancouver, Canada
KU	Snow Entomological Collection, University of Kansas, Lawrence	UCB	University of California, Berkeley
LACM	Los Angeles County Museum of Natural History, California	UCD	University of California, Davis
MSU	Montana State University, Bozeman	UCR	University of California, Riverside
NAU	Northern Arizona University, Flagstaff	UID	University of Idaho, Moscow
NMS	New Mexico State University, Las Cruces	USNM	United States National Museum of Natural History, Washington, D.C.
OSDA	Oregon State Department of Agriculture, Salem	USU	Utah State University, Logan
OSU	Oregon State University, Corvallis	WWU	Western Washington University, Bellingham
SDNH	San Diego Natural History Museum, California	ZMH	University Zoological Museum, Helsinki, Finland

SYSTEMATICS

Genus *Phytocoris* Fallén

Phytocoris Fallén, 1814: 10 (type species *Cimex populi* Linnaeus, 1758: 449; fixed by Westwood, 1840: 12).

Pallacocoris Reuter, 1876: 62 (type species by monotypy *suavis* Reuter). NEW SYNONYMY.

Compsocercocoris Reuter, 1876: 70 (type species by monotypy *annulicornis* Reuter; syn. by Reuter, 1909: 14).

Dionyza Distant, 1891: 113 (type species by monotypy *variepata* Distant; syn. by Carvalho, 1952: 91).

Callodemus Uhler, 1895: 33 (type species by monotypy *laevis* Uhler; syn. by Reuter, 1909: 14).

Ecertobia Reuter, 1909: 36 (type species by monotypy *decora* Reuter). NEW SYNONYMY.

DIAGNOSIS: *Phytocoris* is distinguished from other genera of the tribe Mirini by the following combination of characters: lorum moderately to strongly swollen; antennae long, cylindrical, segments linear or nearly so; dorsal coloration usually mottled; pronotum and hemelytra without distinct punctures; dorsal vestiture with two or three types of setae; hind femora long, usually reaching beyond apex of abdomen, slightly to moderately flattened, broadest near bases, slightly to strongly tapered distally; genital capsule usually with tubercles above paramere bases; shaft of left paramere slightly to greatly expanded distally

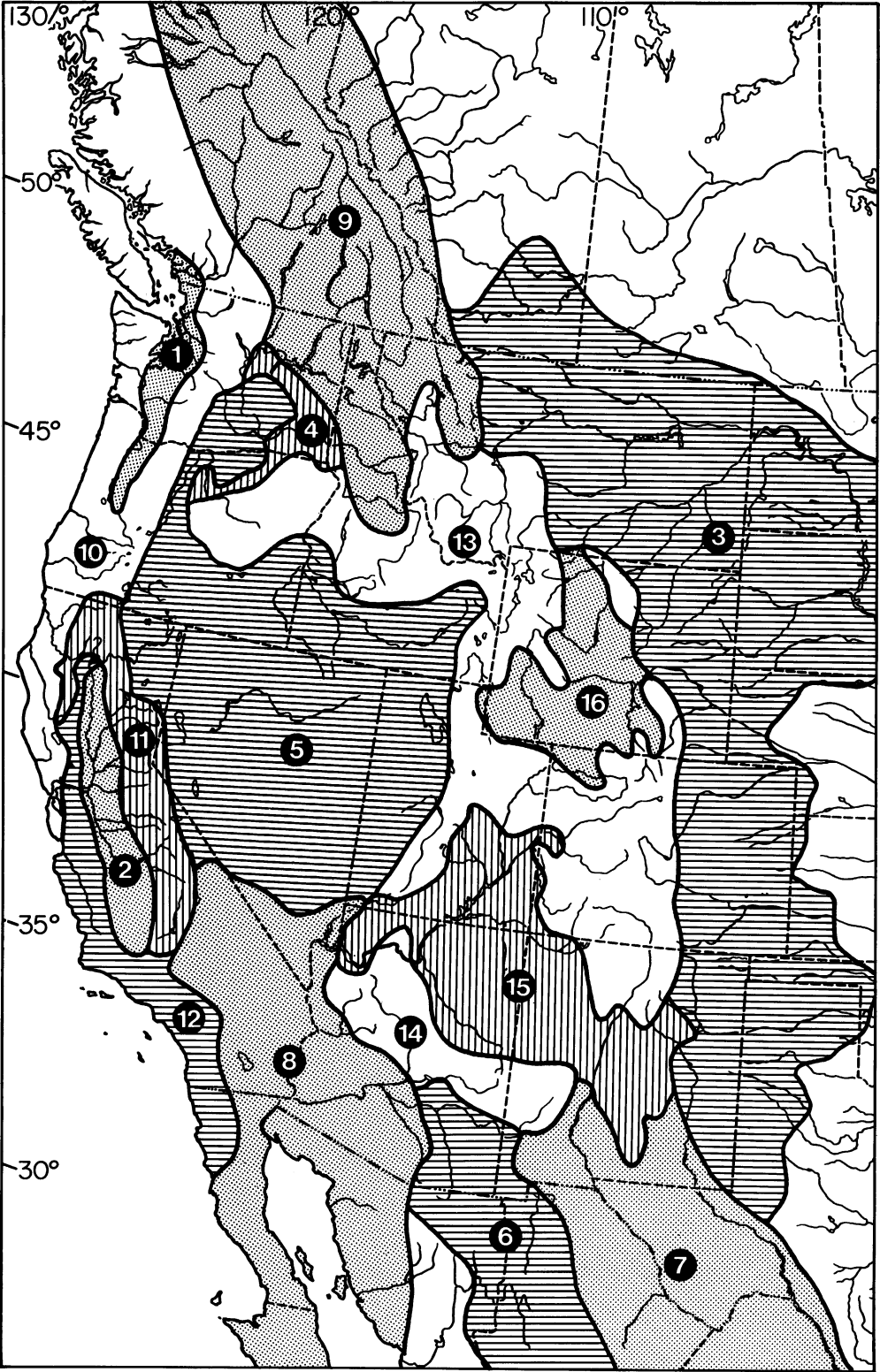
in dorsal view; right paramere narrowly to broadly lanceolate, sometimes more complex; vesica with one or more primary membranous lobes, basal process and sclerotized processes well developed, ductus seminis usually constricted medially.

Although the above set of characters defines a readily recognized subset of species within the Mirini, there is some question as to the monophyly of this group. The heterogeneity in external and genitalic characters is so great on a worldwide scale that the inclusion of all species within the limits of one genus tends to distort the generic concept of *Phytocoris* relative to that of other Mirini genera. Even in the Nearctic region there are some species of *Phytocoris* which may eventually be more appropriately placed in other genera. In the present study, all species are maintained in the genus *Phytocoris*, with the recognition that some alteration may be necessary in the classification of western Nearctic species when the phylogenetic relationships of the genus are better known on a worldwide scale.

DESCRIPTION: Small to large, 3.3–10.4 mm, variously colored and marked, with color pattern on hemelytra and legs usually mottled; body suboval or elongate; dorsal surface smooth or finely roughened, impunctate; fe-

males sometimes submacropterous or brachypterous. **Vestiture:** dorsum with light or dark, suberect, simple setae and recumbent, silvery white, sericeous, or scalelike setae; sometimes also with narrow to broad, dark, scalelike setae; venter sparsely to moderately set with appressed or upright simple setae, sometimes also with sparsely distributed sericeous setae or rarely more densely set with closely appressed, pale, scalelike setae. **Head:** elliptical, subquadrate, or slightly elongate in lateral view; without basal carina; frons weakly to strongly convex, sometimes abruptly deflexed apically, meeting tylus along shallow to deep depression; frons sometimes with dark striae laterally; tylus prominent; vertex narrow to broad, usually with row of transverse, bristlelike setae; eyes subspherical, elliptical, or obovate, sometimes slightly reniform, at level of or slightly removed from posterior margin of head; lora moderately to strongly swollen. **Rostrum:** length variable, reaching from between mesocoxae to ninth abdominal segment. **Antennae:** long, cylindrical, coloration and markings variable; inserted at or below line drawn through middle of eye; set with short, fine, reclining or suberect setae; segment I variable in length, sometimes thicker at one or both ends, or rarely uniformly thickened, sparsely to moderately clothed with erect or suberect bristlelike setae; segments II–IV linear; segments II and III sometimes with pale annulus at base; segment II sometimes with pale, median annulus. **Pronotum:** disk trapezoidal or slightly conical, weakly to moderately convex, usually evenly arched but sometimes rising more abruptly behind calli; anterior angles broadly rounded; lateral and posterior margins straight or slightly to moderately arcuate, posterior margin sometimes with shallow median notch; posterior submargin of disk sometimes with transverse, fuscous line or 4–6 weakly elevated fuscous points; collar well differentiated, forming a complete ring, usually with transverse series of bristlelike setae; calli distinct, smooth or finely asperate, sometimes narrowly to broadly joined anteriorly, reaching lateral margins of pronotum or nearly so; bordered posteriorly by shallow to deep depression; junction of disk and propleuron rounded, rarely weakly marginate or anteriorly carinate; mesoscu-

tum narrowly to broadly exposed, gradually or steeply sloping to scutellum; scutellum weakly to strongly convex, declivous or abruptly deflexed apically. **Hemelytra:** variously colored and marked; lateral margins subparallel or weakly rounded; embolium prominent; cuneus elongate, usually slightly deflected; apex of clavus and small patch bordering membrane above and below cuneal fracture with tuft of stout, bristlelike setae; membrane conspurcate, or mottled with pale brown to fuscous, rarely uniformly infuscated, sometimes slightly abbreviated, or in brachypterous females reduced to narrow flap. **Legs:** long; hind femora usually reaching beyond apex of abdomen, slightly to strongly flattened, broadest basally, tapered distally; variously colored and marked, femora often with mottled or reticulate pattern; tibiae sometimes with alternating light and dark annuli; femora and tibiae with reclining or suberect, simple setae, and sometimes with sparsely distributed, erect, bristlelike setae, rarely also with long, fine, erect, pale setae; tibiae with four rows of suberect, light or dark bristles, ventrolateral two rows restricted to apical half to two-thirds of segment; dorsal surface of tibiae with scattered, minute, black or rarely pale spinulae; tarsal segments broadly overlapping, length of segment I usually less than segment II but sometimes equal to or greater than II, segment III usually longer than segments I or II; claws slightly to moderately curved; pulvilli present but small; parempodia lamellate and diverging. **Male genitalia:** genital capsule with or without tubercles above paramere bases. *Left paramere:* moderately to strongly curved; sensory lobe weak to prominent; dorsal surface of arm between sensory lobe and angle sometimes with spinelike, angulate, or knoblike process; arm and base of shaft sometimes with spines or tubercles dorsally; shaft subcylindrical or flattened laterally, usually expanded distally in dorsal view; apex truncate or narrowly rounded, rarely acute. *Right paramere:* size and shape variable, usually smaller than left paramere; elongate, or narrowly to broadly lanceolate, rarely more robust; sometimes with spines or tubercles on inner or dorsal surface; apex acute or blunt. *Vesica:* primary membranous sac unilobed, bilobed, or multilobed; lobes variable in size and shape,



sometimes with smaller accessory lobes, or with weakly sclerotized or spinose regions, rarely with apical or subapical lobal sclerites; basal lobes usually well developed; basal process lightly to heavily sclerotized, sometimes obsolete, usually extending to level of gonopore or slightly beyond; vesica usually with 1 sclerotized process but sometimes with 2–4 processes, size and shape of processes variable, usually originating near level of gonopore, sometimes continuous with apex of basal process, variously attached to membranous portion of vesica; ductus seminis expanded apically, usually constricted medially or preapically; gonopore well developed.

DISCUSSION: The nominal genera *Ecertobia* Reuter and *Pallacocoris* Reuter are proposed as new synonyms of *Phytocoris*. The type species of these monotypic genera, *E. decora* and *P. suavis*, possess no unique features that would warrant their recognition as distinct genera, especially given the range of structural variation seen in *Phytocoris*. *Ecertobia decora* is here grouped with four additional species to form the *listi* species-group. Externally these taxa are very similar to members of the *carnosulus* group, but the male genitalia suggest a close relationship with the *junceus* and *plenus* groups and more distantly the *stellatus* and *interspersus* groups. *Pallacocoris suavis* is clearly a member of the *candidus* species-group, with external and genital features very similar to those of *Phytocoris albidosquamus*, *candidus*, and *squamosus*.

The relationship of *Phytocoris* to other mirine genera is insufficiently known and would require investigation beyond the scope of this study. Kelton (1959) suggested a remote relationship between *Phytocoris* and *Platylygus* Van Duzee based on the structure of the male genitalia. Considering the broad range of structural variation in *Phytocoris* male genitalia and the limited knowledge of homology of the mirine vesical appendages

in general, statements of generic relationship based on features of the male genitalia are of limited value until this character system is more completely studied for the tribe.

Slater (1950) grouped *Phytocoris* with several other Mirini genera (i.e., *Coccobaphes* Uhler, *Garganus* Stål, *Horcias* Distant, *Lygidea* Reuter, *Lygus* Hahn, *Platylygus*, and *Poecilocapsus* Reuter) based on the structure of the female genitalia. This group is characterized by having the posterior wall of the bursa copulatrix with the portion of the B structure that lies between the A structures developed into a flattened disk. Within the group, *Phytocoris* is distinguished by the absence of H structures. Female genitalia were not examined in the present study, so no comment can be made regarding their value for determining interspecific or intergeneric relationships.

The key given by Carvalho (1955: 82) adequately distinguishes *Phytocoris* from other mirine genera based on external morphology only. However, some of the diagnostic external features of *Phytocoris* (e.g., inflated lorae, flattened tapered hind femora, mottled color pattern) are found in other genera of Mirini, such as: *Adphytocoris* Carvalho and Gomes, 1969 (Neotropical); *Alda* Reuter, 1909 (Neotropical); *Creontiades* Distant, 1883 (Cosmopolitan); *Eremobiellus* Reuter, 1895 (Palearctic); *Euphytocoris* Poppius, 1914 (Oriental); *Miridius* Fieber, 1858 (Old World); *Phytocoridea* Reuter, 1906 (Palearctic); *Phytocorisca* Carvalho and Fontes, 1972 (Neotropical); and *Quitocoris* Carvalho and Gomes, 1969 (Neotropical). Most of these genera have limited geographical distributions, and can be distinguished from *Phytocoris* only on a local or regional scale. In some cases, the diagnostic generic characters have not been considered in light of the full range of variation in the genus *Phytocoris*. Even at a regional level the distinction between *Phytocoris* and other genera is sometimes un-

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Fig. 7. Map of Bailey's (1978) ecoregions for western North America. Map numbers 1–16, provinces. 1. Willamete-Puget Forest. 2. California Grassland. 3. Great Plains Shortgrass Prairie. 4. Palouse Grassland. 5. Intermountain Sagebrush. 6. Mexican Highland Shrub Steppe. 7. Chihuahuan Desert. 8. American Desert. 9. Columbia Forest. 10. Pacific Forest. 11. Sierran Forest. 12. California Chaparral. 13. Rocky Mountain Forest. 14. Upper Gila Mountains Forest. 15. Colorado Plateau. 16. Wyoming Basin.

clear. For example, the external features and male genitalia of several Palearctic *Miridius* species closely resemble those of species belonging to Wagner's *Phytocoris* subgenera *Ktenocoris* and *Leptophytocoris*. The *Miridius* species appear to be more closely related to members of these subgenera than are the subgenera to other groups of Palearctic *Phytocoris*. Thus, at least a portion of the genus *Miridius* would be more appropriately recognized as a group within the genus *Phytocoris*. Clearly, any future attempt at an infrageneric classification for *Phytocoris* should include a careful review of *Phytocoris*-like mirines on a worldwide scale.

DISTRIBUTION: Members of the genus *Phytocoris* are found in all major biogeographic regions of the world, with the greatest diversity in warm temperate zones of the Nearctic and Palearctic regions. The genus currently contains over 500 species, many of which have been described within the past 20 years. The number of species known from the Ethiopian and Neotropical regions alone has more than doubled since publication of Carvalho's Catalogue of the Miridae of the World (1959).

In North America, 283 species are now recognized and of these, only six occur in other biogeographic regions. *Phytocoris dimidiatus*, *populi*, *tiliae*, *ulmi*, and *varipes* are introduced Palearctic species and *tibialis* Reuter occurs in both the Nearctic and Neotropical regions. Presently, 199 species are recognized from western North America. Only nine species are known to occur both east and west of the Great Plains: two have been introduced onto both coasts from the Palearctic region; two are broadly distributed on the east coast and across the southern tier of states west to Arizona and Colorado on oak; and five species have transcontinental distributions in southern Canada and the northern United States (e.g., *lasiomerus*, *neglectus*). The last group of species sometimes penetrates deep into the southern reaches of the Cascade Range and Rocky Mountains. A few western species (e.g., *decorus*, *laevis*, *sublineatus*) are distributed east to the Great Plains Shortgrass Prairie, but do not occur beyond the eastern boundary of this important transitional province. Very little material from western Canada was available for study. The few species examined are distributed predominantly in forested regions of

southern British Columbia that are analogous to the Pacific Forest, Columbia Forest, and Rocky Mountain Forest provinces (Bailey, 1978) of the western United States.

Detailed information on distribution is provided in the Discussion section of each species treatment. Species distributions are frequently discussed with reference to the biogeographic provinces of Bailey (1978) (see fig. 7). It is important to recognize that the distributions of many species in western North America are still not fully known. Therefore, detailed comparisons at either the group or species level are sometimes not possible. However, two general trends are evident in the distribution patterns of western *Phytocoris* species. Firstly, species of the same group tend to be distributed predominantly in one to several, often contiguous, provinces. Therefore, distribution patterns at the group level, while broader than most species distributions, are often distinctly regionalized. This trend is not as evident in groups having even a small proportion of widely distributed species. The second trend is that related groups often have similar distribution patterns. For example, the *candidus* and *pulchricollis* groups occur predominantly in the American Desert and Mexican Highlands Shrub Steppe provinces, while the *conspurcatus* and *aurora* groups are distributed primarily in forested provinces of the coastal and Rocky Mountain states. The arid southern provinces of the western United States (i.e., California Chaparral, American Desert, Mexican Highland) show the highest endemism, with some montane species occurring only in one to several isolated mountain ranges of southwestern Arizona and/or southern New Mexico. Great Basin species and most taxa inhabiting forested provinces of coastal and intermountain states are usually more broadly distributed, many times occurring in several contiguous provinces. The strongest biogeographic relationships outside western North America are clearly with other areas of the Nearctic region (i.e., eastern North America, northern Mexico). The western Nearctic fauna also has ties with the Palearctic and Neotropical regions, but an investigation of these relationships must wait until the phylogenetic relationships of *Phytocoris* are better known on a worldwide scale.

KEY TO SPECIES-GROUPS

The following key attempts to discriminate species-groups primarily on the basis of external characters. However, it is sometimes necessary to examine structures of the male genitalia to adequately distinguish externally similar species with different group affinities. Therefore, it is desirable to use male specimens in good condition when working both the species-group key and species keys that follow. Nonteneral specimens with most of their appendages yield the best results.

Because external characters are variable in some species-groups, the following key often results in group subdivision. By dividing the members of a particular species-group into smaller assemblages of taxa, the species-group key is functioning to some extent as a key to species. Knowledge of the composition of these smaller assemblages via the species list that follows the group key will often facilitate more efficient operation of the included species keys. The species-group key also distinguishes taxa that could not be satisfactorily placed in any of the proposed species-groups. These taxa are treated at the end of the Systematics section under the heading "Species with uncertain group affiliation."

1

Vestiture of hemelytra with uniformly distributed, dark brown or black, narrow to broad, scalelike setae mixed with other types of setae (figs. 10, 35, 123, 209) 2

Vestiture of hemelytra sometimes with silvery white or golden, scalelike setae, or rarely with limited, narrow, dark, scalelike setae on cuneus and apical region of corium, but never with uniformly distributed, dark brown or black, scalelike setae 40

2(1) Hemelytra green or yellowish green; cuneus sometimes marked or tinged with red 3

Hemelytra never green or yellowish green 5

3(2) Pronotal disk deep ruby red *pulchellus* group¹

Pronotal disk never deep ruby red ... 4

4(3) Pronotal disk grayish white with fuscous markings, posterior submargin with four tumid points (fig. 264); pronotal collar fuscous; length 6.0–7.0 .. *becki* Knight

Pronotal disk green or yellowish green, posterior submargin without tumid

points; pronotal collar green; length 4.2–5.7 *juniperanus* group²

5(3) Hind femora uniformly dark red to purplish black with scattered pale spots 6

Hind femora sometimes uniformly orange or reddish orange or with limited to moderate red markings mostly restricted to distal half, but never uniformly dark red to purplish black 8

6(5) Antennal segment II reddish brown to fuscous with pale, median annulus ... 7

Antennal segment II brownish yellow, without pale annulus medially *aurora* group³

7(6) Hemelytra uniformly deep wine red; genital capsule of male with prominent tubercle above base of left paramere (fig. 276a); length 4.9–6.2 *vinaceus* Van Duzee

Hemelytra brownish gray with limited darker brown markings; cuneus and outer margin of corium marked with red; genital capsule without tubercle above base of left paramere (fig. 226a); length 4.5–5.3 *rostratus* group⁴

8(5) Venter moderately to densely clothed with closely appressed, pale, sericeous or scalelike setae (figs. 23, 193) 9

Venter without dense mat of appressed, scalelike setae, but sometimes with sparsely distributed sericeous setae 10

9(8) Antennal segment II with pale, median annulus *pulchricollis* group⁵

Antennal segment II without pale, median annulus *candidus* group⁶

10(8) Antennal segment I with dense brush of long, pale setae on ventral surface (fig. 118); length 3.8–5.1 *juniperanus* group⁷

Antennal segment I without dense brush of long, setae on ventral surface ... 11

11(10) Ratio of eye height to width of vertex 0.90: 1 to 1.10:1 for males and 0.80:1 to 1.00: 1 for females 12

Ratio of eye height to width of vertex greater than 1.10:1 for males and greater than 1.00:1 for females 17

12(11) Length of antennal segment I equal to or slightly greater than width of head across eyes—ratio 1.00:1 to 1.10:1 13

Length of antennal segment I greater than width of head across eyes—ratio 1.20:1 or greater 14

13(12) Propleura pale with transverse, fuscous stripe near dorsal margin, pronotal disk

- usually with pale, longitudinal line medially; genital capsule of male with prominent, cylindrical tubercle above base of left paramere (fig. 196a); right sclerotized process of vesica as in figure 196e *pulchricollis* group⁸
- Propleura fuscous with medial stripe and distal third pale; pronotal disk without pale, median line; genital capsule with broad, weak protuberance above base of left paramere (fig. 216a); right sclerotized process of vesica as in figure 216e *rostratus* group⁹
- 14(12) Pronotal disk with pale, longitudinal line medially 15
Pronotal disk without pale, median line 16
- 15(14) Length of male 4.4–6.2; female macropterous or submacropterous, length similar to that of male *rostratus* group¹⁰
Length of male 6.3–8.3; female strongly brachypterous, length 5.2–7.3 *hopi* group¹¹
- 16(14) Vesica of male aedeagus with one sclerotized process—broadly and evenly curved (figs. 83e, 88e), or nearly linear with weakly curved basal and distal regions (fig. 82e); base of sclerotized process unmodified *hopi* group¹²
Vesica with two sclerotized processes—right process narrowed and strongly curved distad of expanded basal region (figs. 210e, 234e), or if right process linear and unmodified basally, then with several coarse serrations distally (fig. 211e); left sclerotized process variable, sometimes with membranous saclike structure apically (fig. 236) *rostratus* group¹³
- 17(11) Body length 3.7–4.6 18
Body length usually greater than 4.6 .. 19
- 18(17) Ratio of length of antennal segment I to width of head across eyes 1.30:1 to 1.40:1 *rostratus* group¹⁴
Ratio of length of antennal segment I to width of head across eyes less than 1.20:1 *juniperanus* group¹⁵
- 19(17) Hemelytra reddish orange or brownish orange; areolar veins red 20
Hemelytra sometimes marked or tinged with red, but never appearing orange 21
- 20(19) Antennal segment II reddish brown to black; genital capsule of male with large tubercle above base of left paramere (fig. 140a) *juniperanus* group¹⁶
Antennal segment II pale yellow or brownish yellow; genital capsule without tubercle above base of left paramere *fraterculus* group¹⁷
- 21(19) Fore tibiae without annuli 22
Fore tibiae with alternating light and dark annuli; dark bands sometimes interrupted by pale spots 25
- 22(21) Ratio of length of antennal segment I to width of head across eyes greater than 1.40:1 *rostratus* group¹⁸
Ratio of length of antennal segment I to width of head across eyes less than 1.30:1 23
- 23(22) Ratio of length of antennal segment II to posterior width of pronotum greater than 1.50:1; genital capsule of male without, or with small, knoblike tubercle above base of left paramere 24
Ratio of length of antennal segment II to posterior width of pronotum less than 1.30:1; genital capsule with long, tapered tubercle above base of left paramere (fig. 44a) .. *conspurcatus* group¹⁹
- 24(23) Hemelytra grayish white with scattered fuscous spots; genital capsule with small, knoblike tubercle above base of left paramere (fig. 274a) *varius* Knight
Hemelytra brownish yellow or reddish brown, without fuscous spots; genital capsule without tubercle above base of left paramere *fraterculus* group²⁰
- 25(21) Distalmost pale annulus on fore tibiae much narrower than preceding dark annulus—ratio equal to or less than 0.50:1 26
Distalmost pale annulus on fore tibiae about as broad or broader than preceding dark annulus—ratio equal to or greater than 0.66:1 29
- 26(25) Antennal segment II with sharply defined, pale annulus medially *rostratus* group²¹
Antennal segment II sometimes paler medially but without sharply defined annulus 27
- 27(26) Length of antennal segment I less than width of head across eyes; hemelytra tinged or marked with red; length 4.6–5.8 *juniperanus* group²²
Length of antennal segment I equal to or greater than width of head across eyes; hemelytra without red markings; length 5.5–9.2 28
- 28(27) Length of simple setae on hemelytra mostly greater than 1.5 times the thickness of antennal segment I at middle; arm of left paramere of male genitalia with large knoblike or spinelike protuberance dor-

- sally (figs. 15b, 16b, 20b) *aurora* group²³
- Length of simple setae on hemelytra equal to or only slightly greater than medial thickness of antennal segment I; arm of left paramere without dorsal protuberance *fraterculus* group²⁴
- 29(25) Antennal segment II with pale annulus medially 30
- Antennal segment II without pale annulus, or broadly pale medially 36
- 30(29) Pronotal disk with pale, median line bordered by fuscous *rostratus* group²⁵
- Pronotal disk without pale, median line 31
- 31(30) Antennal segment I mostly pale on ventral surface, sometimes marked with small, fuscous patches 32
- Antennal segment I mostly fuscous on ventral surface 34
- 32(31) Ratio of length of antennal segment II to posterior width of pronotum greater than 1.90:1 *juncus* group²⁶
- Ratio of length of antennal segment II to posterior width of pronotum less than 1.80:1 33
- 33(32) Antennal segment II with narrow, fuscous annulus at base followed by pale annulus of similar width; genital capsule of male with broad, laterally flattened tubercle above base of left paramere (fig. 268a) *mesillae* Knight
- Antennal segment II with pale annulus at base; genital capsule with cylindrical, usually tapered tubercle above base of left paramere (figs. 36a, 46a) *conspurcatus* group²⁷
- 34(31) Hemelytra rusty red or reddish brown; areolar veins tinged with red *fraterculus* group²⁸
- Hemelytra grayish white with brown to fuscous markings; areolar veins without red tinge 35
- 35(34) Genital capsule of male with large, broadly truncate tubercle above base of left paramere (fig. 142a); sclerotized process of vesica nearly linear, slightly twisted medially (fig. 142e); length 4.6–4.8 *juniperanus* group²⁹
- Genital capsule without prominent tubercle above base of left paramere, sometimes with small, knoblike or ridgelike protuberance (figs. 230a, 235a); sclerotized process narrowed and strongly curved distad of expanded basal region (figs. 230e, 235e); length 5.0–7.9 *rostratus* group³⁰
- 36(29) Genital capsule of male with long, tapered, posteriorly directed tubercle above base of left paramere (figs. 42a, 140a) .. 37
- Genital capsule without tubercle above base of left paramere, or with broad, dorsally directed tubercle (figs. 12a, 19a) 38
- 37(36) Ventral surface of antennal segment I mostly pale; antennal segment II brownish yellow *conspurcatus* group³¹
- Ventral surface of antennal segment I mostly fuscous; antennal segment II reddish brown or fuscous *juniperanus* group³²
- 38(36) Apices of fore tibiae pale; female with long, erect, bristlelike setae on antennal segment II (fig. 262); male genitalia as in figure 267 *lycii* n. sp.
- Apices of fore tibiae darkened; female without long, bristlelike setae on antennal segment II 39
- 39(38) Arm of left paramere of male genitalia with large, knoblike or spinelike protuberance dorsally (figs. 11b, 12b), or with sensory lobe strongly and acutely produced (fig. 14b)—if arm and sensory lobe unmodified, then genital capsule with broad, dorsally directed tubercle above base of left paramere (fig. 19a) *aurora* group³³
- Arm of left paramere unmodified, sensory lobe rounded, usually with carinate dorsal margin; genital capsule sometimes swollen or with low, ridgelike protuberance above base of left paramere, but never with broad, upright tubercle ... *fraterculus* group³⁴
- 40(1) Hemelytra pale green to bright yellowish green, sometimes with dusky spots or red markings 41
- Hemelytra not green 50
- 41(40) Antennal segment I dark red *vau* Van Duzee
- Antennal segment I pale yellow, brownish yellow, or pale green; sometimes lightly mottled with brown or reddish brown 42
- 42(41) Antennal segment II pale with apical fourth and submedial fourth fuscous *plenus* group³⁵
- Antennal segment II not broadly biannulated with fuscous 43
- 43(42) Length of antennal segment I less than width of head across eyes 44
- Length of antennal segment I equal to or greater than width of head across eyes 45
- 44(43) Pronotal disk grayish white with fuscous

- markings; pronotal collar fuscous; length 6.0–7.0 *becki* Knight
- Pronotal disk pale green or bright yellowish green, sometimes with faint dusky flecks; pronotal collar green; length 4.2–5.7 *juniperanus* group³⁶
- 45(43) Scutellum with small, fuscous dot each side before apex *interspersus* group³⁷
- Scutellum without pair of fuscous dots before apex 46
- 46(45) Hind femora with red markings distally, or extensively reddened and marked with pale spots; pronotal disk broadly marked or tinged with red ... *pulchellus* group³⁸
- Hind femora pale yellow or greenish yellow, sometimes with brown or yellowish brown markings; pronotal disk without red markings 47
- 47(46) Clavus and corium marked with red ... *roseotinctus* Knight
- Clavus and corium without red markings 48
- 48(47) Hemelytra with faint dusky flecks, membrane lightly conspurcate 49
- Hemelytra without dusky flecks, membrane uniformly suffused with fuscous *roseipennis* group³⁹
- 49(48) Hind tibiae with small, spinelike, black setae on dorsal surface; sclerotized processes of vesica without toothlike serrations (figs. 217e, 222e, 231e, 236h, m, v) *rostratus* group⁴⁰
- Hind tibiae without small, black setae; sclerotized process with three toothlike serrations distally (fig. 168f) *plenus* group⁴¹
- 50(40) Ratio of length of antennal segment I to width of head across eyes less than or equal to 0.90:1 for males and less than or equal to 1.00:1 for females 51
- Ratio of length of antennal segment I to width of head across eyes greater than 0.90:1 for males and greater than 1.00:1 for females 59
- 51(50) Venter moderately to densely clothed with closely appressed, silvery white, sericeous or scalelike setae (fig. 193) *pulchricollis* group⁴²
- Venter without dense covering of sericeous or scalelike setae 52
- 52(51) Scutellum strongly convex, abruptly deflexed apically; pronotal disk with deep impression behind calli *plenus* group⁴³
- Scutellum weakly to moderately convex, not abruptly deflexed apically; pronotal disk with weak impression behind calli 53
- 53(52) Sclerotized process of vesica of male genitalia with marginal and/or distal toothlike serrations 54
- Sclerotized process without marginal or distal serrations 57
- 54(53) Sclerotized process with 2–7 coarse serrations distally (figs. 241e, 243e); right paramere lanceolate (figs. 241d, 243d) *stellatus* group⁴⁴
- Sclerotized process with 9–18 marginal serrations along entire length of process, proximal serrations sometimes weakly developed (figs. 106e, 157e, 272e)—sclerotized process rarely with only 6–8 serrations (fig. 107e), but then right paramere elongate (fig. 107d) 55
- 55(54) Clavus and corium with long, erect, bristlelike setae and shorter, suberect, coarse, simple setae; jugum and lorum equally swollen, elongate, strongly produced anteriorly of antennal fossae (fig. 152); females strongly brachypterous *listi* group⁴⁵
- Clavus and corium with simple setae mostly uniform in length, not coarse or bristlelike; lorum more strongly swollen than jugum, shorter, weakly to moderately produced anteriorly of antennal fossae (figs. 98, 99); females macropterous 56
- 56(55) Yellowish brown general coloration; scutellum and propleura uniformly pale or sometimes with limited, faint, red markings; right paramere of male genitalia with spinose process on inner medial surface (fig. 272d); left basal lobe of vesica unmodified *shoshoni* n. sp.
- Brown or dark reddish brown general coloration; scutellum and propleura moderately to extensively darkened with brown or fuscous; right paramere elongate, without process on inner surface (figs. 106d, 112d); left basal lobe of vesica with spinose patch above left margin of gonopore *junceus* group⁴⁶
- 57(53) Genital capsule of male with well developed tubercle above base of left paramere (figs. 33a, 132a) 58
- Genital capsule without tubercle above base of left paramere *fraterculus* group⁴⁷
- 58(57) Apices of fore tibiae pale; rostrum of male reaching near middle of genital capsule; hind femora strongly tapered, basal region greatly expanded, distal half with scattered, long, bristlelike setae; genital capsule of male with broadly produced tubercle above base of left paramere (fig. 33a) *carnosulus* group⁴⁸
- Apices of fore tibiae darkened; rostrum of

- male not reaching beyond seventh or rarely eighth abdominal segment; hind femora gradually tapered, broadest medially, without long, bristlelike setae distally and not strongly expanded basally; left genital tubercle of male narrowly produced (figs. 132a, 137a, 141a) *juniperanus* group⁴⁹
- 59(50) Antennal segment III yellowish brown or yellowish gray, sometimes slightly darker apically 60
- Antennal segment III dark brown or black, sometimes with pale, median annulus 74
- 60(59) Antennal segment I densely set with erect, dark bristlelike setae; thickness of antennal segment I at least twice that of segment II *lasiomerus* group⁵⁰
- Antennal segment I with scattered, usually pale, bristlelike setae; thickness of segment I rarely more than 1.5 times that of segment II 61
- 61(60) Pronotal disk yellow or brownish yellow with fuscous spot behind inner posterior angle of each callus; frons strongly convex, nearly conical in form (fig. 261); length 6.5–10.4 *laevis* (Uhler)
- Pronotal disk without fuscous spots behind inner posterior angles of calli; frons sometimes strongly convex, but never nearly conical in form 62
- 62(61) Scutellum with small, red to fuscous dot each side before apex *interspersus* group⁵¹
- Scutellum without pair of dark dots before apex 63
- 63(62) Sclerotized process of vesica of male genitalia with 3–18 strong, marginal serrations 64
- Sclerotized process without marginal serrations, rarely with pair of tiny serrations apically (fig. 251e), or with single, large spine medially (fig. 247e) 68
- 64(63) Anterior margin of genital aperture of male with prominent tubercle (fig. 273f); ratio of height of eye to width of vertex less than or equal to 1.10:1 for males *varipes* Boheman
- Anterior margin of genital aperture without tubercle; ratio of height of eye to width of vertex greater than 1.25:1 for males 65
- 65(64) Frons mostly shiny fuscous; antennal segment I with short, dark setae only; sclerotized process with 16–18 marginal serrations (fig. 109e) *juncus* group⁵²
- Frons with red to fuscous markings, but never broadly fuscous; antennal segment I with long, pale to golden, bristlelike setae and shorter simple setae; sclerotized process with 3–14 marginal serrations 66
- 66(65) Sclerotized process with 10–14 coarse serrations along entire lateral margin (figs. 187e, 189e, 190e); cuneus marked with red; length 4.2–6.4 ... *pulchellus* group⁵³
- Sclerotized process with 3–6 strong serrations usually restricted to distal half (figs. 170f, 249e), or if process with more than six serrations, then proximal ones very small and originating below midpoint of process (fig. 182e); cuneus without red markings; length 6.0–9.1 ... 67
- 67(66) Shaft of left paramere of male genitalia strongly expanded distally (fig. 249c); genital capsule broadly swollen above base of left paramere, but without prominent tubercle (fig. 249a); sclerotized process of vesica with three spinelike serrations distally (fig. 249e) *tenuis* group⁵⁴
- Shaft of left paramere not, or only weakly expanded distally (figs. 178c, 184c); genital capsule with prominent tubercle above base of left paramere (figs. 179a, 182a), or if tubercle absent, then sclerotized process with six strong, marginal serrations (fig. 184a) ... *plenus* group⁵⁵
- 68(63) Vesica with three or four sclerotized processes (figs. 49e–h, 51e–g), or if only one process present (fig. 53e), then hemelytra mottled with red or reddish orange *cunealis* group⁵⁶
- Vesica with one or two sclerotized processes; hemelytra sometimes marked or tinged with red, but never with extensive mottled pattern of red or reddish orange 69
- 69(68) Ratio of height of eye to width of vertex less than or equal to 1.00:1; females brachypterous or submacropterous ... 70
- Ratio of height of eye to width of vertex greater than 1.00:1; females macropterous 71
- 70(69) Length of male 4.8–5.6; sclerotized process of vesica short, sometimes coiled basally, length of process equal to or less than length of right paramere (figs. 26e, 28e); female submacropterous or brachypterous *candidus* group⁵⁷
- Length of male 6.5–9.2; vesica with one or two sclerotized processes—right process elongate, weakly to moderately curved, length of process greater than length of right paramere (figs. 204e, 205f); female strongly brachypterous *roseipennis* group⁵⁸

- 71(69) Posterior submargin of pronotal disk with fuscous line or series of dark patches, or if dark markings indistinct then length of antennal segment I greater than posterior width of pronotum *tenuis* group⁵⁹
 Posterior submargin of pronotal disk without fuscous markings, but sometimes with patches of dark setae; length of antennal segment I less than posterior width of pronotum 72
- 72(71) Genital capsule of male with prominent tubercle above base of left paramere (figs. 31a, 232a); right paramere elongate or narrowly lanceolate (figs. 31d, 232d) 73
 Genital capsule sometimes broadly swollen above base of left paramere, but without prominent tubercle; right paramere broad with stout tubercles on inner distal surface (figs. 59c, 61c) *fraterculus* group⁶⁰
- 73(72) Left genital tubercle of male narrowly produced (fig. 232a); fore tibiae without dark annuli or darkened at apex only *rostratus* group⁶¹
 Left genital tubercle broadly produced (fig. 31a); fore tibiae with three or four dark annuli, apex pale .. *carnosulus* group⁶²
- 74(59) Dorsal half to two-thirds of propleura fuscous, rarely with short pale stripe crossing anterior margin, apical region pale 75
 Dorsal half of propleura always broadly marked with pale, never uniformly fuscous 81
- 75(74) Antennal segment II with pale, median annulus *tiliae* group⁶³
 Antennal segment II without pale, median annulus 76
- 76(75) Genital capsule of male with prominent tubercle above base of left paramere (fig. 32a, 103a) 77
 Genital capsule without tubercle above base of left paramere 78
- 77(76) Apices of fore tibiae pale; females strongly brachypterous *carnosulus* group⁶⁴
 Apices of fore tibiae darkened; females macropterous *junceus* group⁶⁵
- 78(76) Dorsal width of eye of male less than width of vertex; female strongly brachypterous *omani* n. sp.
 Dorsal width of eye of male equal to or greater than width of vertex; females macropterous 79
- 79(78) Fore tibiae with one or two faint, dark annuli; rostrum reaching apices of hind coxae or slightly beyond *stellatus* group⁶⁶
 Fore tibiae with three well defined fuscous annuli; rostrum reaching well beyond apices of hind coxae 80
- 80(79) Wing membrane mottled with fuscous, margins of dark areas sometimes breaking into small spots; right paramere of male genitalia with strong dorsal process (fig. 269d); left basal lobe of vesica unmodified *neglectus* Knight
 Wing membrane conspurcate; right paramere without dorsal process (figs. 105d, 107d, 111d); left basal lobe of vesica with spinose patch above left margin of gonopore *junceus* group⁶⁷
- 81(74) Fore tibiae with one or two dark annuli, or without dark bands 82
 Fore tibiae with 3–5 dark annuli 83
- 82(81) Frons mostly shiny fuscous; genital capsule of male with large, broad tubercle above base of left paramere (fig. 109a) sclerotized process of vesica with 16–18 marginal serrations (fig. 109e); length 7.3–8.5 *junceus* group⁶⁸
 Frons mostly pale, sometimes with dark striae laterally, but never broadly fuscous; genital capsule without tubercle above base of left paramere (fig. 252a); sclerotized process without marginal serrations (fig. 252e); length 5.0–6.5 .. *tenuis* group⁶⁹
- 83(81) Fore tibiae with four pale annuli, sometimes interrupted by dark spots especially on dorsal surface .. *plenus* group⁷⁰
 Fore tibiae with three pale annuli 84
- 84(83) Antennal segment I red or reddish brown with broad, pale annulus medially .. *plenus* group⁷¹
 Antennal segment I never red with broad annulus medially 85
- 85(84) Antennal segment II with pale, median annulus 86
 Antennal segment II without pale, median annulus 88
- 86(85) Hemelytra tinged or marked with red; dorsal margin of propleura pale *plenus* group⁷²
 Hemelytra with brown to fuscous markings; dorsal margin of propleura fuscous 87
- 87(86) Antennal segment III with pale, median annulus; sclerotized process of vesica with three large, widely spaced serrations (fig. 248e) *tenuis* group⁷³
 Antennal segment III without pale, median annulus; sclerotized process with

- 20 or more small, close-set serrations (figs. 256d, 257d) *tiliae* group⁷⁴
- 88(85) Antennal segment II sparsely set with long, erect, bristlelike setae, length of setae more than three times thickness of segment *plenus* group⁷⁵
- Antennal segment II without long, erect setae 89
- 89(88) Antennal segment I much thicker basally than distally; vesica of male aedeagus without a sclerotized process *plenus* group⁷⁶
- Antennal segment I not, or only slightly thicker basally; vesica with well developed sclerotized process 90
- 90(89) Cuneus tinged or marked with red; sclerotized process of vesica bulbous basally, tapered distally (fig. 68d) *fraterculus* group⁷⁷
- Cuneus without red markings; sclerotized process of vesica not bulbous basally .. 91
- 91(90) Sclerotized process of vesica with 10–14 marginal serrations (fig. 104e) *junceus* group⁷⁸
- Sclerotized process of vesica without or with only 1–3 serrations distally (figs. 247e, 249e, 250e, 252e) *tenuis* group⁷⁹
15. *acaciae*, *adenostomae*, *adustus*, *albellus*, *albifrons*, *brevicornis*, *breviusculus*, *hualapai*, *juniperanus*, *latisquamus*, *monophyllae*, *nigrisquamus*, *occidentalis*, *sangabriel*, *tricinctus*
16. *occidentalis*
17. *auranti*, *cochise*, *jucundus*, *mirus*
18. *pinto*
19. *ramosus*
20. *mellarius*, *politus*
21. *borregoi*, *sacramento*
22. *occidentalis*
23. *cercocarpi*, *dumicola*, *tobrendae*
24. *commissuralis*, *corticola*, *fraterculus*, *heidemannii*, *inops*, *praealtus*
25. *strigosus*
26. *coniferalis*
27. *bituberis*, *californicus*, *calli*, *calvus*, *conspurcatus*, *empirensis*, *juliae*, *ketinelbi* *relativus*, *utahensis*
28. *umbrosus*
29. *sangabriel*
30. *borregoi*, *catalinae*, *difformis*, *sacramento*, *yuma*
31. *juliae*
32. *occidentalis*
33. *angustatus*, *aurora*, *ceanothicus*, *cercocarpi*, *dumicola*, *lattini*, *sagax*, *sanbernardino*, *tobrendae*
34. *chihuahuanae*, *kuschei*, *mellarius*, *piceicola*, *schuhi*, *simulatus*
35. *electilis*
36. *cuneotinctus*, *vanduzeei*
37. *hypoleucoides*, *interspersus*
38. *pulchellus*, *rubrocuneatus*, *rubroornatus*
39. *fuscipennis*
40. *consors*, *geniculatus*, *schwartzi*
41. *hirsuticus*
42. *imperialensis*, *torridus*
43. *tenerum*
44. *alpestris*, *atriscutum*, *huachuca*, *stellatus*
45. *albicuneatus*, *decorus*, *hispidus*, *listi*, *schaffneri*
46. *dreisbachi*, *intermontanus*, *quercinus*, *radiatae*
47. *comulus*, *mellarius*
48. *presidio*
49. *breviusculus*, *miniatus*, *polhemusi*
50. *lasiomerus*, *pallidicornis*, *rubropictus*
51. *eureka*, *hypoleucoides*, *interspersus*, *kiowa*, *navajo*
52. *nigrifrons*
53. *olseni*, *quercicola*, *rubrocuneatus*
54. *insulatus*
55. *ingens*, *sanjoaquin*, *seminotatus*, *stitti*, *tenerum*
56. all species
57. *candidus*, *suavis*

Species List for Group Key

The following list is an accounting of the species associated with each couplet of the key to species-groups. The species are listed numerically—the numbers corresponding to the superscript numerals following the word “group” in the key.

1. *rubroornatus*
2. *vanduzeei*
3. *berbericola*
4. *nicholi*
5. *pulchricollis*
6. *albidosquamus*, *squamosus*
7. *tricinctus*, *ventralis*
8. *albidopictus*
9. *cienea*
10. *lineatus*, *strigosus*
11. *brevisetosus* (male only), *cinereus*, *hopi*, *nigrolineatus*
12. *alamogordo*, *apache*, *brevisetosus* (female only), *sonorensis*
13. *aesculinus*, *arizonensis*, *baboquivari*, *beameri*, *coronadoi*, *deserticola*, *ejuncidus*, *maricopae*, *minituberculatus*, *purshiae*, *rostratus*, *sacramento*, *sublineatus*, *yavapai*
14. *strigosus*

58. all species
59. *canescens*, *maritimus*
60. *auranti*, *cochise*, *jucundus*, *mellarius*, *mirus*
61. *strigosus* (pale form)
62. *carnosulus*
63. *populi*, *tiliae*
64. *carnosulus*, *chemehuevi*
65. *alpinus*, *argus*, *cowaniae*, *dreisbachi*, *knowltoni*, *nobilis*, *rainieri*, *tricinctipes*, *usingeri*, *yollabollae*
66. *angusticollis*
67. *decurvatus*, *intermontanus*, *quercinus*
68. *nigrifrons*
69. *tenuis*
70. *aridus*, *breviatus*, *desertinus*, *formosus*, *hirtus*, *ingens*, *megatuberis*, *microfascinum*, *plenus*, *quadriannulipes*, *reticulatus*, *roseus*, *sierrae*, *solano*, *tehachapi*
71. *conspicuus*
72. *roseus*
73. *histriculus*
74. *dimidiatus*, *populi*
75. *longihirtus*
76. *bakeri*
77. *jucundus*
78. *cowaniae*
79. *canescens*, *insulatus*, *leucophaeus*, *tenuis*

AURORA SPECIES-GROUP

DIAGNOSIS: Recognized by the brown or reddish brown general coloration; short head with large eyes (fig. 9); dorsum with two types of broad, asymmetrical, scalelike setae (fig. 10); posterior submargin of pronotal disk with 4–6 weakly elevated, tumid points; and the following characters of the male genitalia: genital capsule with broad, upright tubercles above paramere bases; arm of left paramere usually with large, knoblike or spinelike process dorsally; right paramere with spinose process or series of prominent spines on inner-dorsal surface; vesica with deeply divided primary membranous sac—lobes usually weakly sclerotized in part and with patches of small tubercles, left lobe with broadly attached, elongate sclerite on inner surface; and sclerotized process of vesica flattened, elongate or lanceolate, sometimes twisted or with reflexed margins, or rarely somewhat bulbous basally with flattened, tapered distal region.

DESCRIPTION: Moderate size, 5.8–7.7, brown, grayish brown, or reddish brown species; vestiture of dorsum with dark, simple setae, silvery white, scalelike setae with irregular, wrinkled fine structure, and dark brown or black, scalelike setae with regular, oblique ridges—both types of scalelike setae strongly asymmetrical. **Head:** short—height in lateral view usually much greater than length; frons weakly to moderately convex, usually only narrowly produced beyond antennal fossae and with 6–8 dark striae laterally; tylus moderately prominent, meeting frons along broad depression; antennae yellowish brown to fuscous, segments III and IV usually darker than segment II; segment I

longer than width of head across eyes, dorsal surface with irregular pale markings, ventral surface usually pale; segment II without pale, median annulus; eyes occupying two-thirds to nearly entire height of head in lateral view; gena and gula narrowly developed. **Pronotum:** posterior submargin of disk with transverse fuscous band and 4–6 weakly elevated, tumid points; propleura fuscous, apical third pale. **Hemelytra:** moderately to extensively darkened with brown to fuscous; corium usually with large pale patch apically; cuneus sometimes marked or tinged with red; membrane moderately to densely spotted or mottled with fuscous. **Legs:** femora white or pale yellow with brown to fuscous markings, dark regions usually interrupted by pale spots; hind femora extensively darkened, especially on apical half; front and middle tibiae with three or four dark annuli. **Male genitalia:** genital capsule, except *berbericola* and *ceanothicus*, with broad, upright tubercles dorsad of paramere bases. **Left paramere:** arm except *berbericola* and *sanbernardino* with large knoblike or spinelike process dorsally, or with prominent, angulate sensory lobe; inner-ventral surface of arm excavated; inner-distal surface of sensory lobe with field of tubercles or small spines; shaft slightly expanded distally in dorsal view, apex acute or narrowly rounded. **Right paramere:** size and shape variable, usually broad basally, with spinose process or several large spines on inner-dorsal surface; distal portion sometimes long and narrow, rarely extending to base of left paramere; apex acute, rarely strongly recurved. **Vesica:** large primary membranous sac, deep-

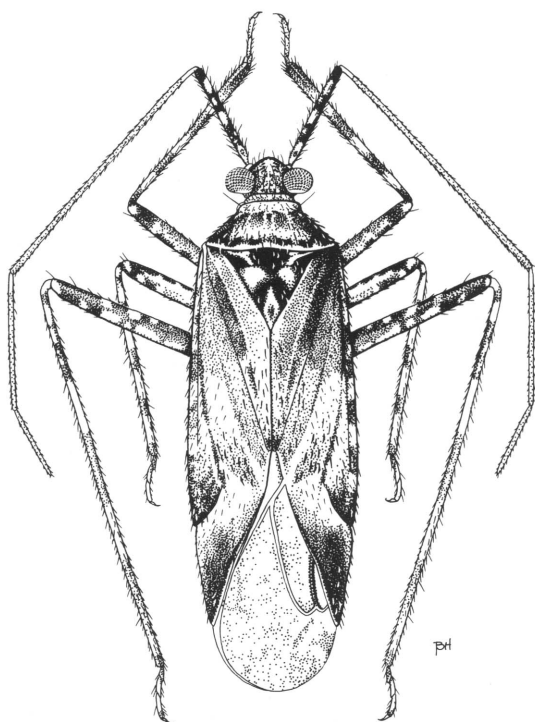


Fig. 8. *Phytocoris dumicola*, dorsal habitus of male.

ly divided medially—lobes usually weakly sclerotized in part and with patches of small tubercles, left lobe with broadly attached, elongate sclerite on inner surface; basal lobes well developed; sclerotized process flattened, elongate or lanceolate, sometimes extending to or slightly beyond apex of membranous sac, sometimes with reflexed basal margins, or rarely bulbous basally with flattened, tapered distal region; basal process well sclerotized, expanded distally, continuous with sclerotized basal region of right lobe of membranous sac.

DISCUSSION: Members of the *aurora* group are widely distributed in forested regions of the western United States. The majority of species inhabit shrubs (e.g., *Berberis*, *Ceanothus*, *Purshia*) or small, nonconiferous trees (e.g., *Castanopsis*, *Cercocarpus*, *Quercus*, *Salix*), mostly in open forest situations. One exception is *sagax*, which occurs on *Abies* and *Larix* in the Cascade Range and Sierra Nevada Mts.

Based on the structure of the male vesica,

aurora group species appear to be most closely related to species belonging to the *conspurcatus* and *juniperanus* groups. The partially sclerotized lobes of the vesica, and elongate, flattened, nonserrate sclerotized process are unique to these species-groups. Together with the *fraterculus* group, the *aurora*, *conspurcatus*, and *juniperanus* groups form a monophyletic assemblage defined by the broad, asymmetrical, scalelike setae on the dorsum (see also *tenuis* group discussion).

KEY TO SPECIES OF THE *AURORA* GROUP

- 1 Ratio of length of antennal segment I to posterior width of pronotum from 0.70:1 to 0.95:1 2
- Ratio of length of antennal segment I to posterior width of pronotum from 0.95:1 to 1.20:1 8
- 2(1) Apical pale annulus on front tibiae much narrower than preceding dark annulus ... 3
- Apical pale annulus on front tibiae about as broad or broader than preceding dark annulus 5
- 3(2) Shaft of right paramere elongate (fig. 15d), reaching to or slightly beyond base of left paramere, apex strongly recurved *cercocarp* Knight
- Shaft of right paramere shorter, not reaching beyond middle of genital aperture, apex not strongly recurved 4
- 4(3) Right paramere broad, inner surface with large bifurcate (rarely trifurcate) process (fig. 16d); dorsal process on arm of left paramere well removed from apex of sensory lobe (fig. 16b) *dumicola* n. sp.
- Right paramere narrow, inner surface with three or four stout spines (fig. 20d); dorsal process on arm of left paramere narrowly removed from apex of sensory lobe (fig. 20b) *tobrendae* n. sp.
- 5(2) Arm of left paramere with large knoblike dorsal process between sensory lobe and base of shaft (figs. 11b, 18b, c); right paramere with one to several strong spines on inner-dorsal surface (figs. 11d, 18d) 6
- Arm of left paramere without knoblike dorsal process (figs. 13b, 19b); right paramere without strong spine(s) on inner-dorsal surface (figs. 13d, 19d) 7
- 6(5) Middle tibiae with three or four narrow fusiform annuli; dorsal process on arm of left paramere large, produced dorsally above level of sensory lobe (fig. 11b); shaft of right

- paramere short (fig. 11d), not reaching to base of left paramere . . . *angustatus* Knight
- Middle tibiae without dark annuli, or with a single narrow band apically; dorsal process on arm of left paramere small, well removed from and not produced above level of sensory lobe (fig. 18b, c), shaft of right paramere elongate (fig. 18d), reaching to base of left paramere . . . *sagax* Van D.
- 7(5) Genital capsule of male with large, broadly rounded tubercle above base of left paramere (fig. 19a); shaft of left paramere narrowly expanded distally (fig. 19c); right paramere and sclerotized process of vesica as in figures 19d and 19e, respectively . . . *sanbernardino* n. sp.
- Genital capsule of male broadly swollen above base of left paramere, but lacking distinct tubercle (fig. 13a); shaft of left paramere more broadly expanded distally (fig. 13c); right paramere and sclerotized process as in figures 13d and 13e, respectively . . . *berbericola* n. sp.
- 8(1) Ratio of length of antennal segment I to posterior width of pronotum from 0.95:1 to 1.10:1; sclerotized process not reaching beyond apex of right primary lobe of vesica . . . 9
- Ratio of length of antennal segment I to posterior width of pronotum from 1.10:1 to 1.20:1; sclerotized process reaching beyond apex of right primary lobe of vesica . . . *lattini* n. sp.
- 9(8) Sensory lobe of left paramere rounded, arm with large dorsal process between lobe and base of shaft (fig. 12b, c); right paramere with three or four preapical spines on inner-dorsal surface (fig. 12d); sclerotized process of vesica as in figure 12e . . . *aurora* Van D.
- Sensory lobe of left paramere acutely produced, arm without dorsal process between lobe and base of shaft (fig. 14b); right paramere without preapical spines; sclerotized process of vesica as in figure 14e . . . *ceanothicus* n. sp.

Phytocoris angustatus Knight

Figure 11

Phytocoris angustatus Knight, 1961: 483, 484, fig. 2; 1968: 223.

TYPES: This species was described from six specimens collected at Prescott, Yavapai Co., Arizona, 4 August 1917, H. H. Knight. A female with the following label data, and bearing a Knight paratype label also was examined: Williams, Coconino Co., Arizona, 4

August 1917, H. H. Knight. The data for the latter specimen was not included in original description. The male holotype and five paratypes are retained in the Knight Collection (USNM); one male paratype was not located.

DIAGNOSIS: Length 6.1–6.8. *Phytocoris angustatus* is distinguished from other species of the *aurora* group by the following combination of characters: ratio of length of antennal segment I to posterior width of pronotum from 0.85:1 to 0.95:1 for males; apical pale annulus on front tibiae only slightly narrower than preceding dark annulus; middle tibiae marked with three or four narrow, fuscous annuli; and dorsal process on arm of left paramere broad, and produced dorsally above level of sensory lobe (fig. 11b). Right paramere and sclerotized process as in figure 11d, e.

DISCUSSION: *Phytocoris angustatus* is known only from the type material collected in Coconino Co. and Yavapai Co., Arizona. The host plant is not known, but this species probably inhabits a shrubby plant, possibly in the family Rosaceae (e.g., *Cercocarpus*, *Purshia*).

Phytocoris aurora Van Duzee

Figures 9, 12

Phytocoris aurora Van Duzee, 1920: 340, 341. – Carvalho, 1959: 191.

TYPES: This species was described from a single male collected at Cayton, Shasta Co., California, 19 July 1918, E. P. Van Duzee. The holotype (no. 689) is retained in the Van Duzee Collection (CAS).

DIAGNOSIS: Length 5.9–7.9. Most similar to *ceanothicus* but distinguished by the structure of the male genitalia: sensory lobe of the left paramere rounded, dorsal process originating between apex of lobe and angle (fig. 12b); right paramere with three or four preapical spines on dorsal surface (fig. 12d); and sclerotized process of vesica short with acute apex (fig. 12e). Specimens of *aurora* also tend to be slightly larger and with fewer fuscous markings than *ceanothicus*.

DISCUSSION: This species is distributed in the Coast and Cascade ranges of Oregon and northern California. Specimens have been collected as far north as Marys Pk., Benton Co., Oregon. The southernmost record is from Johnsville, Plumas Co., California. Adults

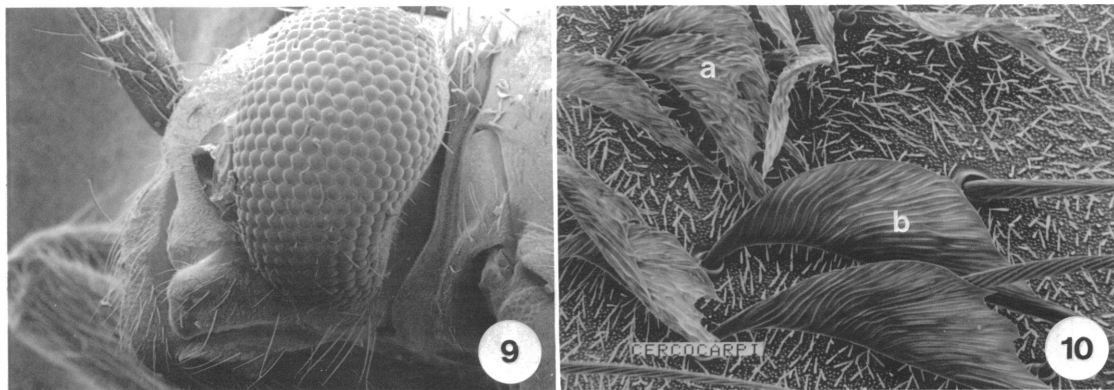


Fig. 9, 10. *Aurora* group species. 9. *aurora*, lateral view of head. 10. *cercocarpi*, dorsal vestiture: a, white scalelike setae; b, black scalelike setae.

have been taken on *Castanopsis chrysophylla* (Dougl.) A. DC. and *Quercus garryana* Dougl. Forty-two specimens were examined with collection dates from August 9 to October 10.

***Phytocoris berbericola*, new species**

Figure 13

HOLOTYPE MALE: Jones Water Campground, 17 mi N of Globe, 4300 ft (1310 m), Gila Co., Arizona, 30 May 1983, ex. *Berberis fremontii* Torr., R. T. Schuh and G. M. Stonedahl (AMNH).

PARATYPES: ARIZONA. **Gila Co.:** 6 males, 9 females, same data as holotype (AMNH). **Navajo Co.:** 7 females, 15–20 mi SW of Show Low, 1585–1830 m, 30 May 1983, ex. *Berberis fremontii*, R. T. Schuh, G. M. Stonedahl, and B. M. Massie (AMNH). **Yavapai Co.:** 5 males, 3 females, 22.7 mi S of Ash Fork on Rt. 89, 4 June 1983, ex. *Berberis fremontii*, G. M. Stonedahl (AMNH); 1 female, 1 mi N of Int. 17 on Rt. 179, T15N R6E Sec 18, 1160 m, 15 June 1983, ex. *Berberis fremontii*, R. T. Schuh and M. D. Schwartz (AMNH). **NEW MEXICO. Otero Co.:** 1 male, 1 female, Cloudcroft, 27 June 1940, R. H. Beamer (KU). **TEXAS. Brewster Co.:** 1 male, 9 mi W of Alpine, 30°16'N, 103°47'W, 17 August 1965, taken at light, J. C. Schaffner (TA&M). **Jeff Davis Co.:** 2 males, 1 female, Davis Mts., 3 mi W of Ft. Davis, 30 April 1982, ex. *Berberis trifoliolata* Moric., D. A. and J. T. Polhemus (JTP).

DIAGNOSIS: Recognized by the short first antennal segment, ratio of segment length to

posterior width of pronotum from 0.68:1 to 0.79:1; distal two-thirds of hind femora dark reddish brown to deep purplish black with scattered pale spots; and structure of male genitalia similar to that of *sanbernardino* but without prominent tubercles on genital capsule above paramere bases (fig. 13a), shaft of left paramere more broadly expanded distally (fig. 13c), sclerotized process of vesica strongly narrowed distally (fig. 13e), and membranous sac of vesica without sclerotized tubular process originating from inner margin of left primary lobe. The pale annuli on the fore tibiae are somewhat variable in width, but usually are about as broad as the dark annuli.

DESCRIPTION: *Male.* Length 4.90–5.65, width 1.58–1.82; reddish brown general coloration. **Head:** width across eyes 0.85–0.94, vertex 0.34–0.38; frons and vertex grayish yellow with red markings, other regions mostly dark ruby red with scattered pale maculae. **Rostrum:** length 2.30–2.48, reaching between third and fifth abdominal segments. **Antennae:** I, length 0.95–1.00, pale grayish yellow with brown or reddish brown markings dorsally and laterally; II, length 2.09–2.21, brownish yellow; III, length 1.04–1.14, brown or dark brown; IV, length 0.69–0.79, brown or dark brown. **Pronotum:** mesal length 0.77–0.88, posterior width 1.29–1.48; disk brown or brownish gray, usually somewhat darker brown laterally, sometimes tinged with red; posterior submargin of disk with transverse fuscous band and 4–6 weakly elevated points, extreme posterior margin narrowly pale; collar and calli moderately to extensively darkened with brown, reddish brown,

or fuscous; propleura fuscous, apical third pale. **Scutellum:** grayish yellow ground color, moderately to extensively darkened with red, reddish brown or dark brown, distal third usually marked with large fuscous spot on either side. **Hemelytra:** grayish white ground color with brown or fuscous markings mostly along veins, distal fourth of corium, and on cuneus; sometimes also tinged with red, especially on cuneus and along outer margin of corium, rarely more extensively reddened; basal region of cuneus and bordering margin of corium usually noticeably paler, middle of corium also sometimes with lighter coloration; membrane moderately to densely mottled with fuscous, veins brown or yellowish brown, sometimes red or reddish brown. **Legs:** femora pale grayish yellow with red or reddish brown reticulate mottling; distal two-thirds of hind femora dark reddish brown with pale spots; tibiae pale with brown or reddish brown markings; fore tibiae with four dark annuli including narrow band at base, dark annuli as broad as or broader than intervening pale regions. **Vestiture:** as noted in group description. **Genitalia:** Figure 13.

Female. Similar to male in color, vestiture, and structure. Length 5.10–5.62, width 1.70–1.96. **Head:** width across eyes 0.89–0.94, vertex 0.39–0.41. **Rostrum:** length 2.44–2.58, reaching between fourth and sixth abdominal segment. **Antennae:** I, 1.00–1.18; II, 2.26–2.52; III, 1.11–1.28; IV, 0.73–0.84. **Pronotum:** mesal length 0.78–0.89, posterior width 1.34–1.53.

ETYMOLOGY: From the Latin, *berberis* (barberry) and *-cola* (dweller), referring to the association of this species with the plant genus *Berberis* L.

DISCUSSION: As is the case with *sanbernardino*, the genital parameres of *berbericola* are not typical of the *aurora* group, suggesting instead a closer relationship with species of the *conspurcatus* group. In addition, *berbericola* lacks a genital tubercle, a feature shared by all *aurora* and *conspurcatus* group species. However, based on external morphology (e.g., head structure, vestiture) and the structure of the vesica, *berbericola* appears to be most closely related to *aurora* species, and thus is here treated as a member of that group.

Phytocoris berbericola has been collected in Arizona, New Mexico, and western Texas

on *Berberis fremontii* Torr. and *B. trifoliolata* Moric.

***Phytocoris ceanothicus*, new species**

Figure 14

HOLOTYPE MALE: Mill Crk., San Bernardino Mts., 1830 m, San Bernardino Co., California, 23 July 1939, ex. *Ceanothus cordulatus* Kell., Timberlake (UCR; donated to the AMNH).

PARATYPES: CALIFORNIA. **Calaveras Co.:** 1 male, Mokelumne Hill, 5 July 1950, A. T. McClay (UCD). **Mariposa Co.:** Yosemite, 1183–1219 m: 3 females, 17 June 1928, E. O. Essig (UCB); 2 males, 3 females, 7 June 1931 (LACM, OSU, UCB, UCD); 1 female, 8 June 1931 (LACM). **Riverside Co.:** 1 male, 1 female, Pine Flat, San Jacinto Mts., 1768 m, 15 June 1940, ex. *Ceanothus* sp., F. H. Rindge (UCB). **San Bernardino Co.:** 1 male, same data as holotype (UCR). **Shasta Co.:** 1 male, Big Bend 855 m, 3 July 1965, R. M. Brown (CAS); 2 males, 1 female 15 mi SE Big Bend, 4–5 July 1969, taken at light, R. M. Brown (CAS, OSU); 1 male, 3 mi NE Burney, 15 July 1965, R. L. Langston (UCB).

DIAGNOSIS: *Phytocoris ceanothicus* is distinguished from other species of the *aurora* group by the following combination of characters: ratio of length of antennal segment I to posterior width of pronotum from 0.95:1 to 1.05:1 for males; genital capsule of male without tubercles above paramere bases (fig. 14a); sensory lobe of left paramere acutely produced (fig. 14b); right paramere without preapical spines; and sclerotized process of vesica long and narrow (fig. 14e).

DESCRIPTION: *Male.* Length 6.53–6.69, width 1.94–2.07; brownish gray general coloration. **Head:** width across eyes 1.01–1.12, vertex 0.28–0.34; pale yellow with reddish brown markings; frons weakly convex, with 6–8 dark striae laterally. **Rostrum:** length 2.50–2.61, reaching fifth or sixth abdominal segment. **Antennae:** I, length 1.39–1.57, dark reddish brown or fuscous with pale maculae on dorsal aspect, ventral surface sometimes pale apically; II, length 2.97–3.53, brown or brownish yellow; III, length 1.44–1.76, brown or dark brown; IV, length 0.95–1.13, brown or dark brown. **Pronotum:** mesal length 0.76–0.88, posterior width 1.46–1.57; disk brown-

ish yellow, extensively marked with fuscous, lateral margins and posterior submargin often broadly darkened, extreme posterior margin pale; collar reddish brown or fuscous with pale spot medially; calli extensively marked with reddish brown or fuscous; propleura fuscous, apical third pale. **Scutellum:** pale with fuscous area either side of middle running to lateral margin; apex usually with two reddish marks, sometimes joined medially. **Hemelytra:** grayish white, lightly to moderately marked with brown or dark brown particularly along veins, margins of corium, and on cuneus; corium usually with large fuscous patch on outer posterior angle and another between anal ridge and radial vein; outer margin of corium and margins of cuneus often lightly tinged with red; membrane densely mottled with fuscous. **Legs:** femora white or pale yellow with reddish brown or fuscous markings, apical fourth and leading edge extensively darkened and marked with pale spots; tibiae pale with reddish brown or fuscous markings; front and middle tibiae with three or four dark annuli, hind tibiae sometimes with two or three dark annuli. **Vestiture:** dorsum with black, simple setae, black, scalelike setae, and silvery white, scalelike setae. **Genitalia:** Figure 14.

Female. Similar to male in color, vestiture, and structure. Length 5.67–6.48, width 1.75–2.07. **Head:** width across eyes 0.91–1.02, vertex 0.40–0.43. **Rostrum:** 2.57–2.75, reaching fourth or fifth abdominal segment. **Antennae:** I, 1.48–1.64; II, 3.04–3.36; III, 1.71–1.80; IV, 0.99–1.19. **Pronotum:** mesal length 0.76–0.92; posterior width 1.39–1.62.

ETYMOLOGY: Named for its occurrence on *Ceanothus*.

DISCUSSION: *Phytocoris ceanothicus* has been collected in the San Jacinto Mts., San Bernardino Mts., San Gabriel Mts., and the Sierra Nevada Mts. of California as far north as Burney in Shasta County. Adults have been taken on *Ceanothus cordulatus* Kell. and *Ceanothus* sp.

ADDITIONAL SPECIMENS: 15 specimens were examined from the following localities: CALIFORNIA. **Fresno Co.:** Huntington Lk. (CAS); Kings R. Cyn. (CAS). **Los Angeles Co.:** Mt. Wilson (CAF&A, CAS). **Nevada Co.:** Soda Springs Smt., 1830 m (CAS). **San Bernardino Co.:** Forest Home (CAS); Mill Crk.

Cyn. (CAS). **San Diego Co.:** Unknown locality (CAS). The range of occurrence is from July 4 to October 18. The specimen from Soda Spgs. Smt., Nevada County was incorrectly designated a female paratype of *Phytocoris fraterculus* by E. P. Van Duzee, and the specimen from San Diego County was similarly misplaced as a female paratype of *Phytocoris sonorensis* Van Duzee. These specimens now bear my identification label for *ceanothicus* and are retained in the collection of the CAS.

Phytocoris cercocarpi Knight

Figures 10, 15

Phytocoris cercocarpi Knight, 1928: 39–41. – Carvalho, 1959: 194. – Knight, 1968: 229, fig. 284.

TYPES: Described from 20 specimens collected in El Paso Co. and Las Animas Co., Colorado. The male holotype, allotype, and 17 paratypes were taken at Stonewall, Las Animas Co., 2590 m, 7 August 1925, ex. *Cercocarpus betuloides* Nutt., H. H. Knight. All type material is retained in the Knight Collection (USNM); five paratypes were not located.

DIAGNOSIS: Length 5.5–7.0. *Phytocoris cercocarpi* is distinguished from other species of the *aurora* group by the following characters: ratio of length of antennal segment I to posterior width of pronotum from 0.70:1 to 0.80:1 for males; apical pale annulus on front tibiae much narrower than preceding dark annulus; shaft of right paramere reaching to or slightly beyond base of left paramere, apex strongly recurved (fig. 15d); and left paramere as in figure 15b, c.

DISCUSSION: This species has been collected in mountainous regions of southeastern Arizona, northeastern Utah, and western Colorado and New Mexico. Adults have been taken on *Cercocarpus betuloides* Nutt., *C. breviflorus* A. Gray, *C. ledifolius* Nutt., and *C. montanus* Raf. I have examined several dozen specimens with collection dates from June 1 to September 14.

Phytocoris dumicola, new species

Figures 8, 16

HOLOTYPE MALE: 2–5 mi S of Viola, 1360 m, Shasta Co., California, 9 July 1980, ex. *Ceanothus integerrimus* H.&A., G. M. Stonedahl and R. T. Schuh (AMNH).

PARATYPES: CALIFORNIA. **Mariposa Co.:** 6 males, 1 female, Miami Ranger Stn., 1524 m, 29 June and 1 July 1946, H. P. Chandler (CAS, UCB). **Shasta Co.:** 10 females, same data as holotype, 1360–1390 m, 9–10 July 1980 (AMNH, CAS, OSU). OREGON. **Klamath Co.:** 24 males, 5 females, 1 mi W Crescent, 1372 m, 17 July 1979, ex. *Purshia tridentata* (Pursh) DC., G. M. Stonedahl and M. D. Schwartz (OSU, USNM).

DIAGNOSIS: *Phytocoris dumicola* is distinguished from other species of the *aurora* group by the following combination of characters: ratio of length of antennal segment I to posterior width of pronotum from 0.75:1 to 0.95:1 for males; pale annuli on front tibiae much narrower than dark annuli; right paramere broad with large bifurcate (rarely trifurcate) process on inner surface of arm (fig. 16d); dorsal process on arm of left paramere well removed from apex of sensory lobe (fig. 16b).

DESCRIPTION: *Male.* Length 6.32–7.72, width 1.89–2.25; brown or brownish gray general coloration, sometimes lightly tinged with red. **Head:** width across eyes 1.02–1.10, vertex 0.32–0.36; white or pale yellow with reddish brown or fuscous markings; frons moderately convex, meeting tylus along shallow depression, mostly fuscous with pale mark medially. **Rostrum:** length 2.56–3.07, reaching between fifth and seventh abdominal segments. **Antennae:** I, length 1.19–1.55, dark reddish brown or fuscous with pale patches dorsally, ventral surface sometimes pale distally; II, length 2.84–3.31, brown or dark yellowish brown, sometimes tinged with red; III, length 1.31–1.67, brown or dark brown; IV, length 0.94–1.13, brown or dark brown. **Pronotum:** mesal length 0.83–0.92, posterior width 1.49–1.69; disk pale yellow to brownish yellow, moderately to extensively tinged or marked with brown to fuscous, lateral margins usually broadly infuscated, posterior margin narrowly pale; posterior submargin of disk with transverse fuscous band and 4–6 weakly elevated points; collar tinged with brown or reddish brown, with pale spot medially; calli tinged with brown and usually with reddish brown or fuscous reticulations; propleura dark reddish brown or fuscous, apical third pale. **Scutellum:** pale yellow, extensively darkened with brown to fuscous, apex usually broadly pale with two reddish

brown or fuscous parallel lines medially. **Hemelytra:** grayish white or grayish yellow, extensively tinged with brown and mottled with brown to fuscous patches; outer margin of corium and cuneus sometimes tinged with red; membrane densely mottled with fuscous. **Legs:** femora white or pale yellow, moderately to extensively darkened with reddish brown or fuscous particularly on apical half, dark regions broken by pale spots; hind femora with three or four large pale spots on anterior margin; tibiae pale with reddish brown or fuscous markings; fore tibiae with four dark annuli including narrow band at base, distal three bands much broader than pale annuli. **Vestiture:** dorsum with long, dark, simple setae, black, scalelike setae, and silvery white, scalelike setae. **Genitalia:** Figure 16.

Female. Similar to male in color, vestiture, and structure. Length 6.16–7.07, width 1.89–2.03. **Head:** width across eyes 0.97–1.02, vertex 0.43–0.48. **Rostrum:** length 2.75–3.04, reaching between fourth and sixth abdominal segments. **Antennae:** I, 1.22–1.66; II, 2.68–3.47; III, 1.37–1.76; IV, 0.95–1.17. **Pronotum:** mesal length 0.85–0.90, posterior width 1.51–1.71.

ETYMOLOGY: From the Latin, *dumus* (bramble, bush) and *-cola* (dweller), referring to its association with a variety of shrubby plant species.

DISCUSSION: *Phytocoris dumicola* is broadly distributed in the northwestern United States. Specimens have been collected as far south as Inyo Co., California; north in the Cascade Range to Hope, British Columbia; and east to Lincoln Co., Wyoming and Larimer Co., Colorado. This species also occurs in the central mountain highlands of Utah as far south as Washington County, and one specimen was collected near Sundance, Crook Co., Wyoming. The Sierra Nevada Mts. and Cascade Range form the western boundary of the distribution, but specimens have been taken west of these mountains at the following localities: 3 mi S Eel R. Rgr. Stn., Mendocino Co., California; Zena, Polk Co., Oregon; Spanaway, Pierce Co., Washington.

Phytocoris dumicola is most common in open forest situations where it occurs on a variety of understory shrubs. Adults have been collected from the following plants: *Ce-*

anothus integerrimus H.&A., *C. velutinus* Dougl., *Cercocarpus betuloides* Nutt., *C. ledifolius* Nutt., *C. montanus* Raf., *Crataegus douglasii* Lindl., *Purshia tridentata* (Pursh) DC., *Quercus gambelii* Nutt. and *Symphoricarpos longiflorus* A. Gray. Males and females have been collected at light.

ADDITIONAL SPECIMENS: 150 specimens were examined from the following localities: **CALIFORNIA.** **Alpine Co.:** Carson R., 8 mi S Markleeville (CAS). **El Dorado Co.:** 13 mi E Georgetown (UCB). **Inyo Co.:** 7 mi N Parcher's Camp (UCD). **Mariposa Co.:** Yosemite, 1183–1219 m (UCB). **Mendocino Co.:** Etsel Rdg., 3 air mi S Eel R. Rgr. Stn., 1128 m (UCB). **Modoc Co.:** Fandago Pass Smt., 1890 m (AMNH). **Mono Co.:** Mono Lk. (UCB); US Hwy. 395 at Mono Craters, 2188 m (AMNH); 4 mi E Monitor Pass (CAS). **Plumas Co.:** Johnsville (CAF&A). **Shasta Co.:** Castle Craigs St. Pk. (AMNH). **Siskiyou Co.:** McBride Spg., Mt. Shasta, 1524 m (UCB); Mt. Shasta City (UCB); Yreka (CAF&A). **Yosemite Nat. Pk.:** Clouds Rest, 3025 m (LACM). **COLORADO.** **Larimer Co.:** Estes Pk. (USNM). **IDAHO.** **Ada Co.:** 4 mi SE Boise (OSU). **Butte Co.:** Craters of the Moon Nat. Mon. (UID). **Latah Co.:** Genessee, 780 m (USNM); Moscow (UID, USNM); Moscow Mt., 915 m (USNM). **Nez Perce Co.:** Juliaetta, 610 m (USNM). **Washington Co.:** 16 mi NW Cambridge on St. Hwy. 71 (OSU). **MONTANA.** **Missoula Co.:** Missoula (USNM). **NEVADA.** **Elko Co.:** 8 mi S Wells (USNM). **Nye Co.:** Berlin, Ichthyosaur St. Mon., 2135 m (AMNH). **OREGON.** **Baker Co.:** Wallowa-Whitman Nat. For., T8S R45E Sec.11 (OSU). **Deschutes Co.:** Pringle Falls (OSU); 5 mi NW Sisters (UCB); 5 mi S Sisters, 1190 m (OSU). **Hood River Co.:** Hood River (USNM). **Jefferson Co.:** 10 mi W Sisters on US Hwy. 20 (OSU). **Klamath Co.:** Hayden Mt. Smt., W of Keno, 1475 m (AMNH); Sand Crk. (OSU); 0.5 mi E Parker Smt. on St. Hwy. 66, 1320 m (AMNH); 5 mi SE Keno (OSU). **Lake Co.:** 10 mi S Silver Lk. (UCB); 24 mi E LaPine (OSU). **Polk Co.:** Zena (OSU). **Wheeler Co.:** 4.5 mi S Mitchell on Prairie Simt. Rd. (AMNH); 33.4 mi E Prineville on US Hwy. 26 (OSU). **UTAH.** **Box Elder Co.:** Bear River City (USNM); Snowville (USU); 1 mi N Mantua (USU). **Cache Co.:** Green Cyn. Trail, 1980 m

(AMNH); Logan (KU, USU); Logan Cyn. (USU). **Davis Co.:** Farmington (USU). **Garfield Co.:** Bryce Cyn. Nat. Mon. (UCB). **Sevier Co.:** Fish Lk. (KU). **Summit Co.:** Beaver Crk., Kamas (CAS). **Uintah Co.:** Blue Mt. Plateau and Cliff Ridge, T5S R25E, 2440 m (AMNH); 7 mi N Vernal (USNM). **Utah Co.:** Spanish Fork (USU). **Wasatch Co.:** Dock Flat, 1 mi NE St. Hwy. 40, T2S R12W Sec. 9, 2440 m (AMNH). **Washington Co.:** Watchmen Cmpgd., Zion Nat. Pk., 1190 m (JTP); Red Cliff Rec. Area, near Leeds, 975 m (JTP). **WASHINGTON.** **Columbia Co.:** Dayton (USNM). **Kittitas Co.:** Cliffdell (KU). **Pierce Co.:** Spanaway (OSU). **Yakima Co.:** Naches (KU); Tampico (USNM); Tieton (OSU); Tieton Cyn. (USNM); Yakima (USNM). **WYOMING.** **Crook Co.:** Reuter Cyn. Cmp., 5 mi N Sundance, 1800 m (AMNH). **Lincoln Co.:** 10 mi E Alpine Jct. on US Hwy 26-89, near Wolf Crk. Cmpgd. (AMNH); 12 mi SE Smoot (USU). **BRITISH COLUMBIA.** Hope (KU). Collection dates are from May 9 to November 17.

A single female from the paratype series of *fraterculus* is conspecific with *dumicola*; label data: Fallen Leaf Lk., 1950 m, El Dorado Co., California, 26 October 1916, E. P. Van Duzee. This specimen now bears my identification label for *dumicola* and is deposited in the collection of the CAS.

Phytocoris lattini, new species

Figure 17

HOLOTYPE MALE: Corvallis, Benton Co., Oregon, 21 August 1959, taken at light, J. D. Lattin (AMNH).

PARATYPES: **CALIFORNIA.** **Contra Costa Co.:** 1 male, Walnut Crk., 15 June 1931, R. L. Usinger (USNM). **Siskiyou Co.:** 2 males, Mt. Shasta City, 13 August 1958, taken at light, J. Powell (UCB). **IDAHO.** **Bannock Co.:** 1 female, Lava Hot Springs, L. Maughan (USNM). **OREGON.** **Benton Co.:** 1 male, same data as holotype (AMNH); 1 male, same data as holotype except 28 September 1956 (OSU); 1 male, same data as holotype except 21 August 1958, ex. *Rosa* sp. (OSU); 1 male, same data as holotype except 23 August 1959 (CAS); 1 male, same data as holotype except 23 September 1968 (OSU); 2 males, 1 female, Corvallis, Crystal Lk. Cemetery, 27 July 1979, ex. *Salix* sp., G. M. Stonedahl (OSU); 1 male,

Corvallis, Willamette R., 18 August 1960, ex. *Salix* sp., J. D. Lattin (OSU); 21 females, Willamette Pk., 16 October 1980, ex. *Salix* sp., J. D. Lattin (AMNH, CAS, OSU, USNM); 3 females, Willamette R., 12 October 1977, ex. *Salix* sp., J. D. Lattin (OSU); 2 females, Willamette R., 1 mi S Corvallis, 12 October 1971, J. D. Lattin (OSU). **Linn Co.:** 2 females, Botany Farm, 1 mi E Corvallis, 26 October 1971, J. D. Lattin (OSU). **Polk Co.:** 1 male, Zena, 17 November 1960, taken at light, J. Fisher (OSU). **UTAH. Cache Co.:** 1 male, Logan Cyn., 18 August 1939, taken at light, G. F. Knowlton (USU); 1 male, River Heights, 3 September 1942, S. L. Wood (USNM).

DIAGNOSIS: *Phytocoris lattini* is distinguished from other species of the *aurora* group by the long first antennal segment, and sclerotized process of vesica extending above apex of right lobe of vesica. The ratio of length of antennal segment I to posterior width of pronotum is 1.10:1 to 1.20:1 for males and 1.15:1 to 1.25:1 for females.

DESCRIPTION: *Male.* Length 6.43–7.29, width 1.80–2.18; brownish gray general coloration. **Head:** width across eyes 1.04–1.10, vertex 0.28–0.32; pale yellow; buccula, jugum, lorum, and tylus marked with reddish brown or fuscous; frons moderately convex, meeting tylus along shallow depression, with 6–8 dark striae laterally. **Rostrum:** length 2.66–2.88, reaching fifth or sixth abdominal segment. **Antennae:** I, length 1.64–1.87, white or pale yellow with large fuscous markings; II, length 3.37–3.78, brownish yellow; III, length 1.67–1.85, brown or brownish yellow; IV, length 1.10–1.33, brown or brownish yellow. **Pronotum:** mesal length 0.77–0.86, posterior width 1.40–1.62; disk pale yellow or grayish yellow, tinged with brown, lateral margins sometimes more intensely darkened; posterior submargin of disk with transverse fuscous line and 4–6 weakly elevated points, extreme margin narrowly pale; collar and calli with reddish brown or fuscous markings; propleura fuscous, apical third pale. **Scutellum:** pale yellow, moderately to extensively darkened with brown or fuscous; pale median region broadening near apex; apex with two small, reddish marks. **Hemelytra:** pale yellow or grayish yellow, lightly tinged with brown and marked with scattered brown to fuscous

maculae particularly along veins, outer margin of corium, and margins of cuneus; cuneus sometimes with reddish markings along margins; membrane moderately to densely conspurcate, often with distinct pale areas medially. **Legs:** femora white or pale yellow with reddish brown or fuscous markings mostly on apical half; darkened regions of hind femora broken by pale spots; tibiae pale with reddish brown or fuscous markings; front and middle tibiae with three or four fuscous annuli, pale annuli on front tibiae as broad or broader than dark annuli. **Vestiture:** dorsum with dark, simple setae, black, scalelike setae, and silvery white, scalelike setae; legs and first antennal segment with long, pale, bristlelike, setae. **Genitalia:** Figure 17.

Female. Similar to male in color, vestiture, and structure, except wing membrane slightly shorter. Length 5.78–6.64, width 1.80–2.12. **Head:** width across eyes 1.01–1.05, vertex 0.42–0.44. **Rostrum:** length 2.95–3.06, reaching between fifth and seventh abdominal segments. **Antennae:** I, 1.65–1.80; II, 3.33–3.63; III, 1.76–1.85; IV, 1.22–1.31. **Pronotum:** mesal length 0.77–0.86; posterior width 1.39–1.53.

ETYMOLOGY: Named for John D. Lattin, Professor of Entomology, Oregon State University, Corvallis.

DISCUSSION: *Phytocoris lattini* is widely distributed in western Oregon and California; and also is known from Bannock Co., Idaho, and Cache Co., Utah. The host plant of this species appears to be *Salix*, although it may inhabit other deciduous trees as well. Males are attracted to light. Collection dates are from July 27 to October 16.

Phytocoris sagax Van Duzee
Figure 18

Phytocoris sagax Van Duzee, 1920: 352. – Carvalho, 1959: 215.

TYPES: *Phytocoris sagax* was described from a pair of specimens taken at Mt. Shasta City, Siskiyou Co., California, 24 July 1918, E. P. Van Duzee. The male holotype (no. 707) and allotype (no. 708) are deposited in the Van Duzee Collection (CAS).

DIAGNOSIS: Length 5.8–7.6. Similar to *angustatus* but distinguished by the absence of dark annuli on the middle tibiae (sometimes

with a single narrow band apically), structure of the male genitalia, and cuneus usually tinged with red. The dorsal process on the arm of the left paramere is small, broadly rounded, and well removed from the apex of the sensory lobe (fig. 18b, c). The right paramere is very large (fig. 18d), reaching to the base of the left paramere, and the sclerotized process of the vesica is short, and strongly tapered distally (fig. 18e).

DISCUSSION: *Phytocoris sagax* is widely distributed in the Sierra Nevada Mts. and Cascade Range as far north as Mt. Adams, Washington. It also occurs in the San Bernardino Mts. of southern California and throughout the Blue Mts. of northeastern Oregon. Specimens also were seen from Moscow Mt., Idaho. Adults have been collected from *Abies concolor* (Gord. & Glend.) Lindl. and *A. grandis* (Dougl.) Lindl., and several nymphs were reared from branches of *Larix occidentalis* Nutt. Males are attracted to light. I have examined 170 specimens with collection dates from July 14 to October 10.

***Phytocoris sanbernardino*, new species**

Figure 19

HOLOTYPE MALE: Mill Creek, San Bernardino Mts., 6000 ft (1830 m), San Bernardino Co., California, 2 October 1948, at light, Timberlake (UCR; donated to the AMNH).

PARATYPES: CALIFORNIA. **Riverside Co.:** 1 male, San Jacinto Mts., 21 July 1929, R. H. Beamer (KU).

DIAGNOSIS: Recognized by the pale annuli on fore tibiae as broad as or broader than dark annuli; ratio of length of antennal segment I to posterior width of pronotum from 0.85:1 to 0.90:1; and by the structure of the male genitalia: left genital tubercle broadly rounded apically (fig. 19a), arm of left paramere without dorsal process between sensory lobe and base of shaft (fig. 19b), right paramere with weak spines on inner surface, and primary membranous sac of vesica with large partly sclerotized bootlike sleeve originating near apex of basal process (fig. 19f).

DESCRIPTION: *Male.* Length 5.80–6.25, width 1.88–1.94; grayish brown general coloration. **Head:** width across eyes 0.94–0.95, vertex 0.37–0.38; pale yellow with reddish brown or fuscous markings on vertex, frons,

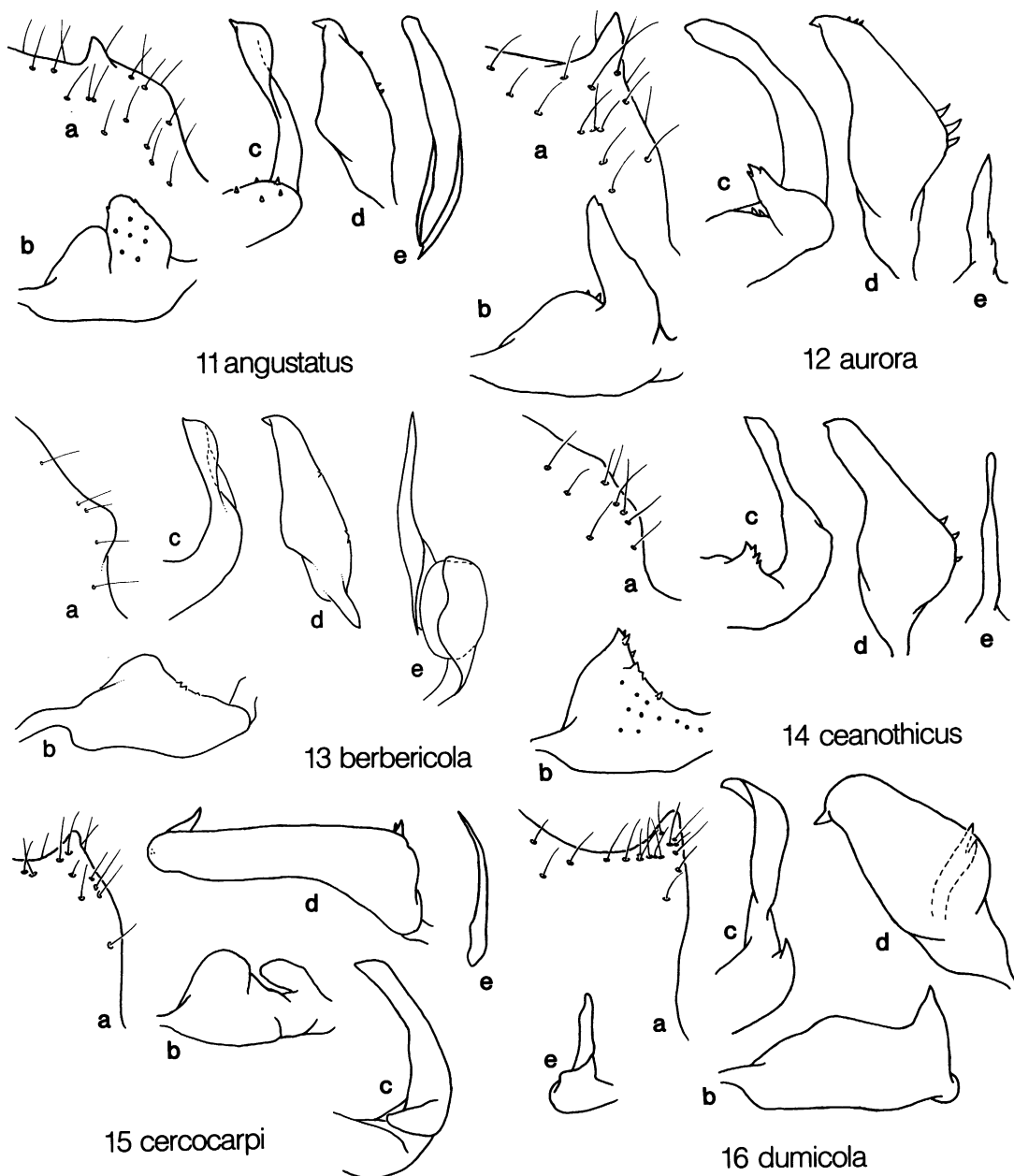
tylus, and upper margin of lorum; frons moderately convex, lacking distinct striae. **Rostrium:** length 2.48–2.65, reaching well beyond apices of hind coxae. **Antennae:** I, length 1.28–1.30, white with large fuscous maculae dorsally and laterally; II, length 2.85–3.00, yellowish brown; III, length 1.65–1.70, brown; IV, length 1.04, brown. **Pronotum:** mesal length 0.80–0.84, posterior width 1.42–1.50; disk grayish white, broadly darkened with brown laterally, lightly tinged with brown medially; posterior submargin of disk with wavy fuscous line, extreme margin narrowly pale; collar fuscous with pale spot medially; calli mottled with reddish brown or fuscous; propleura fuscous, apical third pale. **Scutellum:** grayish white with broad, longitudinal, fuscous stripe medially; extreme apex pale. **Hemelytra:** grayish white with extensive brown to fuscous markings, especially along veins, apex of corium, and margins of cuneus; membrane densely mottled with fuscous. **Legs:** femora pale yellow with reddish brown or fuscous markings mostly on distal half; tibiae pale with scattered dark maculae; fore tibiae with four dark annuli including narrow band at base, dark annuli narrower than intervening pale regions. **Vestiture:** as noted in group description. **Genitalia:** Figure 19.

Female. Unknown.

ETYMOLOGY: Named for the San Bernardino Mts. in southern California; a noun in apposition.

DISCUSSION: The genital parameres of *sanbernardino* are not typical of the *aurora* group, but rather seem more similar to those of *conspurcatus* group species (e.g., sensory lobe of left paramere without dorsodistal process, right paramere without strong spines on inner surface). However, the large, upright tubercle on the left margin of the genital aperture and the structure of the vesica are typical of other species treated here, thus warranting its placement in the *aurora* group. The sclerotized strap on the left primary lobe of the vesica of *sanbernardino* is strongly developed and tubular in design, rising well above the apices of the vesical lobes (fig. 19f).

Phytocoris sanbernardino is known only from the type material collected in the San Bernardino and San Jacinto Mts. of southern California. The host plant association is not known.



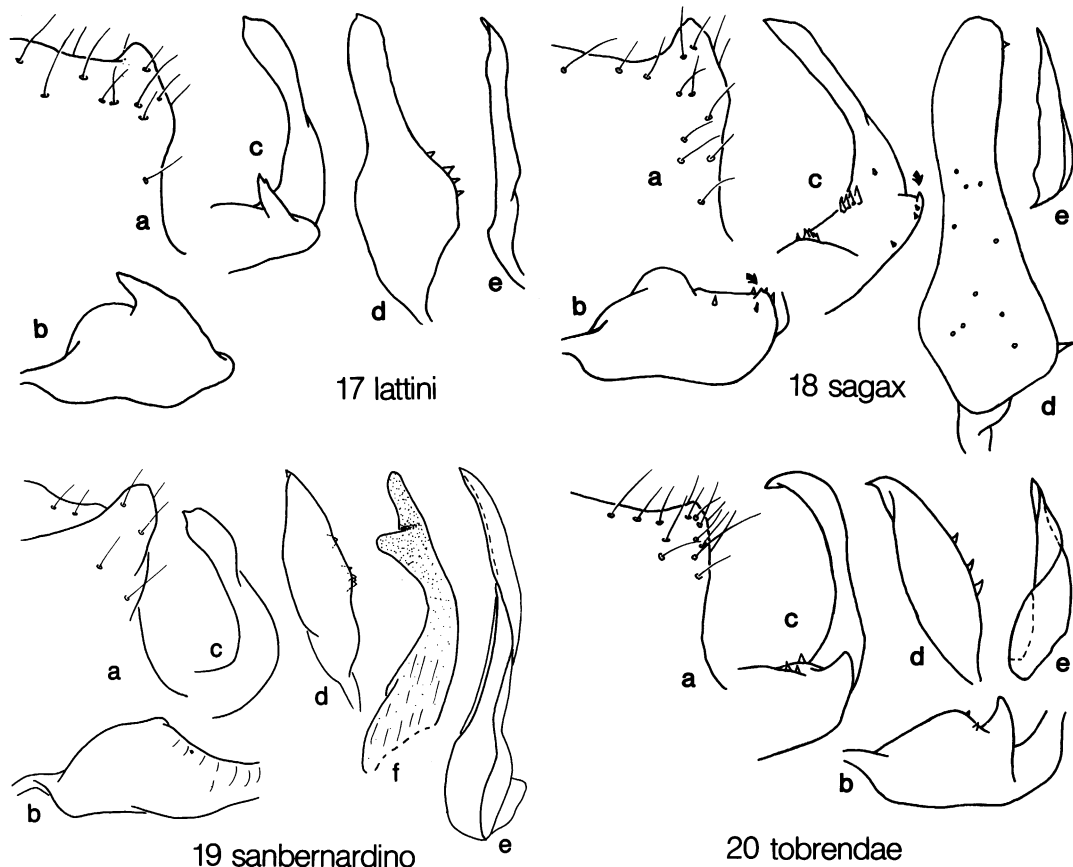
Figs. 11–16. Male genitalia of *aurora* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

***Phytocoris tobrendae*, new species**

Figure 20

HOLOTYPE MALE: Lee Cyn., 39 mi NW of Las Vegas, Clark Co., Nevada, 28 July 1966, 2256 m, F.P., and M. Rindge (AMNH).

PARATYPES: CALIFORNIA. **Mono Co.:** 1 male, Blanco's Corral, White Mts., 3048 m, 23 July 1953, D. D. Lindsdale (UCB); 2 males, Crooked Crk., White Mts., 27 July 1961, J. S. Buckett (CAF&A). **NEVADA. Clark Co.:**



Figs. 17–20. Male genitalia of *aurora* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica. f. Distally sclerotized, bootlike sleeve of primary membranous sac of vesica (*sanbernardino* only).

2 males, 1 female, same data as holotype (AMNH). **White Pine Co.:** 2 males, 2 females, 8.3 mi N US Hwy. 50 on Steptoe Crk. Rd., 2393 m, 19 July 1980, ex. *Cercocarpus ledifolius* Nutt., G. M. Stonedahl and R. T. Schuh (OSU, USNM); 2 females, Lehman Crk. Cmpgd., Humboldt Nat. For., 2286 m, 12 August 1980, ex. *Cercocarpus ledifolius*, G. M. and J. A. Stonedahl (AMNH, OSU). **UTAH. Emery Co.:** 1 male, 1 female, 13.2 mi NW Jct. St. Hwy. 10 on St. Hwy. 31, 2180 m, 17 July 1980, ex. *Cercocarpus ledifolius*, G. M. Stonedahl and R. T. Schuh (CAS). **Sevier Co.:** 1 male, 1 female, 2.3 mi N Int. Hwy. 70 on Rd. to Kanosh, 2128 m, 16 July 1980, ex. *Cercocarpus ledifolius*, G. M. Stonedahl and R. T. Schuh (OSU).

DIAGNOSIS: *Phytocoris tobrendae* closely resembles *dumicola* but is distinguished by the structure of the male genitalia. The dorsal process on the arm of the left paramere is only narrowly removed from the apex of the sensory lobe (fig. 20b). The right paramere is narrower with three or four stout spines on the inner-dorsal surface (fig. 20d), and the sclerotized process of the vesica is much larger (fig. 20e).

DESCRIPTION: Male. Length 6.48–7.51, width 2.03–2.34; brownish gray general coloration. **Head:** width across eyes 1.04–1.12, vertex 0.31–0.35; pale yellow; base and middle of tylus, buccula, jugum, and lorum marked with reddish brown or fuscous; frons weakly convex, meeting tylus along shallow

depression, pale medially with fuscous markings laterally. **Rostrum:** length 2.99–3.24, reaching sixth or seventh abdominal segment. **Antennae:** I, length 1.22–1.53, white or pale yellow with large fuscous markings; II, length 3.15–3.62, brown or yellowish brown; III, length 1.26–1.51, brown to fuscous; IV, length 0.86–0.95, brown to fuscous. **Pronotum:** mesal length 0.86–1.01, posterior width 1.57–1.73; disk pale gray or grayish yellow, deeply tinged with brown or fuscous, lateral margins usually more intensely darkened with fuscous; posterior submargin of disk with transverse fuscous band and 4–6 weakly elevated points, extreme margin narrowly pale; collar fuscous with pale median spot; calli mottled with reddish brown or fuscous; propleura fuscous, apical third pale. **Scutellum:** extensively tinged and marked with brown or fuscous; apex broadly pale and marked with two reddish brown to fuscous parallel stripes. **Hemelytra:** grayish white with extensive brown to fuscous markings; inner margin of clavus, middle and apex of corium, and base of cuneus with distinct pale regions; membrane densely conspurcate. **Legs:** femora white or pale yellow with reddish brown or fuscous markings mostly on apical half; hind femora extensively darkened and marked with pale spots, anterior margin usually with three or four large pale maculae; tibiae pale with reddish brown or fuscous

markings; front and middle tibiae with three or four dark annuli, those on front tibiae distinctly broader than pale annuli. **Vestiture:** dorsum with long, dark, simple setae, black, scalelike setae, and silvery white, scalelike setae. **Genitalia:** Figure 20.

Female. Similar to male in color, vestiture, and structure. Length 6.48–6.70, width 2.10–2.16. **Head:** width across eyes 0.99–1.04, vertex 0.42–0.45. **Rostrum:** length 3.11–3.20, reaching well beyond apices of hind coxae. **Antennae:** I, 1.33–1.39; II, 3.01–3.18; III, 1.26–1.35; IV, 0.81–0.90. **Pronotum:** mesal length 0.90–0.94, posterior width 1.57–1.66.

ETYMOLOGY: Named for my good friends Toby Schuh and Brenda Massie.

DISCUSSION: *Phytocoris tobrendae* is widely distributed in the Intermountain Sagebrush Province of eastern California, Nevada, and western Utah at elevations between 2100 and 3100 m. It also occurs on the Wasatch Plateau of central Utah. In the northern portion of the Intermountain Sagebrush Province (northern California, eastern Oregon, eastern Washington, southern Idaho), and the northern Wasatch Plateau, *tobrendae* seems to be replaced by the allied species, *dumicola*. Nymphs and adults of *tobrendae* have been collected on *Cercocarpus ledifolius* Nutt. Several males also were taken at light. The period of occurrence is from July 16 to August 12.

CANDIDUS SPECIES-GROUP

DIAGNOSIS: Similar to *pulchricollis* group species with strongly produced tylus base (fig. 22), broad vertex, medial sulcus on abdominal sternites 2–7, and long first segment of metatarsus, but distinguished by the more elongate body form of the male, broader scalelike setae on the venter (fig. 23), and structure of the male genitalia, especially the form of the sclerotized process of the vesica, and genital capsule, except *suavis*, without tubercles above paramere bases.

DESCRIPTION: Small to moderate size, 4.2–6.5, elongate, pale species, sometimes with limited fuscous markings; vestiture of dorsum with suberect, simple setae and narrow to relatively broad, silvery white, scalelike

setae; *albidosquamus* and *squamosus* also with scattered dark, scalelike setae; venter, except *suavis*, with dense covering of pale, scalelike setae. **Head:** antennae pale yellow to fuscous; segment I sometimes with dense brush of long pale setae on ventral surface; frons prominent, deflexed apically, meeting tylus along deep depression; tylus strongly produced at base; eyes elliptical to slightly reniform. **Pronotum:** disk pale, sometimes lightly marked or tinged with red to fuscous especially near calli, posterior submargin sometimes with wavy, fuscous band or series of dark spots; propleura pale, sometimes with limited reddish brown or fuscous markings anteriorly. **Hemelytra:** grayish white or pale

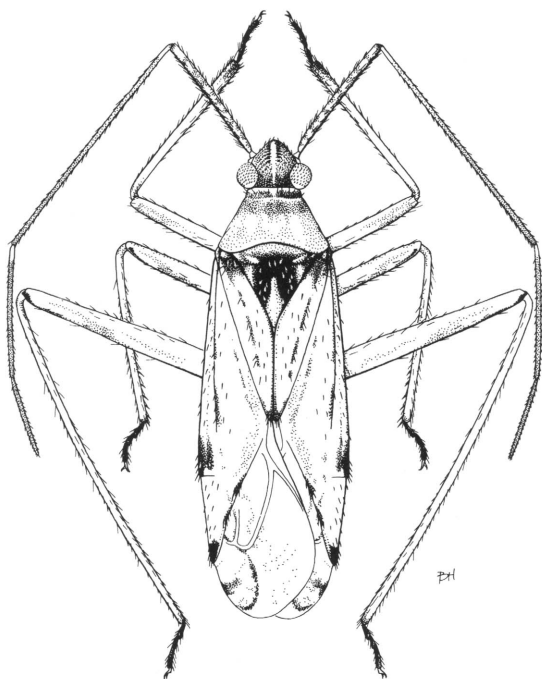


Fig. 21. *Phytocoris squamosus*, dorsal habitus of male.

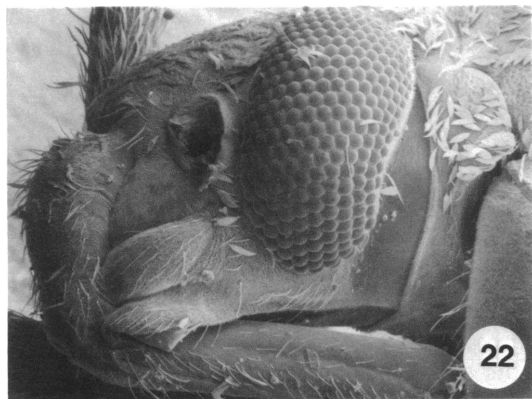
brownish yellow with limited fuscous markings mostly along veins, inner margin and posterolateral angle of corium, and inner margin of cuneus; hemelytra of *candidus* uniformly pale yellow; membrane conspurcate, spots coalescing distally. **Legs:** femora white or pale yellow, lightly to moderately marked with fuscous, except uniformly pale in *candidus*; tibiae pale with fuscous spots, front pair sometimes with two or three dark annuli. **Male genitalia:** genital capsule without tubercles above parameres bases, or with small angulate or knoblike protuberance near base of left paramere only. *Left paramere:* sensory lobe moderately to strongly produced; angle sharp; shaft curving dorsad basally, slightly expanded distally in dorsal view; inner surface of arm and base of shaft sometimes with small spines or tubercles; apex acute or narrowly truncate in lateral view. *Right paramere:* elongate, lance-shaped; distal region of shaft sometimes strongly narrowed, apex acute. *Vesica:* primary membranous sac greatly reduced; basal lobes well developed; basal process indistinct or weakly developed and continuous with base of sclerotized pro-

cess; sclerotized process variable in size and shape; sometimes distinctly coiled, at least basally.

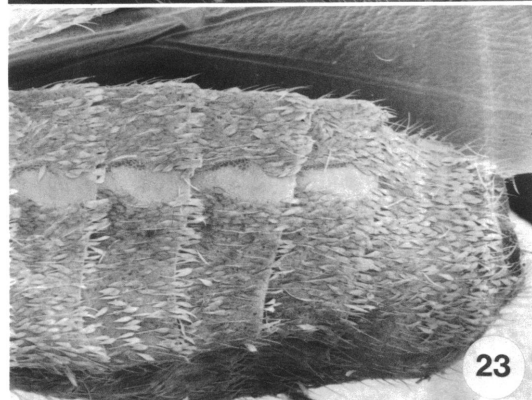
DISCUSSION: The *candidus* group comprises four species distributed in the arid southwestern United States. The northernmost records are from Harney County, Oregon in the northwestern corner of the Intermountain Sagebrush Province. The host plant associations of these species are poorly known, with the exception of *squamosus*, which occurs on *Ephedra* throughout much of its distribution. This species and *albidosquamus* have been taken infrequently on several common shrubs of the desert and Great Basin. Nymphs of *candidus* were found on *Tetradymia* in San Diego Co., California, suggesting that it is a breeding host of the species. The males of all *candidus* group species have been collected at light; females are slightly to strongly brachypterous and probably do not fly.

KEY TO SPECIES OF THE *CANDIDUS* GROUP

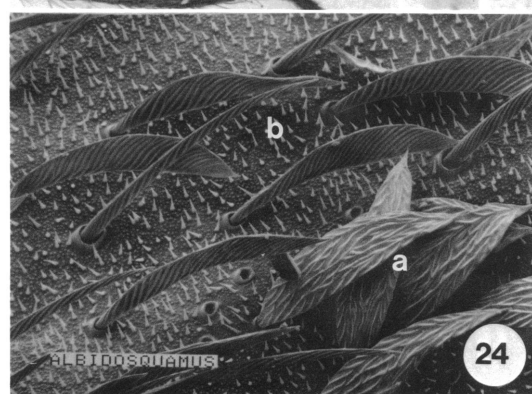
- 1 Dorsal surface with narrow, dark brown or black, scalelike setae 2
Dorsal surface without dark scalelike setae 3
- 2(1) Antennal segment I densely set with long, pale setae on ventral surface; pronotal collar and calli tinged or marked with red or reddish brown; sclerotized process of vesica long and gradually tapered (fig. 27e) *squamosus* Knight
Antennal segment I with short, sparsely distributed setae on ventral surface; pronotal collar and calli marked with fuscous; sclerotized process coiled, continuous with basal process (fig. 25e) *albidosquamus* Knight
- 3(1) Hemelytra with limited brown or fuscous markings, mostly on outer half of clavus and along inner margin of corium; scutellum with pale median line, bordered by fuscous; antennal segment I with scattered pale setae ventrally; genital capsule of male with angulate protuberance above base of left paramere (fig. 28a) ... *suavis* (Reuter)
Hemelytra uniformly pale yellow, without dark markings; scutellum without pale median line; antennal segment I with dense brush of long, pale setae ventrally; genital capsule of male without protuberance above base of left paramere (fig. 26a) ... *candidus* (Van D.)



22



23



24

Figs. 22–24. *Phytocoris albidosquamus*. 22. Lateral view of head. 23. Lateral view of abdomen. 24. Dorsal vestiture: a, white scalelike setae; b, black scalelike setae.

Phytocoris albidosquamus Knight
Figures 22–25

Phytocoris albidosquamus Knight, 1968: 232–234, fig. 286.

TYPES: Described from 11 specimens collected in Esmeralda, Nye, and Washoe coun-

ties, Nevada. The male holotype was taken in Area TM, Nevada Test Site, Nye Co., 14 June 1965, D. E. Beck, H. H. Knight, and J. M. Merino. The holotype and two male paratypes are retained in the Knight Collection (USNM); two female paratypes are deposited in the UCB collection; and one male paratype is deposited in the collection of BYU. The remaining five paratypes were not located. Knight did not designate an allotype for this species.

One female with the following label data also was examined: 6 mi N Goldfield, 5300 ft (1615 m), Esmeralda Co., Nevada, 8 June 1966, W. Gagne (UCB). Although this specimen bears a Knight paratype label, it was not included in the original description of the species.

DIAGNOSIS: Length: Male 5.3–6.5, female 4.4–4.8. Recognized by the mixed dorsal vestiture, which includes dark scalelike setae; fuscous markings on collar and calli; short, sparsely distributed setae on ventral surface of antennal segment I; and structure of the male genitalia, in particular the broadly expanded distal region of the shaft of the left paramere (fig. 25c), and the coiled sclerotized process of the vesica (fig. 25e).

DISCUSSION: *Phytocoris albidosquamus* is distributed throughout the Intermountain Sagebrush Province of Nevada and western Utah, and occurs across the Uintah Basin to Rio Blanco Co., Colorado. The distribution also includes much of the arid southeastern region of California from San Diego County north to Inyo County. Several specimens have been collected in Maricopa Co., Arizona, and Harney Co., Oregon as well. Collection dates are from April 7 to August 25. Adults have been collected on *Artemisia tridentata* Nutt., *Atriplex confertifolia* (Torr. & Frem.) Wats., *A. polycarpa* (Torr.) Wats., and *Sarcobatus vermiculatus* (Hook.) Torr. Males are attracted to light. The female is strongly brachypterous with the wing membrane reduced to a narrow flap.

Slight variation is seen in the structure of the genital parameres of *albidosquamus*, but this does not appear to be correlated with geography or minor variation in external morphology. The width of the shaft of the right paramere is especially variable as is the size of the expanded distal region of the shaft

of the left paramere. Knight (1968) incorrectly figured the left paramere of this species with a large angulate sensory lobe. All males examined in this study, including the holotype and available paratypes, had the sensory lobe broadly rounded as in figure 25b.

Phytocoris candidus (Van Duzee)

Figure 26

Pallacocoris candidus Van Duzee, 1918: 288, 289.

– Carvalho, 1959: 184.

Phytocoris candidus: Knight, 1968: 215 (n. comb.).

TYPES: This species was described from 14 specimens collected at Coachella and Palm Spgs., Riverside Co., California, E. P. Van Duzee. The male holotype was taken at Palm Spgs. on 21 May 1917. The holotype (no. 408), allotype (no. 409), and 10 paratypes are retained in the Van Duzee Collection (CAS); two paratypes are deposited in the Knight Collection (USNM).

DIAGNOSIS: Length 4.8–5.6. Distinguished from other species of the *candidus* group by the uniformly pale yellow general coloration; dorsum without fuscous markings or dark scalelike setae; and antennal segment I with dense brush of long pale setae ventrally. The membranous portion of the vesica is greatly reduced, and the sclerotized process is small and flattened (fig. 26e).

DISCUSSION: This species is distributed in the arid southeastern portion of California. In addition to type material, 23 specimens of *candidus* were examined from the following localities: **Riverside Co.:** 2.5 mi S Palm Desert on St. Hwy. 74 (UCR). **San Diego Co.:** Anza-Borrego Desert St. Pk., Rt. S2, Carrizo Crk., 10.2 mi NW Ocotillo and near Bow Willow Jct., 300 m (AMNH); Borrego (UCR). **County ?:** Dead Indian Crk. (UCR). Adults have been collected on *Dalea spinosa* Gray., *Hymenoclea salsola* T.&G., and *Tetradymia* sp. Collection dates are from March 29 to May 23.

Phytocoris squamosus Knight

Figures 21, 27

Phytocoris squamosus Knight, 1934: 11–13. – Carvalho, 1959: 217. – Knight, 1968: 215.

TYPES: Described from 12 specimens collected in Arizona and California. The male

holotype and four male paratypes were taken at Bowie, Cochise Co., Arizona, 15 July 1916, H. H. Knight. The holotype, allotype, and seven paratypes are retained in the Knight Collection (USNM). One paratype is deposited in the collection of the CAS; two paratypes were not located.

DIAGNOSIS: Length: male 4.9–5.9, female 4.2–5.0. Most similar to *albidosquamus* but differs by the dense brush of long, pale setae on the ventral surface of antennal segment I, red or reddish brown markings on the collar and calli, and by the structure of the male genitalia, especially the long, gradually tapered sclerotized process of the vesica (fig. 27e). This species is distinguished from *candidus* and *suavis* by the dark scalelike setae on the dorsum, and by the structure of the male genitalia, particularly the large sclerotized process of the vesica.

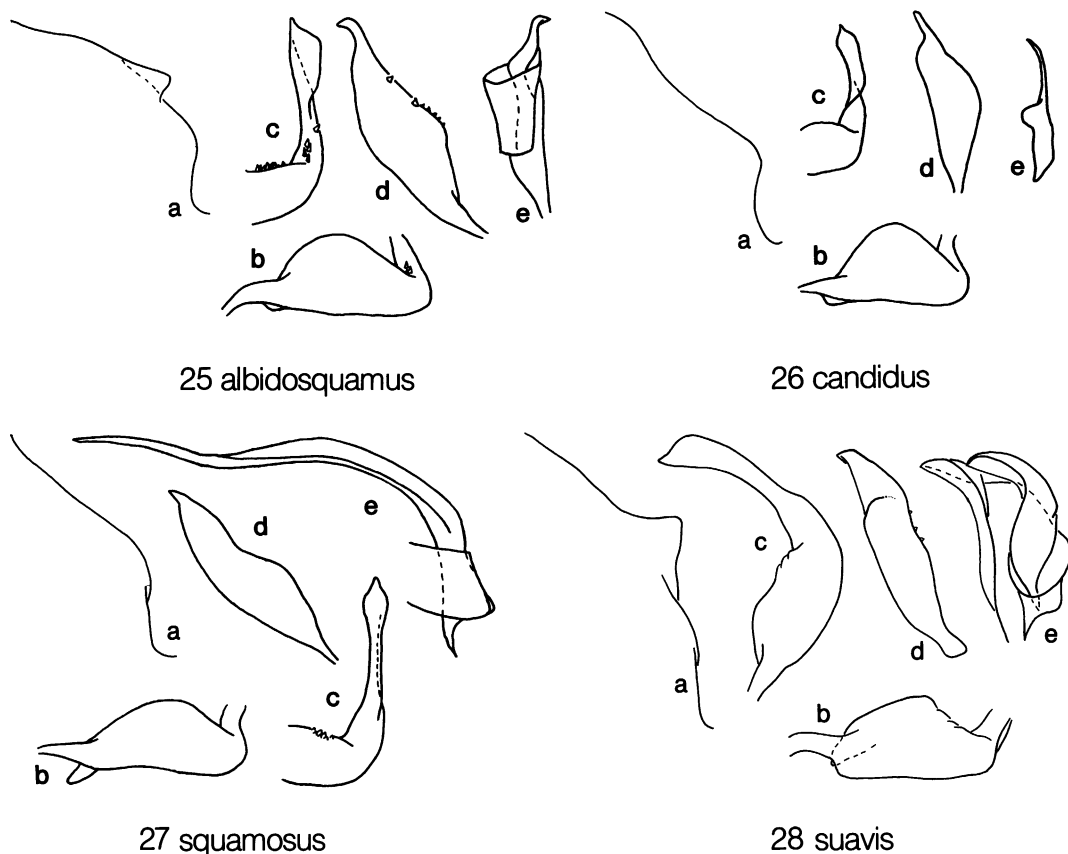
DISCUSSION: *Phytocoris squamosus* is widely distributed in Arizona, Nevada, western Utah, southern New Mexico, and southwestern Texas, but is uncommon in the desert regions of extreme southern Nevada and southwestern Arizona. In Utah, the distribution extends east to the central mountain highlands and to near the Colorado border in Uintah County. This species also occurs in Kern and Inyo counties, California, and Harney Co., Oregon. It has been collected on *Atriplex*, *Krameria*, and *Prosopis*, but is most commonly an inhabitant of *Ephedra*. Males are attracted to light. The wing membrane is slightly reduced in the female; reaching or slightly beyond the apex of the abdomen. Collection dates are from April 26 to September 13.

Phytocoris suavis (Reuter),
new combination

Figure 28

Pallacocoris suavis Reuter, 1876: 62. – Van Duzee, 1917a: 336. – Carvalho, 1952: 91; 1955: 86; 1959: 184.

TYPES: This species was described from an unknown number of specimens collected in Texas. I have examined a male individual with label data matching that provided by Reuter in the original description. This specimen is deposited in the Swedish Museum of Natural History and bears a red “Typus” la-



Figs. 25–28. Male genitalia of *candidus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

bel that was added subsequent to the description of the species by museum staff. There is no evidence that this is a unique specimen and not part of a syntype series. However, it is the only such specimen that I have been able to locate and is here designated lectotype for the species.

DIAGNOSIS: Length 5.00–5.58. Recognized by the dorsal vestiture consisting of golden to brown simple setae and narrow, silvery white, scalelike setae; antennal segment I with scattered, long, bristlelike setae on ventral aspect; pronotum and scutellum usually with pale line medially bordered by fuscous; hemelytra with limited brown or fuscous markings, mostly on other half of clavus and along inner margin of corium, and with membrane moderately to densely conspurcate; and structure of the male genitalia, especially the

angulate protuberance on the genital capsule above the base of the left paramere (fig. 28a), and the coiled sclerotized process of the vesica (fig. 28e).

DISCUSSION: I have examined 27 specimens from the following localities: **TEXAS:** **Brazos Co.:** Bryan and College Station (AMNH, TA&M, USNM). **Dallas Co.:** Plano (USNM). **Hidalgo Co.:** Mission (KU). Collection dates are from May 7 to December 26. This species also is reported from Iowa (Carvalho, 1959), but I have not seen material from that region. The host plant association of *suavis* is not known. The majority of specimens examined from Brazos County were collected at light.

Although *suavis* lacks two defining characters of the *candidus* group (i.e., venter with dense mat of scalelike setae, long first seg-

ment of metatarsus), its placement here is justified by the external morphology of the head and pronotum, and the structure of the male genitalia (e.g., coiled sclerotized process

of vesica), which are very similar to other *candidus* group species, especially *albidosquamus*.

CARNOSULUS SPECIES-GROUP

DIAGNOSIS: Recognized by the small size, males 4.6–6.5, females 3.4–4.2 (strongly brachypterous); short first antennal segment; long rostrum; strongly tapered hind femora with basal region greatly expanded; apices of front tibiae pale; and structure of the male genitalia, especially the reduced membranous lobes of the vesica and the small sclerotized protuberance above the posterior margin of the secondary gonopore. Externally, *carnosulus* group species are very similar to members of the *listi* group but can be distinguished by the jugum not swollen to same degree as lorum; hemelytra without black, bristlelike setae; strongly broadened bases of hind femora; pale apices of front tibiae; and structure of the male genitalia; especially the sclerotized process of the vesica without strong marginal serrations.

DESCRIPTION: Yellowish brown or brown species with golden to brown, simple setae and narrow, silvery white, sericeous setae. **Head:** antennae brownish yellow to dark brown, segment I pale with brown to fuscous markings dorsally, length of segment I less than, to slightly greater than, width of head across eyes; frons moderately produced, meeting tylus along broad depression, sometimes with several faint reddish or fuscous striae; lorum moderately swollen; eyes obovate, occupying one-half to two-thirds of head height. **Pronotum:** disk pale with limited brown markings; collar and propleura mostly fuscous, apical third of collar pale; calli weakly elevated, indistinct. **Hemelytra:** creamy white or pale grayish yellow, lightly to moderately marked with brown or fuscous; posterior region of corium and base of cuneus sometimes with pinkish tinge; distal half of cuneus mostly fuscous, extreme apex pale; membrane smoky, sometimes with faint dark maculae, veins dark, pale distally. **Legs:** femora pale with brown to fuscous markings mostly on distal half, pattern somewhat reticulate on hind pair; hind femora strongly tapered, basal region greatly expanded, distal

half, except *carnosulus*, with long, erect, pale setae; tibiae pale with four dark annuli, except banding obscured for *presidio*, apices of all tibiae pale; at least basal half of hind tibiae, except *carnosulus*, with long, erect setae. **Male genitalia:** genital capsule with well developed tubercle above base of left paramere. **Left paramere:** sensory lobe moderately to strongly produced, ventral margin of arm slightly concave; shaft narrow, slightly expanded distally, apex truncated. **Right paramere:** elongate, or slightly to moderately expanded beyond middle; narrow region before apex weakly sclerotized; apex acute. **Vesica:** primary membranous sac reduced, with small platelike sclerite dorsad of posterior margin of gonopore; basal lobes strongly developed; basal process well sclerotized, reaching level of gonopore or slightly beyond, and appearing continuous with base of sclerotized process; sclerotized process variable, flattened with reflexed margins for *carnosulus* and *chemehuevi*, bulbous basally and distally tapered for *presidio*; *carnosulus* with small lobal sclerite on apex of left primary lobe.

DISCUSSION: The *carnosulus* group comprises three species distributed in the southwestern United States from Modoc and San Bernardino counties in California, south and east to Randall and Sutton counties, Texas. The host plant associations of these species are entirely unknown. Males of *carnosulus* and *presidio* have been taken at light. The female of *carnosulus* is strongly brachypterous. The females of *presidio* and *chemehuevi* are unknown.

KEY TO SPECIES OF THE *CARNOSULUS* GROUP

- 1 Length of antennal segment I distinctly less than width of head across eyes, ratio from 0.70:1 to 0.80:1 *presidio* n. sp.
Length of antennal segment I equal to or greater than width of head across eyes 2
- 2(1) Lower margin of antennal fossa at level of ventral margin of eye; distal half of hind

femora and basal half of tibiae with long, erect, pale setae; genital capsule of male with narrow, cylindrical tubercle above base of left paramere (fig. 32a)

..... *chemehuevi* n. sp.

Lower margin of antennal fossa well above ventral margin of eye (fig. 29); hind legs without long, pale setae; genital capsule of male with short, broad tubercle above base of left paramere (fig. 31a)

..... *carnosulus* Van D.

Phytocoris carnosulus Van Duzee

Figures 29–31

Phytocoris carnosulus Van Duzee, 1920: 347, 348.
– Carvalho, 1959: 193. – Knight, 1968: 229.

TYPES: In the original description of *carnosulus*, Van Duzee states that the type series comprised two male and two female examples taken at Prescott, Arizona, July 1, 1917, C. A. Hill. I have examined four specimens from the type locality, all bearing Van Duzee type labels: holotype male (no. 697), 8 July 1917 and three male paratypes, 7–8 July 1917. These specimens are retained in the Van Duzee Collection (CAS) except one paratype is deposited in the Knight Collection (USNM). The two female specimens, including the allotype (no. 698), were not located. Obviously, the number of specimens in the type series and the collection dates do not match the information given by Van Duzee in the original description.

DIAGNOSIS: Length: male 4.8–6.5, female

3.4–4.2. Distinguished from *chemehuevi* and *presidio* by the larger average size; lower margin of the antennal fossa well above ventral margin of eye (fig. 29); hind legs without long, pale setae; and by the structure of the male genitalia, especially the form of the sclerotized process of the vesica (figs. 31e) and left primary lobe of vesica with large apical sclerite (fig. 31f). This species is further distinguished from *presidio* by the longer first antennal segment.

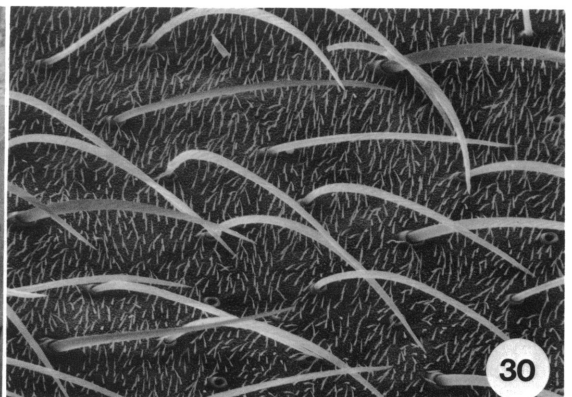
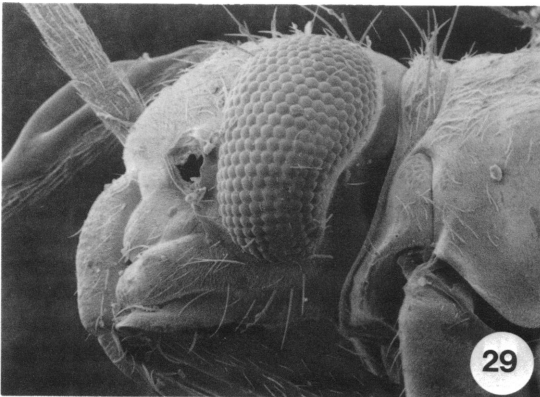
DISCUSSION: *Phytocoris carnosulus* is widely distributed in Arizona, New Mexico, southern Nevada, southern Utah, and western Texas. Specimens have been collected as far north as Modoc Co., California (westernmost record), Lander Co., Nevada and Tooele Co., Utah; and east to Randall and Sutton counties in Texas. The host plant association is not known. Males are attracted to light. I have examined several hundred specimens with collection dates from April 11 to October 14. The female of *carnosulus* is strongly brachypterous.

Phytocoris chemehuevi, new species

Figure 32

HOLOTYPE MALE: 3 mi NW of Vidal, San Bernardino Co., California, 17 March 1967, D. C. Rentz (UCB).

DIAGNOSIS: Similar to *carnosulus* but distinguished by the smaller size; lower margin of antennal fossa at level of ventral margin

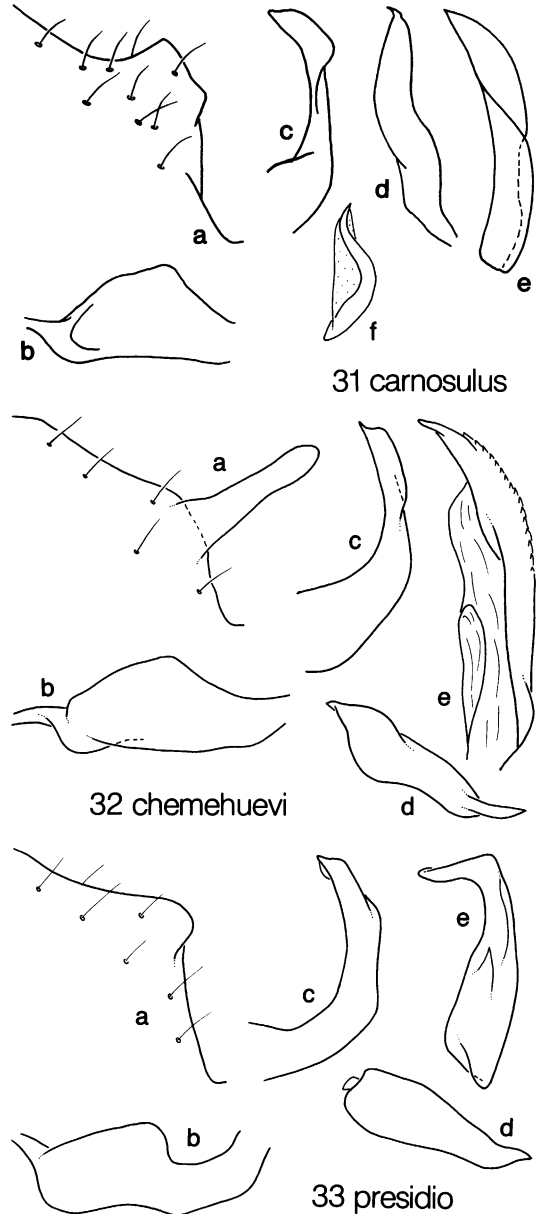


Figs. 29, 30. *Phytocoris carnosulus*. 29. Lateral view of head. 30. Dorsal vestiture.

of eye; hind legs with long erect setae; and by the structure of the male genitalia, especially the narrow cylindrical tubercle above base of the left paramere (fig. 32a). This species is readily separated from *presidio* by the length of antennal segment I equal to or greater than head width, and by the elongate genital tubercle of the male.

DESCRIPTION: *Male.* Length 4.65, width 1.48; pale grayish yellow ground color with brown to fuscous markings. **Head:** width across eyes 0.86, vertex 0.35; pale yellow with dark reddish brown markings on ventral margin of jugum and lower borders of antennal fossa, buccula, gena, base of lorum, and behind ventral margin of eye; frons moderately convex, lightly tinged with red; lower margin of antennal fossa even with ventral margin of eye; eye occupying approximately half of head height. **Rostrum:** length 2.65, nearly reaching base of ninth abdominal segment. **Antennae:** I, length 0.94, pale with large dark brown patches dorsally and 6–8 erect pale bristlelike setae; II, length 1.87, yellowish brown; III, length 0.84, dark brown, narrowly pale at base and apex; IV, teneral, dark brown. **Pronotum:** mesal length 0.75, posterior width 1.34; disk uniformly grayish yellow; collar mostly fuscous, narrowly pale medially; calli weakly elevated, indistinct; propleura fuscous, distal third white. **Scutellum:** weakly convex; fuscous, apex and anterolateral angles pale; mesoscutum yellowish with dark triangular mark dorsally at junction with scutellum. **Hemelytra:** grayish yellow ground color; clavus and inner half of corium broadly tinged with brown; clavus bordering commissure and posteromedial region of corium with faint pinkish tinge; embolium marked with fuscous; cuneus fuscous, basal third and extreme apex white; membrane smoky, veins dark. **Legs:** femora pale yellow with brown reticulate markings mostly on distal half of segment; distal half of hind tibiae with scattered erect pale bristlelike setae; tibiae pale with four dark annuli including narrow band at base, basal half of hind tibiae with long erect bristlelike setae; tarsi yellowish brown. **Vestiture:** dorsum with golden to brown, simple setae and silvery white, sericeous setae. **Genitalia:** Figure 32.

Female. Unknown.



Figs. 31–33. Male genitalia of *carnosulus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica. f. Lobal sclerite of vesica (*carnosulus* only).

ETYMOLOGY: Named for the Chemehuevi Indians, a noun in apposition.

DISCUSSION: Known only from the holo-

type collected near Vidal, San Bernardino Co., California. The female and host plant association of *chemehuevi* are unknown.

Phytocoris presidio, new species

Figure 33

HOLOTYPE MALE: Shafter, Presidio Co., Texas, 30 May 1970, Hafernik and Murray (TA&M; donated to the AMNH).

PARATYPES: 1 male, same data as holotype except 22 June 1968, taken at black light, J. E. Hafernik (TA&M).

DIAGNOSIS: Distinguished from *carnosulus* and *chemehuevi* by the short first antennal segment, and structure of the male genitalia, particularly the sclerotized process of the vesica (fig. 33e). The length of antennal segment I is distinctly less than the head width across the eyes; ratio from 0.70:1 to 0.80:1.

DESCRIPTION: *Male.* Length 4.70–4.92, width 1.53–1.59; creamy white to pale yellow ground color with limited reddish brown and fuscous markings. **Head:** width across eyes 0.94–0.96, vertex 0.37–0.39; creamy white or pale yellow; vertex, base of tylus, lower margin of jugum, base of lorum, gena, and head behind ventral margin of eye marked with red or dark reddish brown; frons moderately convex, meeting tylus along broad shallow depression, marked with 6–8 obscure reddish striae; lower margin of antennal fossa situated slightly above ventral margin of eye; eye occupying approximately two-thirds of head height. **Rostrum:** length 3.00–3.04, reaching slightly beyond base of ninth abdominal segment. **Antennae:** I, length 0.68–0.74, pale yellow with fuscous patches dorsally and four or five erect bristlelike setae, dorsal surface also with scattered red markings, ventral surface mostly pale; II, length 1.79–1.87, brown-

ish yellow, tinged with red basally and medially; III, length 0.81–0.91, brown or yellowish brown; IV, length 0.90, brown or yellowish brown. **Pronotum:** mesal length 0.75–0.79, posterior width 1.33–1.38; creamy white or pale grayish yellow; collar infuscated, narrowly pale medially; collar dorsally, anterior margin of calli, and posterior lobe of disk behind calli lightly marked or tinged with red; calli weakly elevated, indistinct; propleura mostly darkened with reddish brown and fuscous, distal third white. **Scutellum:** grayish or brownish yellow with fuscous markings laterally and dorsomedially; mesoscutum mostly pale. **Hemelytra:** creamy white or pale grayish yellow with limited brown or fuscous markings; embolium, posteromedial angle of corium, and inner margin and apex of cuneus with strongly contrasting dark reddish brown or fuscous markings; membrane tinted with brown, veins dark basally, pale distally. **Legs:** femora white or pale yellow basally, brownish yellow distally, marked with reddish brown or fuscous mostly on apical half, pattern somewhat reticulate on hind pair; front and middle tibiae with 2–4 reddish annuli, proximal one or two bands obscured; hind tibiae and distal half of hind femora with long, erect bristlelike setae; tarsi brownish yellow. **Vestiture:** dorsum with golden to brown, simple setae and silvery white, sericeous setae. **Genitalia:** Figure 33.

Female. Unknown.

ETYMOLOGY: Named for the county in Texas where the holotype and single paratype were collected; a noun in apposition.

DISCUSSION: Known only from the type material collected at light in Presidio Co., Texas. The female and host plant association of this species are unknown.

CONSPURCATUS SPECIES-GROUP

DIAGNOSIS: Recognized by the brown or grayish brown general coloration; short head with large eyes (fig. 34); antennal segment II with pale median annulus; dorsum with two types of broad, asymmetrical, scalelike setae (fig. 35); and the structure of the male genitalia, especially the tapered, cylindrical genital tubercles, and vesica with broad, flat-

tened, lance-shaped sclerotized process (figs. 1, 4).

DESCRIPTION: Moderate size, 4.4–6.8, brown, reddish brown, or grayish brown species; dorsum with dark, simple setae and two types of broad, asymmetrical, scalelike setae—silvery white setae broadening distally, with irregular serrate apex and coarse, ir-

regular ridges; black setae broadest medially, narrowing to single acute apex, with regular, evenly spaced, oblique ridges. **Head:** short in lateral view, frons only slightly produced anteriorly of antennal fossae; antennae yellowish brown to fuscous; segment I with pale spots on dorsal aspect, ventral surface mostly pale; segment II usually with pale annulus medially, darkened basal half sometimes with one or two pale spots dorsally; frons weakly and evenly convex, meeting tylus along broad, shallow depression; tylus weakly to moderately produced; eyes obovate, occupying 70–80 percent of head height in lateral view. **Pronotum:** posterior submargin of disk with transverse fuscous line and 4–6 weakly elevated tumid points; propleura pale, narrowly to broadly fuscous dorsally, anterior margin sometimes with dark stripe. **Hemelytra:** grayish white or pale grayish yellow ground color, moderately to extensively darkened with reddish brown to fuscous, except uniformly brownish yellow for *ramosus*; corium with large, pale patch on inner-apical angle; membrane moderately to densely conspurcate, spots usually coalescing to form larger fuscous patches. **Legs:** femora white or pale yellow, with limited to extensive brown or dark brown markings, darkened regions usually interrupted by pale spots; hind femora sometimes with pale, preapical band; tibiae pale with fuscous markings; front and middle tibiae, except in *ramosus*, with three or four dark annuli. **Male genitalia:** genital capsule with well developed tubercles above paramere bases; left tubercle cylindrical, usually distinctly tapered, sometimes with several dark, bristlelike setae on dorsal surface. **Left paramere:** sensory lobe moderately to strongly produced; shaft narrowly expanded distally in dorsal view, usually slightly flattened dorsoventrally; apex narrowly rounded. **Right paramere:** narrowly to broadly lanceolate; apex acute. **Vesica:** primary membranous sac multilobed, lobes usually weakly sclerotized in part, and with patches of coarse tubercles or small spines, sometimes also with smaller accessory lobes, inner-basal margin of left primary lobe with broadly attached, sclerotized plate; right basal lobe well developed, left basal lobe small or indistinct; basal process heavily sclerotized, narrow, extending

slightly above level of gonopore; sclerotized process lance-shaped, flattened, sometimes slightly twisted, or with one or two longitudinal ridges, lateral margins sometimes weakly reflexed, joined to apex of basal process by narrow membranous strap.

DISCUSSION: *Conspurcatus* group species are distributed throughout western North America where they occur on a wide variety of trees and shrubs. One species, *conspurcatus*, also is distributed across southern Canada (Kelton, 1980) and the midwestern and northeastern United States (Knight, 1941). The majority of species appear to be inhabitants of bark, especially those associated with coniferous and deciduous trees. The dark mottled pattern of the hemelytra and legs blends with the color patterns of the bark and associated lichens, making these species nearly invisible when at rest.

At present, there are 11 species included in the *conspurcatus* group, but I have tentatively recognized four additional undescribed taxa in California and Oregon, as well as several unplaced forms from Arizona and New Mexico. I am withholding treatment of these taxa until more specimens are available for study and the host plant associations are better known.

Externally, the species of the *conspurcatus* group are very similar, and it is usually necessary to examine the male genitalia to obtain accurate identifications. The size and position of spinose patches on the lobes of the vesica, and the length of the first antennal segment are particularly useful characters for distinguishing species. The shape of the left genital tubercle and the sclerotized process of the vesica will further differentiate many species of this group.

The structure of the male genitalia indicates a sister-group relationship for the *conspurcatus* and *juniperanus* species-groups. Characters that are unique to the species of these groups are: (1) cylindrical, usually noticeably tapered tubercles above the paramere bases; (2) dorsal margin of left genital tubercle usually with stout, bristlelike setae; and (3) base of sclerotized process of vesica attached to apex of basal process by narrow, membranous strap—without any connection to primary membranous sac of vesica. *Con-*

spurcatus group species are distinguished from *juniperanus* species by the larger average size, longer first antennal segment, and primary membranous sac of vesica with more extensive sclerotization. The *conspurcatus* group also shares a number of derived features with the *aurora*, *fraterculus*, and *tenuis* groups (see discussion sections of these groups for further detail).

KEY TO MALES OF
THE *CONSPURCATUS* GROUP

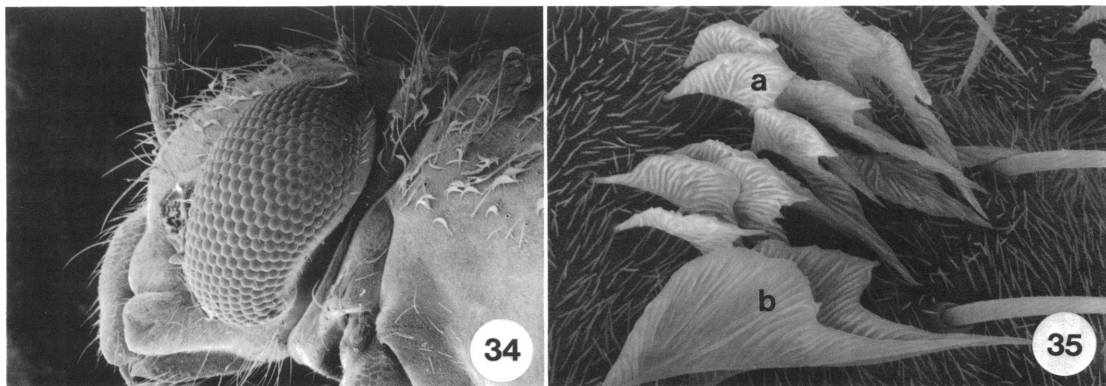
- 1 Genital capsule with two blunt tubercles above base of left paramere (fig. 36a) ..
..... *bituberis* n. sp.
Genital capsule with a single, tapered tubercle above base of left paramere .. 2
- 2(1) Genital capsule with several long, dark, bristlelike setae on and above base of left tubercle (figs. 37a, 45a); left basal lobe of vesica with spinose patch apically ... 3
Genital capsule without dark, bristlelike setae above base of left tubercle, sometimes with finer, pale setae; left basal lobe of vesica without spines apically 4
- 3(2) Ratio of length of antennal segment I to width of head across eyes 0.90:1 to 1.10:1; extreme right lobe of vesica undivided, outer surface of lobe lightly sclerotized *relativus* Knight
Ratio of length of antennal segment I to width of head across eyes 1.15:1 to 1.40:1; extreme right lobe of vesica deeply divided, outer surface of lobe membranous *californicus* Knight
- 4(2) Ratio of length of antennal segment I to width of head across eyes less than 1.10:1 5
Ratio of length of antennal segment I to width of head across eyes equal to or greater than 1.10:1 6
- 5(4) Brownish yellow general coloration; ratio of length of antennal segment I to width of head across eyes 0.65:1 to 0.85:1; front tibiae without dark annuli
..... *ramosus* Uhler
Grayish brown general coloration; ratio of length of antennal segment I to width of head across eyes 0.90:1 to 1.05:1; front tibiae with three dark annuli
..... *juliae* n. sp.
- 6(4) Extreme left lobe of vesica with patch of small spines; genital capsule with small knoblike or ridgelike protuberance anterioriad of base of left tubercle 7
Extreme left lobe of vesica without spines; genital capsule without protuberance an-

- teriad of base of left tubercle
..... *empirensis* Knight
- 7(6) Extreme right lobe of vesica with small spinose patch apically *calli* Knight
Extreme right lobe of vesica without spines apically 8
- 8(7) Ratio of length of antennal segment I to width of head across eyes 1.10:1 to 1.25:1; extreme right lobe of vesica short, not reaching beyond apex at right medial lobe 9
Ratio of length of antennal segment I to width of head across eyes 1.25:1 to 1.40:1; extreme right lobe of vesica elongate, reaching well beyond apex of right medial lobe 10
- 9(8) Cuneus with red or reddish brown markings; sclerotized process of vesica short and broad, apex narrowly produced (fig. 43e) *ketinelbi* Bliven
Cuneus with brown or dark brown markings; sclerotized process elongate, strongly twisted basally (fig. 40e)
..... *conspurcatus* Knight
- 10(8) Hemelytra, especially cuneus, distinctly marked or tinged with red; male genitalia as in figure 39 *calvus* Van D.
Hemelytra without or with only limited red markings; male genitalia as in figure 46
..... *utahensis* Knight

Phytocoris bituberis, new species
Figure 36

HOLOTYPE MALE: Terminus Res. Camp, 5 mi W of Three Rivers, Tulare Co., California, 16 June 1971, M. H. Sweet (SHF; donated to the AMNH).

PARATYPES: CALIFORNIA. **Butte Co.:** Orville: 1 male, 3 September 1975, taken at light, T. R. Haig (CAF&A); 3 males, 13–15 July 1926 and 24 June 1927, H. H. Keifer (CAS). **Calaveras Co.:** 4 males, 1 female, 4.8 km S West Point, 26 July–16 August 1980, S. C. Williams (CAS). **Sacramento Co.:** 4 males, Fair Oaks, 12 August 1933, A. Bellue (CAF&A). **San Bernardino Co.:** 1 male, Mill Crk. Cyn., 24 September 1923, taken on “Oak,” E. P. Van Duzee (CAS). **Santa Barbara Co.:** 1 male, 6 mi SW New Cuyama, 9 July 1965, M. R. Gardner (UCD). **Santa Clara Co.:** 2 males, Alma, 30 August 1933, H. H. Keifer (CAS); 2 males (7 June 1933) and 12 males, 1-female (1 August 1933), Los Gatos, J. A. Kusche (CAS). **Shasta Co.:** 1 male, Castle Craigs St. Pk., August–September 1975, taken at light, R. McGaugh (AMNH). Sis-



Figs. 34, 35. *Conspurcatus* group species. 34. *conspurcatus*, lateral view of head. 35. *relativus*, dorsal vestiture: a, white scalelike setae; b, black scalelike setae.

kiiyou Co.: 1 male, Mt. Shasta City, 13 August 1958, taken at light, J. Powell (UCB). **Stanislaus Co.:** 1 male, La Grange, 31 May 1970, taken at light, R. P. Allen (OSU). **Tulare Co.:** 2 males, same data as holotype (SHF).

DIAGNOSIS: Distinguished from other species of the *conspurcatus* group by the paired tubercles on genital capsule above base of left paramere (fig. 36a), and the short first antennal segment, ratio of segment length to width of head across eyes 0.85:1 to 1.05:1 for males.

DESCRIPTION: *Male.* Length 4.64–5.62, width 1.67–1.98; brown or dark brown general coloration. **Head:** width across eyes 0.92–1.02, vertex 0.29–0.32; pale yellow; base and middle of tylus, jugum, lorum, and buccula marked with red or reddish brown; frons weakly convex, with 6–8 red to fuscous striae. **Rostrum:** length 2.03–2.34, reaching sixth or seventh abdominal segment. **Antennae:** brown or dark brown, segment I sometimes reddish brown; I, length 0.79–1.03, with pale spots on dorsal aspect, ventral surface mostly pale; II, length 1.76–2.12, with distinct pale annulus medially; III, length 1.04–1.31, with weakly defined pale annulus medially; IV, length 0.70–0.76. **Pronotum:** mesal length 0.76–0.88, posterior width 1.39–1.58; disk pale grayish yellow, tinged with brown to fuscous especially behind calli and along lateral margins; posterior submargin of disk with wavy fuscous line and 4–6 weakly elevated points, extreme posterior margin pale; calli moderately to extensively marked with reddish brown or dark brown; propleura fuscous basally, apical half pale. **Scutellum:** pale yellow with reddish brown to fuscous markings,

usually with dark spot on apex and either side before apex. **Hemelytra:** grayish yellow, lightly to extensively darkened with brown or dark brown especially on clavus, along inner margin of corium, and on cuneus; borders of claval commissure and patch at apex of corium pale; membrane densely conspurcate. **Legs:** femora white or pale yellow with reddish brown to fuscous markings mostly on apical half; hind femora extensively darkened and marked with pale spots; tibiae pale with three or four fuscous annuli, bands on hind tibiae less distinct. **Vestiture:** as noted in group description. **Genitalia:** Figure 36. Genital capsule with two large tubercles above base of left paramere (fig. 36a).

Female. Similar to male in color, vestiture, and structure. Length 5.13, width 1.80. **Head:** width across eyes 0.92, vertex 0.39. **Rostrum:** length 2.34, reaching well beyond apices of hind coxae. **Antennae:** I, 0.99; II, 2.07; III, 1.24; IV, 0.74. **Pronotum:** mesal length 0.79, posterior width 1.48. The female measurements were taken from a single specimen collected in Corvallis, Benton Co., Oregon.

ETYMOLOGY: From the Latin, *bi* (two) and *tuberis* (swelling), referring to the paired genital tubercles of the male.

DISCUSSION: *Phytocoris bituberis* has been collected in California from Mill Crk. Cyn., San Bernardino County north through the interior valley to Mt. Shasta City, Siskiyou County. Several specimens also were taken in Benton Co., Oregon. Adults have been collected on *Quercus garryana* Dougl. and an undesigned species of oak in Mill Crk. Cyn.

ADDITIONAL SPECIMENS: Five specimens

were collected on *Quercus garryana* in Corvallis, Benton Co., Oregon, 26 July–9 August.

Phytocoris californicus Knight

Figure 37

Phytocoris californicus Knight, 1968: 244, 245, fig. 303.

TYPES: Described from a single male taken at Santa Ana, Orange Co., California, 1 March 1935, ex. *Salvia mellifera* Greene., E. L. Pad-dock. The holotype is retained in the Knight Collection (USNM).

DIAGNOSIS: Length 4.8–6.8. Distinguished from other species of the *conspurcatus* group by the following combination of characters: genital capsule of the male with long, dark, bristlelike setae near base of left genital tubercle (fig. 37a); ratio of length of antennal segment I to width of head across eyes 1.15:1 to 1.40:1 for males; left basal lobe of vesica with small spinose patch apically; and extreme right lobe of vesica deeply divided. *Phytocoris californicus* is very similar to *relativus* but differs by the longer first antennal segment and divided right lobe of the vesica.

DISCUSSION: *Phytocoris californicus* is widely distributed in California, but is uncommon in the arid southeastern portion of the state. The distribution extends into Oregon on the west side of the Cascade Range as far north as Marion County. Specimens also have been collected in Walla Walla Co., Washington and Lemhi Co., Idaho. *Phytocoris californicus* inhabits a variety of shrubby plants but is most frequently taken on *Ceanothus* (e.g., *C. cordulatus* Kell., *C. cras-sifolius* Torr., *C. integerrimus* M.&H., *C. velutinus* Dougl.). Other host plant records are *Beloperone californica* Benth., *Eriogonum latifolium* Sm., *Hazardia squarrosus* H.&A., *Rhamnus crocea* Nutt., *Salvia apiana* Jeps., and *S. mellifera* Greene. Both sexes are attracted to light. I have examined 375 specimens with collection dates from January 13 to December 17.

Phytocoris calli Knight

Figures 1, 4, 38

Phytocoris calli Knight, 1934: 11, 12. – Carvalho, 1959: 193. – Knight, 1968: 240, fig. 292.

Phytocoris laticeps Knight, 1968: 243, fig. 300.
NEW SYNONYMY.

TYPES: *Phytocoris calli* was described from a single male collected on Mt. Timpanogos, nr. Aspen Grove, Utah Co., Utah. This specimen is deposited in the Knight Collection (USNM).

The junior synonym, *laticeps*, was described from a single specimen taken at light in Richfield, Sevier Co., Utah, 15 August 1929. The male holotype is retained in the Knight Collection (USNM).

DIAGNOSIS: Length 5.8–6.5. Distinguished from other species of the *conspurcatus* group by the following combination of characters: ratio of length of antennal segment I to width of head across eyes 1.10:1 to 1.30:1 for males; base of left genital tubercle without bristlelike setae; extreme right lobe of vesica with small spinose patch apically; left basal lobe of vesica without spines. *Phytocoris calli* shares the above characters with *empirensis* but differs by the small patch of spines on the extreme left lobe of the vesica, the small ridgelike protuberance on the genital capsule above the left tubercle, and the shape of the left genital tubercle (fig. 38a), right paramere (fig. 38d), and sclerotized process of vesica (fig. 38e).

DISCUSSION: Although *calli* is not well collected, the available records suggest that this species is broadly distributed in the northwestern United States. Specimens have been collected in the Coast and Cascade Ranges of Oregon, east to central and southern Idaho, and south on the Wasatch Plateau of central Utah to Sevier County. A single specimen each also was examined from Johnsville, Plumas Co., California and Elwha Cmp., Olympic Nat. Pk., Washington. The majority of specimens were collected from *Abies concolor* (Gord. & Glend.) Lindl. and *A. grandis* (Dougl.) Lindl., but several examples in Oregon were taken on *Larix occidentalis* Nutt., *Pinus contorta* Dougl., and *Pseudotsuga menziesii* (Mirb.) Franco. I have examined 22 specimens with collection dates from July 14 to September 29.

Upon examination of external and genitalic characters, the male holotype of *laticeps* was found to be conspecific with *calli* and is here placed in synonymy with the latter species.

Phytocoris calvus Van Duzee

Figure 39

Phytocoris calvus Van Duzee, 1920: 343, 344. – Carvalho, 1959: 193. – Knight, 1968: 240, fig. 289.

TYPES: Described from a single specimen taken on Mt. Wilson, San Gabriel Mts., Los Angeles Co., California, 10 August 1909, F. Grinnell, Jr. The male holotype (no. 2003) is deposited in the Van Duzee Collection (CAS).

DIAGNOSIS: Length 5.6–6.4. Recognized by the reddish cuneus; long first antennal segment, ratio of segment length to width of head across eyes 1.25:1 to 1.40:1 for males; long, narrow left genital tubercle (fig. 39a); and elongate extreme right lobe of the vesica, without apical spines. *Phytocoris calvus* is most similar to *californicus* but differs by the absence of dark, bristlelike setae near the base of the left genital tubercle and the left basal lobe of the vesica without apical spines.

DISCUSSION: The distribution of *calvus* seems to be restricted to the chaparral zone of southwestern California. Specimens have been taken from Lompoc, Santa Barbara County, south to Alpine, San Diego County. Adults have been collected on *Ceanothus integerrimus* H.&A. and *Ceanothus leucodermis* Greene. I have examined 21 specimens with collection dates from June 26 to August 9.

Phytocoris conspurcatus Knight

Figures 34, 40

Phytocoris conspurcatus Knight, 1920: 61, 62, pl. I, fig. 16; 1923: 626, fig. 149. – Blatchley, 1926: 705, pl. XI, fig. 16. – Knight, 1941: 188, 189, figs. 174, 175. – Froeschner, 1949: 183. – Carvalho, 1959: 195. – Knight, 1968: 240, fig. 290. – Kelton, 1980: 178, 179, fig. 128, map 54.

TYPES: Described from 28 specimens collected in Connecticut, Massachusetts, Michigan, Minnesota, New York, Ohio, Washington, D.C., and Ontario, Canada. The male holotype, allotype, and four female paratypes were taken at Batavia, Genesee Co., New York, 17 August 1916, H. H. Knight. One male bearing a Knight paratype label, and with the following label data was omitted from the original description: Batavia, NY, 31 July 1916, H. H. Knight, on hickory bark. The

holotype, allotype, and six paratypes are retained in the Knight Collection (USNM). The remaining 20 paratypes were not located.

DIAGNOSIS: Length 5.6–6.8. The following combination of characters will separate this species from other members of the *conspurcatus* group: ratio of length of antennal segment I to width of head across eyes 1.10:1 to 1.25:1 for males; genital capsule without dark, bristlelike setae near base of left tubercle; left basal lobe and extreme right lobe of vesica without apical spines, right lobe not reaching beyond apex of right medial lobe.

DISCUSSION: *Phytocoris conspurcatus* is widely distributed in the midwestern and northeastern United States, and across southern Canada where it occurs on bark of deciduous trees (e.g., *Acer*, *Pyrus*, *Salix*, *Tilia*). It has been reported as far west as Colorado, Kansas, South Dakota, and North Dakota (Knight, 1968), but also occurs west of the Rocky Mts. in Colorado, Wyoming, Montana, Idaho, Washington, Oregon, and British Columbia. Specimens have been collected from the following host plants in western North America: *Alnus rubra* Bong., *Pinus ponderosa* Dougl., *Pseudotsuga menziesii* (Mirb.) Franco., *Pyrus* sp., *Salix* spp., and *Tilia platyphylla* Scop. I have examined 36 western specimens with collection dates from July 11 to September 25.

In western North America, *conspurcatus* is most easily confused with *calli*, which has a similar distribution in the northwestern United States. It is distinguished from *calli* by the narrower, more elongate left genital tubercle and by the absence of apical spines on the extreme right lobe of the vesica. Also, *conspurcatus* usually has a pale, median annulus on antennal segment III, and a pale line dividing the dark basal region of the propleuron. These markings are absent or poorly defined in *calli*.

Phytocoris empirensis Knight

Figure 41

Phytocoris empirensis Knight, 1968: 246, fig. 293. *Phytocoris rinconae* Knight, 1968: 246, 247, fig. 295. NEW SYNONYMY.

TYPES: *Phytocoris empirensis* was described from two specimens taken in the Em-

pire Mts., Pima Co., Arizona, 1525 m, 20 May 1928, A. A. Nichol. The male holotype and allotype are retained in the Knight Collection (USNM).

The junior synonym, *rinconae*, was described from a single male collected in the Rincon Mts., Pima Co., Arizona, 1006 m, 27 May 1928, A. A. Nichol. This specimen is deposited in the Knight Collection (USNM).

DIAGNOSIS: Length 5.0–6.6. Distinguished from other species of the *conspurcatus* group by the following combination of characters: ratio of length of antennal segment I to width of head across eyes 1.10:1 to 1.40:1 for males; genital capsule of male without dark, bristle-like setae near base of left tubercle; extreme left lobe and left basal lobe of vesica without spinose patches.

DISCUSSION: *Phytocoris empirensis* is widely distributed in Utah and Arizona but does not occur in the Bonneville Saltbush section of western Utah or the Sonoran Desert region of southwestern Arizona. Its host plant association is not known; several males have been taken at light. I have examined 42 specimens with collection dates from May 2 to September 22.

Phytocoris rinconae is placed in synonymy with *empirensis* on the basis of the nearly identical genitalia of the male holotypes. The characters used by Knight (1968: 237) to separate *rinconae* and *empirensis* are subject to considerable variation and do not represent species specific differences.

Phytocoris juliae, new species

Figure 42

HOLOTYPE MALE: Lehman Crk. Cmpgd., Humboldt Nat. For., White Pine Co., Nevada, 2286 m, 12 August 1980, ex. *Abies concolor* (Gord. & Glend.) Lindl., G. M. and J. A. Stonedahl (AMNH).

PARATYPES: COLORADO. **Arapahoe Co.:** 1 male, Englewood, 8 August 1983, J. T. and D. A. Polhemus (JTP). **Boulder Co.:** 2 males, 1 female, 6 mi W Boulder, 8–12 August 1973, J. C. Schaffner (SHF). **Jefferson Co.:** Deer Crk. Cyn.: 4 males, 3 females, 10 July 1979; 4 males, 4 females, 15 July 1980; 1 male, 7 August 1981, ex. *Pseudotsuga menziesii* (Mirb.) Franco.; 1 female, 21 September 1982, ex. *Pseudotsuga menziesii*; all J. T. Polhemus

(JTP). NEVADA. **White Pine Co.:** 2 males, 14 females, same data as holotype (AMNH, CAS, OSU, USNM); 6 males, 3 females, Wheeler Pk. Drive, 2134–3048 m, 6 August 1982, ex. *Abies concolor*, M. D. Schwartz (AMNH). UTAH. **Cache Co.:** Green Cyn. Trail, 5 mi NE Logan, 1830–1980 m, 18 July 1981, ex. *Pseudotsuga menziesii*, M. D. Schwartz (AMNH). **Duchesne Co.:** 3 males, 6 females, Left Fork Indian Cyn. Smt. on St. Hwy. 33, 2775 m, 9 August 1981, ex. *Pseudotsuga menziesii*, M. D. Schwartz (AMNH). **Wasatch Co.:** 1 male, Dock Flat, 1 mi NE St. Hwy. 40, T2S R12W Sec. 9, 2438 m, 14 August 1982, ex. *Abies lasiocarpa* (Hook.) Nutt., M. D. Schwartz (AMNH).

DIAGNOSIS: Distinguished from other species of the *conspurcatus* group by the following combination of characters: ratio of length of antennal segment I to width of head across eyes 0.90:1 to 1.05:1 for males; base of left genital tubercle without long, dark, bristlelike setae; and left basal lobe of vesica without spines distally. *Phytocoris juliae* keys to the couplet with *ramosus* but is easily differentiated from this species by the longer first antennal segment, grayish brown general coloration, and distinct dark annuli on the front tibiae.

DESCRIPTION: *Male.* Length 5.02–6.00, width 1.71–2.09; grayish brown general coloration; corium, especially distally, and cuneus sometimes tinged with red. **Head:** width across eyes 0.92–0.99, vertex 0.32–0.35; pale yellow; buccula, jugum, lorum, and tylus marked with reddish brown or fuscous; frons weakly convex, with five or six weakly defined, reddish striae. **Rostrum:** length 2.48–2.79, reaching seventh or eighth abdominal segment. **Antennae:** I, length 0.85–0.97, grayish white with reddish brown to fuscous markings on dorsal aspect; II, length 2.00–2.38, yellowish brown, sometimes slightly paler medially; III, length 1.26–1.42, brown or dark brown; IV, length 0.86–1.01, brown or dark brown. **Pronotum:** mesal length 0.76–0.90, posterior width 1.37–1.57; disk pale yellow or grayish yellow, sometimes tinged with brown; posterior submargin of disk with transverse fuscous line and 4–6 weakly elevated points, extreme posterior margin narrowly pale; calli lightly to moderately marked with red or reddish brown; basal half of pro-

pleura fuscous, sometimes with pale stripe anteriorly, apical half pale. **Scutellum:** grayish white or pale grayish yellow with reddish brown to fuscous markings; dark spot on apex and usually with dark spot either side before apex. **Hemelytra:** grayish white, moderately to extensively marked with brown or fuscous; apex and middle of corium with distinct pale area; cuneus pale, sometimes tinged with red, apical third to one-half marked with fuscous; membrane densely conspurcate. **Legs:** femora white or pale yellow with reddish brown or fuscous markings mostly on apical half; dark markings on hind femora broken by pale spots, spots coalescing preapically to form transverse pale band; tibiae pale with three or four fuscous annuli; hind tibiae usually with only two dark annuli. **Vestiture:** as noted in group description. **Genitalia:** Figure 42.

Female. Similar to male in color, vestiture, and structure. Length 5.13–5.94, width 1.84–2.16. **Head:** width across eyes 0.93–1.00, vertex 0.36–0.40. **Rostrum:** 2.63–2.88, reaching base of ovipositor or slightly beyond. **Antennae:** I, 0.94–1.03; II, 2.25–2.48; III, 1.26–1.54; IV, 0.90–1.13. **Pronotum:** mesal length 0.77–0.92, posterior width 1.38–1.67.

ETYMOLOGY: Named for my wife Julie Anne, who assisted in collecting this species at the type locality in Nevada.

DISCUSSION: This species is widely distributed in coastal mountain ranges and the Cascade Range from Napa Co., California to Riske Creek, British Columbia. Specimens also have been collected in the Snake Mt. Range of eastern Nevada, the Wasatch Plateau of north central Utah, and the Rocky Mts. in northern Colorado; a single specimen was seen from Bozeman, Gallatin Co., Montana. Western populations differ slightly from those in Colorado, Nevada, and Utah by the following characteristics: corium, especially distally, and cuneus often tinged with red; genital capsule with slightly longer, less distinctly tapered genital tubercles, and with more prominent knoblike protuberance anteriorly of primary tubercles (fig. 42b); right paramere more noticeably narrowed distally (fig. 42f); and sclerotized process of vesica nearly uniform in width (fig. 42h), not expanded on left lateral margin as in specimens from eastern populations (fig. 42g).

Phytocoris juliae has been collected on *Abies*

concolor (Gord. & Glend.) Lindl., *A. lasiocarpa* (Hook.) Nutt., and *Pseudotsuga menziesii* (Mirb.) Franco.

ADDITIONAL SPECIMENS: 64 specimens were examined from the following localities: **BRITISH COLUMBIA:** Carquille rest area (UBC); Spanish Hills, Galiano Is. (UBC); Galiano Is. (northend) (UBC). **CALIFORNIA.** **Napa Co.:** N side Howell Mt., 2 mi NNE Angwin, 400 m (CAS). **Shasta Co.:** Castle Craigs St. Pk. (AMNH). **COLORADO.** **Douglas Co.:** Chatfield St. Pk. (JTP); Sedalia (JTP). **MONTANA.** **Gallatin Co.:** Bozeman (MSU). **OREGON.** **Benton Co.:** Corvallis (AMNH, OSU); Winkle Lk., 10 mi S Corvallis (OSU); Marys Peak Rd., 610 m (AMNH). **Klamath Co.:** Klamath Falls (AMNH). **Lane Co.:** H. J. Andrews Expt. Forest (OSU). **Marion Co.:** Salem (OSU). **UTAH.** **Box Elder Co.:** Snowville (USU). **Cache Co.:** Logan (USU). **Juab Co.:** Mt. Nebo (USU). **Utah Co.:** Provo (USU). Collection dates are from July 7 to October 20.

Phytocoris ketinelbi Bliven

Figure 43

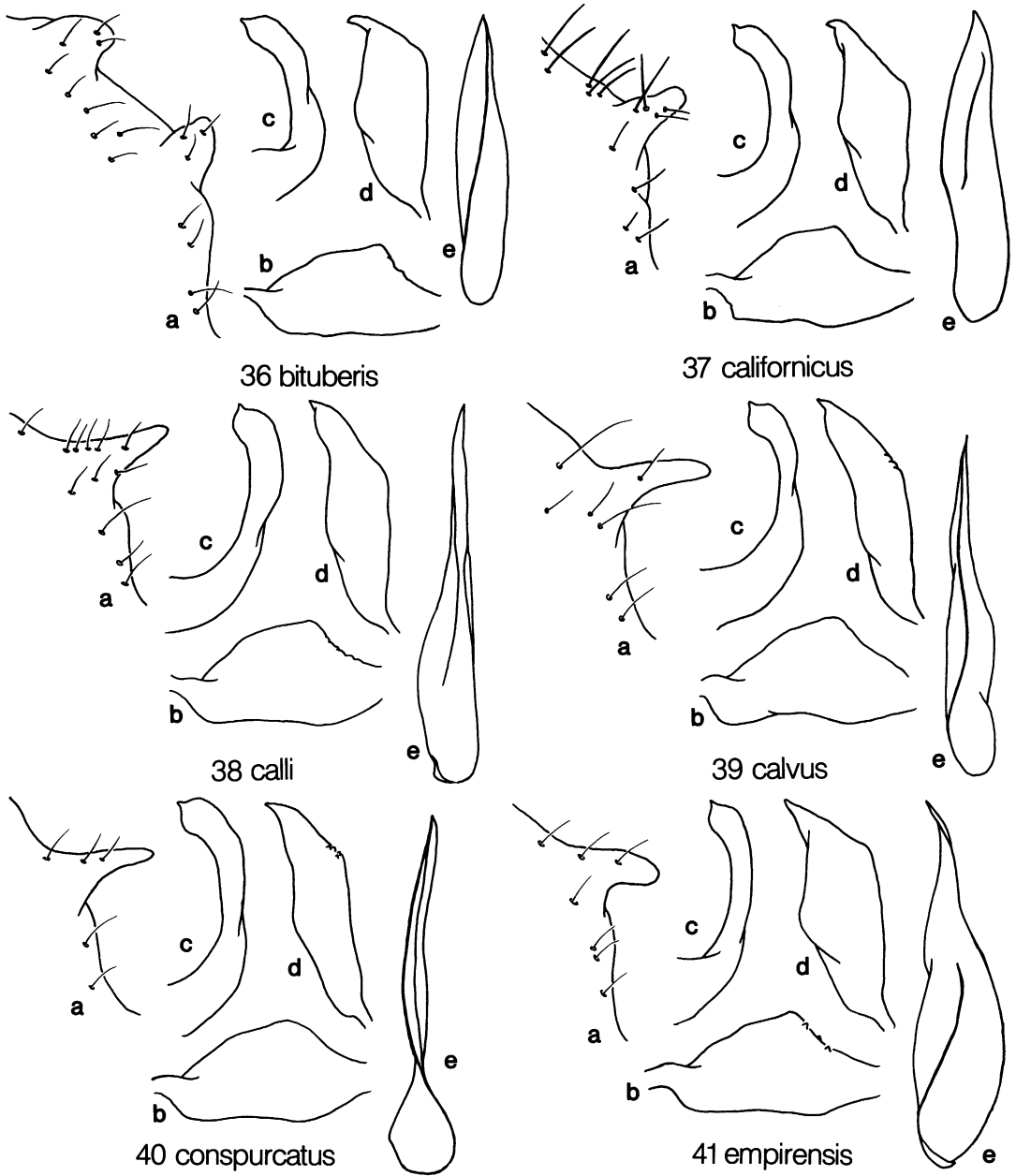
Phytocoris ketinelbi Bliven, 1966: 118, pl. X, figs. 12, 13.

Phytocoris kahtahbi Bliven, 1966: 117, 118, pl. X, figs. 10, 11. **NEW SYNONYMY.**

TYPES: *Phytocoris ketinelbi* was described from 31 specimens collected in Humboldt and Trinity counties, California. The male holotype (no. 13876) was taken at Kneeland, Humboldt Co., 12 September 1937, B. P. Bliven. All type material is retained in the collection of the CAS. In the original description, Bliven (1966) states that many of the specimens from the type series were taken on willow.

The junior synonym, *kahtahbi*, was described from a male holotype and allotype collected at Weymouth, Humboldt Co., California, 5 September 1954, ex *Baccharis* sp., B. P. Bliven. Both specimens are deposited in the CAS collection (type number 13875).

DIAGNOSIS: Length 5.1–6.3. The following combination of characters will distinguish *ketinelbi* from other species of the *conspurcatus* group: cuneus distinctly marked or tinged with red or reddish brown; ratio of length of antennal segment I to width of head

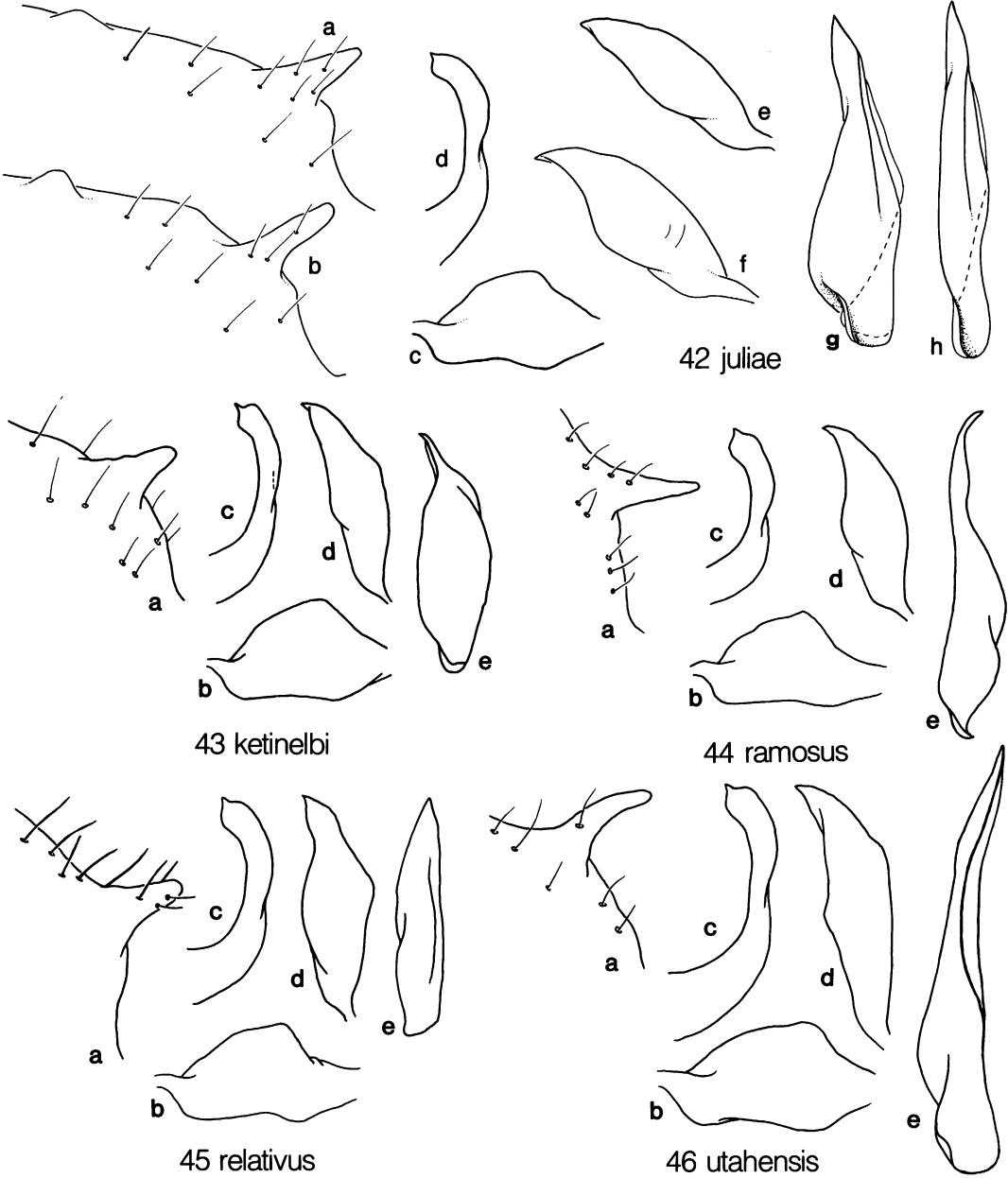


Figs. 36–41. Male genitalia of *conspurcatus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

across eyes 1.10:1 to 1.25:1; base of left genital tubercle without dark, bristlelike setae; extreme left lobe of the vesica with patch of small spines; left basal lobe of vesica without apical spines; extreme right lobe of the vesica

small, not reaching beyond apex of right medial lobe, without patch of small spines apically; sclerotized process of vesica short, broad, apex narrowly produced (fig. 43e).

DISCUSSION: This species occurs at low to



Figs. 42–46. Male genitalia of *conspurcatus* group species. 42. a, b. Left dorsolateral margin of genital capsule. a. eastern population. b. western population. c. Arm of left clasper (eastern population), lateral view. d. Shaft of left clasper (eastern population), lateral view. e, f. Right clasper, lateral view. e. eastern population. f. western population. g, h. sclerotized process of vesica. g. eastern population. h. western population. 43–46. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

moderate elevations in coastal mountain ranges from Benton Co., Oregon to San Diego

Co., California. Adults have been collected from *Arctostaphylos tomentosa* (Pursh) Lindl.,

Baccharis sp., *Lithocarpus densiflora* (H.&A.) Rehd., *Myrica californica* Cham. & Schlecht, *Salix* sp., and *Tilia platyphylla* Scop. Males are attracted to light. I have examined 64 specimens with collection dates from July 5 to November 3.

Phytocoris ramosus Uhler

Figure 44

Phytocoris ramosus Uhler, 1894: 252, 253. – Van Duzee, 1917a: 319. – Carvalho, 1959: 214. – Knight, 1968: 216. – Henry and Stonedahl, 1983: 458, 459.

Phytocoris covilleae Knight, 1925a: 54, 55. – Carvalho, 1959: 214 (syn.).

TYPES: In the original description of *ramosus*, Uhler refers to specimens collected at Cape St. Lucas, Mexico; San Bernardino and Los Angeles, California; and Flagstaff, Arizona. Unfortunately, Uhler did not designate a type specimen or indicate how many specimens were present in the type series. I have examined three female specimens in the CAS collection that appear to be from the original syntype series with label data: 1, "S(an) Berna(r)dino Co., Cal."; 2, "Uhler type". One specimen bears a red lectotype label and the others are tagged with orange paratype labels. The colored type labels were probably added by E. P. Van Duzee, but a type designation was never published for this species. The specimen with the lectotype label was designated as such by Henry and Stonedahl (1983). The lectotype (no. 555) and both paralectotypes are retained in the CAS collection.

The junior synonym, *covilleae*, was described from seven specimens collected on *Larrea divaricata* Cav., at Tucson, Pima Co., Arizona, 19 April 1924, A. A. Nichol. The male holotype and three paratypes are retained in the Knight Collection (USNM), one paratype each is deposited in the collections of the CAS and UAZ, and one paratype was not located.

DIAGNOSIS: Length 4.5–6.2. Recognized by the short first antennal segment, ratio of segment length to width of head across eyes 0.65: 1 to 0.85:1 for males; uniformly pale yellow or brownish yellow hemelytra, sometimes lightly tinged with red; and by the absence of dark annuli on the front tibiae.

DISCUSSION: *Phytocoris ramosus* is distributed throughout the Mojave and Sonoran deserts, the Mexican Highland Province of southeastern Arizona, and the Chihuahuan Desert Province of southern New Mexico and western Texas. This species breeds on *Larrea divaricata* Cav. and is often encountered in great abundance. Males and females are attracted to light. I have examined 676 specimens with collection dates from February 16 to December 17.

Phytocoris relativus Knight

Figures 35, 45

Phytocoris relativus Knight, 1968: 240, 241, fig. 299.

Phytocoris albiscutellatus Knight, 1968: 242, 243, fig. 301. **NEW SYNONYMY.**

TYPES: *Phytocoris relativus* was described from nine specimens collected in Arizona and Utah. The male holotype was taken near the end of Bright Angel Trail, Grand Cyn. Nat. Pk., 2 August 1917, H. H. Knight. All type material is retained in the Knight Collection (USNM) except one male paratype from Richfield, Sevier Co., Utah, that was not located. Upon examination, the allotype female, also from Richfield, Utah, was found to be conspecific with *empirensis*. It is possible that the misplaced male paratype from Richfield also is conspecific with *empirensis*.

The junior synonym, *albiscutellatus*, was described from three specimens (male holotype, allotype, and female paratype) taken in the Chiricahua Mts., Cochise Co., Arizona, 1890 m, 20 June 1928, A. A. Nichol and one female paratype collected in Area 19M, Nevada Test Site, Nye Co., Nevada, 22 June 1965, ex. *Artemisia tridentata* Nutt., H. H. Knight and J. M. Merino. All type material is retained in the Knight Collection (USNM) except the specimen from Nevada which was not located.

DIAGNOSIS: Length 4.4–6.5. *Phytocoris relativus* is very similar to *californicus* but differs by the shorter first antennal segment, ratio of segment length to width of head across eyes 0.90:1 to 1.10:1, and by the undivided extreme right lobe of the vesica. It is distinguished from other members of the *conspurcatus* group by the long, bristlelike setae on

the genital capsule above the base of the left tubercle (fig. 45a), and the small spinose patch on the apex of the left basal lobe of the vesica.

DISCUSSION: *Phytocoris relativus* is widely distributed in the western United States from the San Jacinto Mts. in California, north along both slopes of the Sierra Nevada Mts. and east of the Cascade Range in Oregon to Deschutes and Baker counties. It also occurs across southern Idaho and throughout much of Nevada, Utah, Arizona, and western Colorado. Specimens also were seen from Tijeras, Bernalillo Co., New Mexico. The primary host plants are *Cercocarpus ledifolius* Nutt. and *C. betuloides* Nutt., but specimens also have been collected on *Artemisia tridentata* Nutt., *Cowania mexicana* var. *stansburiana* (Torr.) Jeps., *Crataegus douglasii* Lindl., *Purshia tridentata* (Pursh.) DC., *Ribes cereum* Dougl., *Simmondsia* sp., and *Sorbus scopulina* Greene. A large series of this species also was collected on *Phoradendron californicum* Nutt. in Maricopa Co., Arizona. I have examined 258 specimens with collection dates from February 14 to October 17. Males and females are attracted to light.

Phytocoris albiscutellatus is placed in synonymy with *relativus* on the basis of the nearly identical male genitalia and indistinguishable external morphology of the holotypes. The extent of the fuscous markings on the scutellum, used by Knight (1968: 237) to sep-

arate *albiscutellatus* and *relativus*, is subject to considerable variation.

Phytocoris utahensis Knight

Figure 46

Phytocoris utahensis Knight, 1961: 473, 474, fig. 2; 1968: 240, fig. 291.

TYPES: Described from four specimens taken at light in Richfield, Sevier Co., Utah, 15 July and 15 August 1929, 8 July 1930. The male holotype, allotype, and one male paratype are retained in the Knight Collection (USNM); one male paratype was not located.

DIAGNOSIS: Length 6.1–6.6. Distinguished from other members of the *conspurcatus* group by the following combination of characters: ratio of length of antennal segment I to width of head across eyes 1.25:1 to 1.40:1 for males; genital capsule without dark, bristlelike setae near base of left tubercle; left basal lobe and extreme right lobe of vesica with small spines apically. *Phytocoris utahensis* keys to the couplet with *calvus* but lacks the reddish tinge on the hemelytra that is distinctive of the latter species.

DISCUSSION: *Phytocoris utahensis* is known only from the type material collected at Richfield, Sevier Co., Utah, and a single male taken at Logan, Cache Co., Utah, 12 August 1942 (USNM). The host plant association is not known.

CUNEALIS SPECIES-GROUP

DIAGNOSIS: Recognized by the large size; yellow or brownish yellow general coloration with distinctive red to dark brownish red markings; subquadrate head with prominent, apically deflexed frons (fig. 47); antennal segment I usually with densely distributed, erect, pale, bristlelike setae; and vesica of male genitalia with greatly reduced primary membranous sac and three or four large sclerotized processes (fig. 5).

DESCRIPTION: Large, 6.5–8.6, pale species with red to dark brownish red markings; vestiture of dorsum with golden to dark brown, simple setae and silvery white to golden brown, sericeous setae. **Head:** subquadrate with prominent frons and tylus; frons strongly deflexed apically, meeting tylus along broad

depression; antennae pale yellow or brownish yellow; length of segment I equal to or greater than posterior width of pronotum, segment I usually with densely distributed, erect, pale, bristlelike setae; eyes small, length in lateral view equal to or slightly greater than width of vertex—ratio rarely exceeding 1.20:1. **Pronotum:** disk lightly to extensively shaded with red or brownish red, posterior submargin sometimes with fuscous band or series of dark patches; propleura tinged or marked with red or brownish red, apical third uniformly pale. **Hemelytra:** pale yellow or brownish yellow with reddish orange to brownish red markings, sometimes also lightly tinged with brown; corium usually with large, oblique, reddish mark medially; distal third to one-

half of cuneus extensively reddened; membrane conspurcate. **Legs:** femora pale yellow; hind femora moderately to extensively marked with red or brownish red, sometimes with reticulate pattern, darkened regions usually interrupted by pale spots; tibiae pale yellow, sometimes with red band at base. **Male genitalia:** genital capsule large, subquadrate, with prominent, usually broadly produced, tubercles above paramere bases, except genital tubercles less prominent in *rubrimaculatus*. *Left paramere:* sensory lobe moderately to strongly produced; shaft swollen basally, narrowly expanded distally in dorsal view, more broadly expanded in *fuscusignatus*, outer margin of expanded region dorsoventrally flattened; apex truncate or narrowly rounded. *Right paramere:* lanceolate or elongate, dorsal surface of arm sometimes with series of small spines; shaft usually strongly incurved just before apex; apex acute. *Vesica:* primary membranous sac except *rufoscriptus*, greatly reduced; basal lobes variable in size and shape; three or four sclerotized processes, except *rufoscriptus* with single process; variable in size and shape, usually narrowly attached basally to primary membranous sac, left process sometimes more broadly attached along inner margin, middle left process sometimes very small; basal process well sclerotized, extending to level of gonopore or slightly beyond, expanded apically, sometimes continuous with base of right sclerotized process.

DISCUSSION: Members of the *cunealis* group are distributed throughout the Chaparral and Sierran Forest provinces of California, and also occur in the Pacific Forest Province of northwestern California and western Oregon as far north as Benton and Linn counties. With the exception of *hettenshawii*, which is found on *Arctostaphylos*, all *cunealis* group species inhabit plants belonging to the family Fagaceae (i.e., *Castanopsis*, *Lithocarpus*, *Quercus*).

The large size, pale general coloration, dorsal vestiture, and head structure of *cunealis* group species suggest a relationship to members of the *lasiomerus* and *roseipennis* groups. However, the greatly reduced primary membranous sac of the vesica indicates a closer relationship to *rostratus* or possibly *hopi* group species. The multiple sclerotized process of the vesica found in most members of the *cu-*

nealis group is unique for western North American *Phytocoris*.

KEY TO SPECIES OF THE *CUNEALIS* GROUP

- 1 Posterior submargin of pronotal disk with transverse series of fuscous spots set with tufts of black setae; vesica with a single sclerotized process (fig. 53e) *rufoscriptus* Van D.
- Posterior submargin of pronotal disk sometimes darkened, but without distinct fuscous spots; vesica with three or four sclerotized processes 2
- 2(1) Pronotal disk mottled with red or reddish orange, leaving spots and larger patches of white or pale yellow; genital capsule swollen above base of left paramere but without distinct tubercle (fig. 52a) *rubrimaculatus* n. sp.
- Pronotal disk variously marked with red, brownish red, or brown, but without distinct pale spots; genital capsule with prominent tubercle above base of left paramere 3
- 3(2) Left genital tubercle small, apex acute or narrowly rounded (fig. 50a); vesica with three sclerotized processes (fig. 50e-g); parameres distinctive (fig. 50b-d) *fuscusignatus* Knight
- Left genital tubercle large, apex broadly rounded; vesica with four sclerotized processes, middle left process sometimes very small 4
- 4(3) Right sclerotized process elongate (figs. 49h, 51h), length greater than that of left process 5
- Right sclerotized process shorter (fig. 54h), length less than that of left process *sewardi* Bliven
- 5(4) Middle left sclerotized process very small and narrow (fig. 51f); left genital tubercle as in figure 51a *hettenshawii* Bliven
- Middle left sclerotized process larger, broad at base and tapering distally (fig. 49f); left genital tubercle as in figure 49a *cunealis* Van D.

Phytocoris cunealis Van Duzee

Figure 49

Phytocoris cunealis Van Duzee, 1914: 16, 17; 1917a: 319; 1917b: 62. – Carvalho, 1959: 196. – Knight, 1968: 215, fig. 256. – Henry and Stonedahl, 1983: 449.

TYPES: *Phytocoris cunealis* was described from a series of specimens collected in San

Diego Co., California, 13 April–6 June, 1913 and 1914, by E. P. Van Duzee. Nineteen of these are retained in the Van Duzee Collection (CAS), and one male specimen is deposited in the Knight Collection (USNM). These specimens are identified by “paratype” labels (orange), which Van Duzee apparently added at a later date. Van Duzee also selected a lectotype (no. 2005) and “allotype” (no. 2006) from the syntype series but did not publish an account of these actions. The male specimen selected as a lectotype by Van Duzee is designated as such by Henry and Stonedahl (1983). This specimen is deposited in the CAS collection.

DIAGNOSIS: Length 6.5–7.7. This species is recognized by the following combination of characters: dorsal surface not mottled with red or reddish orange as in *rubrimaculatus* and *rufoscriptus*; left genital tubercle large, broadly rounded (fig. 49a); vesica with four sclerotized processes (fig. 49e–h), right sclerotized process longer than the left, middle left process broad at base and tapering distally. *Phytocoris cunealis* usually has longer bristlelike setae on the legs and first antennal segment than either *sewardi* or *hettenshawii*, but setal length is somewhat variable in all three taxa.

DISCUSSION: *Phytocoris cunealis* is distributed in the chaparral zone of southwestern California. I have examined 104 specimens from Los Angeles, Riverside, San Bernardino, and San Diego counties. Collection dates are from April 12 to July 28. The majority of specimens with host plant data were collected from *Quercus dumosa* Nutt. Several specimens also were taken on *Quercus agrifolia* Nee.

Phytocoris fuscognatus Knight

Figure 50

Phytocoris fuscognatus Knight, 1928: 45, 46. – Carvalho, 1959: 200. – Knight, 1968: 216, fig. 258.

TYPES: The original description of this species is based on a single female collected at Corvallis, Benton Co., Oregon, 26 June 1926, C. J. Drake. This specimen is retained in the Knight Collection (USNM).

DIAGNOSIS: Length 6.8–8.6. *Phytocoris fuscognatus* is distinguished from other species

of the *cunealis* group by the following combination of characters: dorsal surface not mottled with red or reddish orange as in *rubrimaculatus* and *rufoscriptus*; left genital tubercle small with acute or narrowly rounded apex (fig. 50a); and vesica with three sclerotized processes (fig. 50e–g).

DISCUSSION: This species occurs at low to moderate elevations, 300–1500 m, in coastal mountain ranges from Benton and Marion counties, Oregon to Napa Co., California; in the Siskiyou Mts. of southeastern Oregon and transverse mountain ranges of northern California; and along the western slopes of the Cascade Range and Sierra Nevada Mts. in California. The southernmost records are from the Tehachapi Mts., Kern Co. and the San Gabriel Mts., Los Angeles County. Several specimens also were examined from Satus Pass, 947 m, Klickitat Co., Washington. Adults have been collected on *Quercus douglasii* H.&A., *Q. garryana* Dougl., and *Q. kelloggii* Newb. I have examined several hundred specimens with collection dates from May 1 to August 1.

Phytocoris hettenshawii Bliven

Figures 47, 48, 51

Phytocoris hettenshawii Bliven, 1956: 18, 19, pl. II, fig. 11.

TYPES: This species was described from 16 specimens collected near the Hettenshaw Valley, Van Duzen Rd., Trinity Co., California, 4 July–15 August, 1943, 1949–1951, ex. *Arctostaphylos* sp., B. P. Bliven. The male holotype (15 August 1951), allotype, and all 14 paratypes are deposited in the collection of the CAS.

DIAGNOSIS: Length 6.7–8.5. *Phytocoris hettenshawii* is very similar to *cunealis* and *sewardi* but can usually be distinguished by the more reddish general coloration and shorter bristlelike setae on the legs and first antennal segment. Positive identification, however, depends on examination of male genital structures. The shapes of the left and right sclerotized processes (fig. 51e, h) separate *hettenshawii* from *sewardi*, and the small middle left sclerotized process (fig. 51f) distinguishes it from *cunealis*. The left genital tubercle (fig. 51a) is usually distinctly smaller than for either *cunealis* or *sewardi*, but there is some

variation in its size. The genital parameres of all three taxa are very similar.

DISCUSSION: *Phytocoris hettenshawii* is distributed throughout the coastal mountain ranges, Cascade Range, and Sierra Nevada Mts. of California. The distribution extends north to Curry, Jackson, Josephine, and Klamath counties in southwestern Oregon; and east to Washoe Co., Nevada. I have examined 160 specimens with collection dates from May 6 to September 9.

Phytocoris hettenshawii is the only member of the *cunealis* group that does not inhabit plants belonging to the family Fagaceae. Adults and nymphs of *hettenshawii* have been collected only from *Arctostaphylos*. Besides the male genitalic structures, habitat is perhaps the most reliable character for distinguishing *hettenshawii* from other *cunealis* group species.

***Phytocoris rubrimaculatus*, new species**

Figure 52

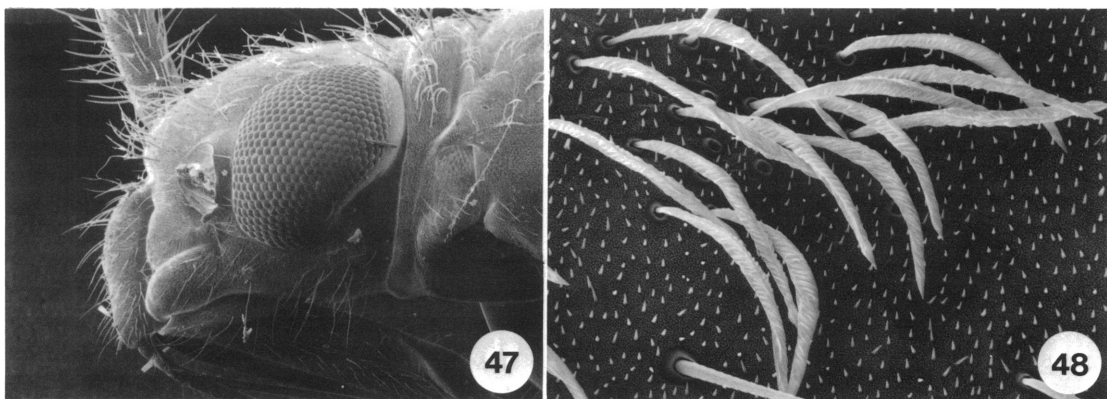
HOLOTYPE MALE: Mt. Palomar, San Diego Co., California, 18 July 1963, R. L. Langston (UCB).

PARATYPES: CALIFORNIA. **Los Angeles Co.:** 1 male, 2 females, Camp Baldy, 26 June 1950, W. C. Bentinck (OSU, UCB); 1 male, Camp Baldy, 14 June 1926, L. J. Muchmore (LACM); 1 female, Mt. Baldy, 21 June 1931 (LACM); Tanbark Flat, 1 male, 7 July 1950, H. L. Hansen (OSU) and 1 female, 24 June 1952, J. J. Menn (UCB). **Riverside Co.:** San

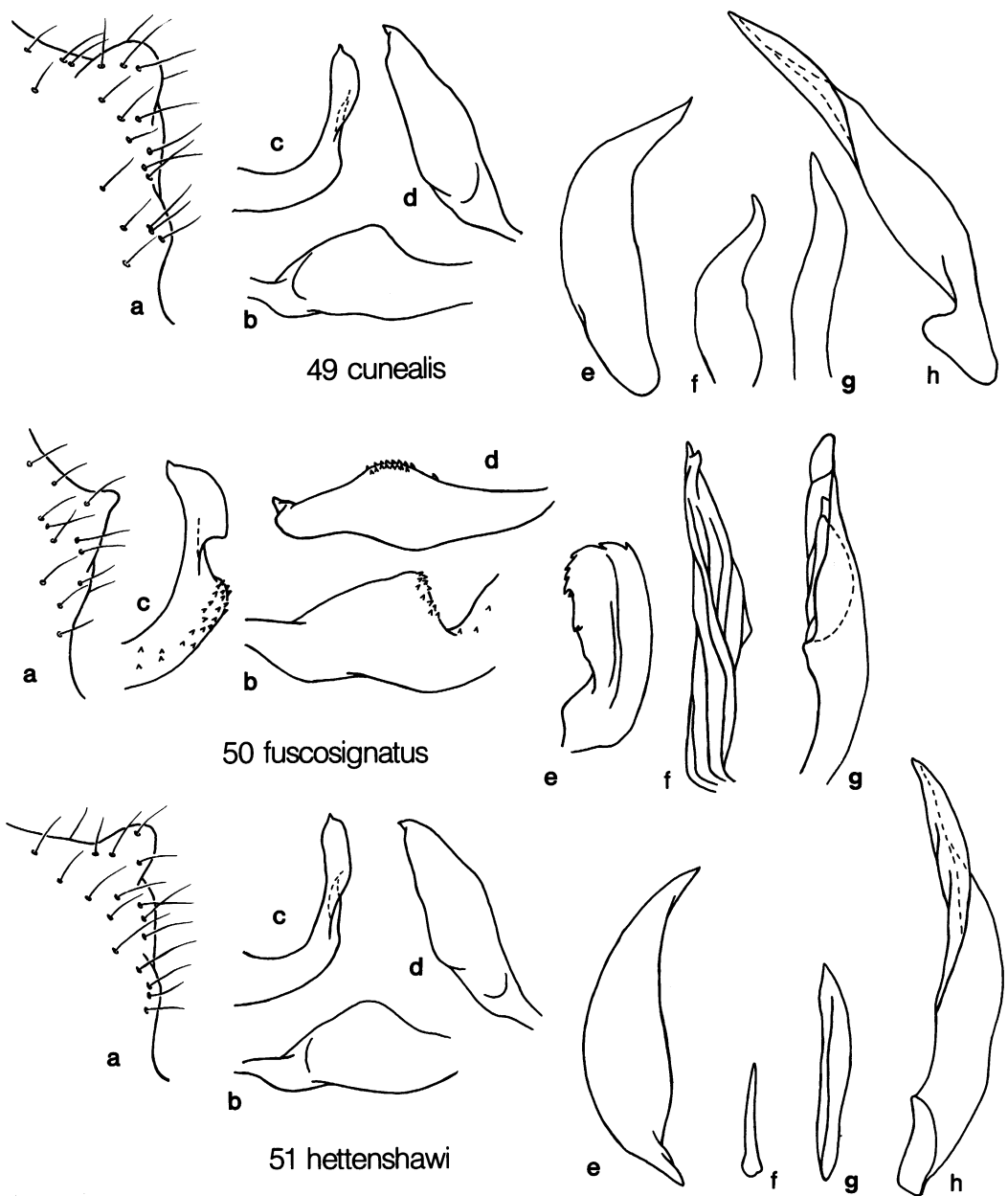
Jacinto Mts.: 1 male, 2 females, 21 July 1929, R. H. Beamer (KU); 1 male, 1 female, Dark Cyn., 21 June 1940, ex. *Quercus* sp., F. H. Rindge (UCB); 1 female, San Jacinto R., 915 m, 30 May 1940, R. L. Usinger (UCB). **San Bernardino Co.:** San Bernardino Mts.: 1 female, Camp O-ongo, near Running Spgs., 1920 m, 7–14 August 1965, C. L. Hogue (LACM); 1 female, 19 July 1941, 1 female, 31 July 1951, 1 male, 1 female, 26 July 1952, and 1 female, 17 July 1953, Mill Crk., 1920 m, ex. *Quercus chrysolepis* Liebm., Timberlake (UCR); 1 female, Big Bear Lk., 26 July 1932, R. H. Beamer (KU); 2 males, 1 female, 2 mi E Camp Angelus, 28 June 1978, ex. *Quercus chrysolepis*, J. D. Pinto (UCR); 1 male, S Fork Santa Ana R., 16 August 1945, A. L. Melander (USNM). **San Diego Co.:** 1 male, Cuyamaca Lk., 6 July 1929, R. H. Beamer (OSU); 1 male, Nate Harrison Grade, near Mt. Palomar, 1097 m, 2 June 1968, at UV light, L. Brattsen (UCR).

DIAGNOSIS: *Phytocoris rubrimaculatus* is distinguished from other species of the *cunealis* group by the red or reddish orange mottled pattern on the pronotal disk and hemelytra, and by the absence of a distinct tubercle above the base of the left paramere (fig. 52a). Externally, this species closely resembles *rufoscriptus*, but is distinguished by the absence of dark setose spots along the posterior submargin of the pronotal disk.

DESCRIPTION: *Male.* Length 6.53–7.40, width 2.16–2.43; pale yellow ground color with red or reddish orange markings. **Head:**



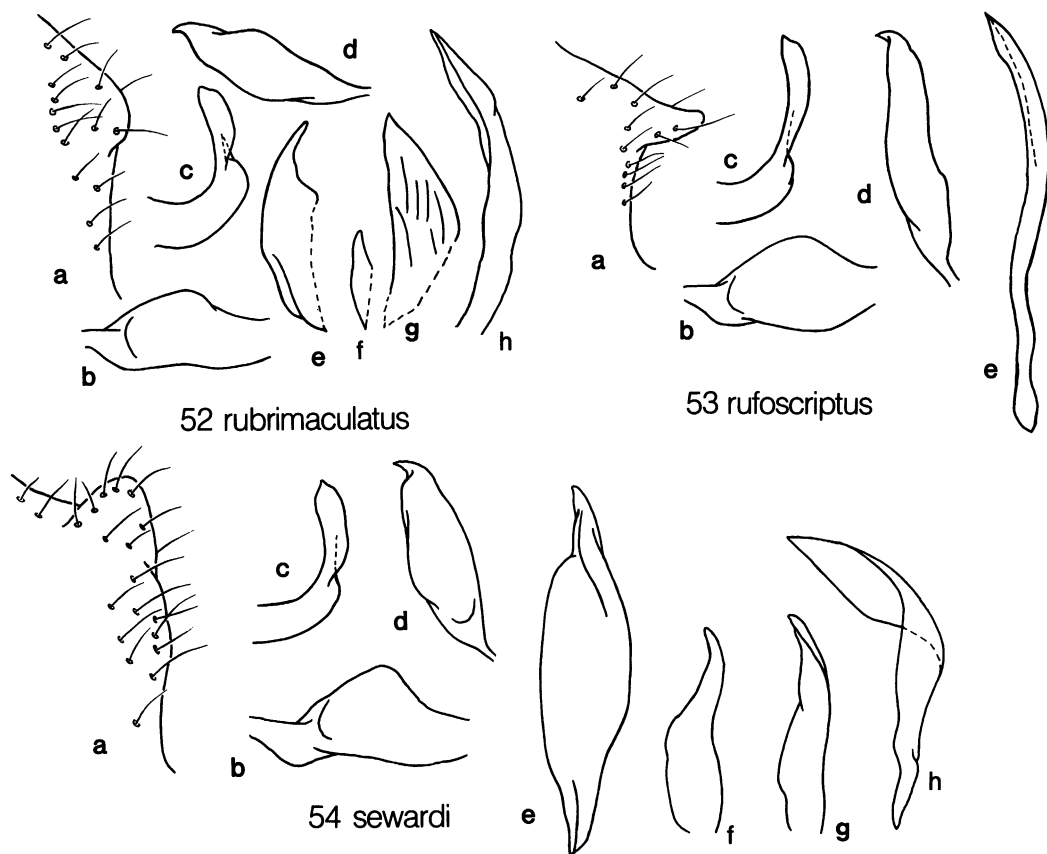
Figs. 47, 48. *Phytocoris hettenshawii*. 47. Lateral view of head. 48. Dorsal vestiture.



Figs. 49–51. Male genitalia of *cunealis* group species. 49. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e–h. Sclerotized processes of vesica. e. Left. f. Left-medial. g. Right-medial. h. Right. 50. a–d as in fig. 49. e–g. Sclerotized processes. e. Left. f. Middle. g. Right. 51. a–h as in fig. 49.

width across eyes 0.98–1.04, vertex 0.42–0.45; pale yellow, lightly marked with red or reddish orange; frons moderately convex, set

with long pale setae, sometimes with several faint reddish striae. **Rostrum:** length 3.28–3.47, reaching sixth or seventh abdominal



Figs. 52–54. Male genitalia of *cunealis* group species. 52. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e–h. Sclerotized processes of vesica. e. Left. f. Left-medial. g. Right-medial. h. Right. 53. a–d as in fig. 52. e. Sclerotized process of vesica. 54. a–h as in fig. 52.

segment. **Antennae:** brownish yellow; I, length 1.78–2.03, sparsely set with long bristlelike pale setae; II, length 3.36–3.73; III, length 1.93–2.23; IV, length 0.99–1.19. **Pronotum:** mesal length 0.97–1.08, posterior width 1.62–1.82; disk mottled with red or reddish orange but leaving distinct pale patches; collar extensively reddened, with pale spot medially; calli mostly pale; propleura pale yellow, often lightly marked with red. **Scutellum:** weakly convex; white or pale yellow, usually lightly marked or tinged with pale brownish orange. **Hemelytra:** white or pale yellow, mottled with reddish orange or pale brownish orange; corium with large, oblique red mark medially; cuneus moderately to densely sprinkled with small red spots; membrane conspurcate. **Legs:** femora pale yellow; hind femora reticulated

with red or reddish brown, mostly on distal half; tibiae uniformly pale. **Vestiture:** dorsum with pale, simple setae and silvery white, sericeous setae. **Genitalia:** Figure 52.

Female. Similar to male in color, vestiture, and structure. Length 7.02–7.78, width 2.39–2.65. **Head:** width across eyes 1.02–1.09, vertex 0.45–0.50. **Rostrum:** length 3.42–3.74, reaching fifth or sixth abdominal segment. **Antennae:** I, 1.98–2.29; II, 3.46–3.87; III, 2.11–2.32; IV, 1.17–1.35. **Pronotum:** mesal length 1.01–1.19, posterior width 1.62–1.91.

ETYMOLOGY: From the Latin, *ruber* (red) and *maculatus* (spotted), to describe the mottled, reddish markings on the dorsum.

DISCUSSION: This species is distributed in the southwestern mountain ranges of California from Los Angeles County to San Diego

County. Adults have been collected from canyon oak, *Quercus chrysolepis*. The period of occurrence is from May 30 to August 16.

Phytocoris rufoscriptus Van Duzee

Figure 53

Phytocoris rufoscriptus Van Duzee, 1914: 15, 16; 1917a: 319. – Carvalho, 1959: 215. – Knight, 1968: 215. – Henry and Stonedahl, 1983: 459.

TYPES: Described from five males and one female taken near Alpine Heights, 8 June 1913 and 6 June 1914, and Mussey's, 13 April 1913, San Diego Co., California, E. P. Van Duzee. Van Duzee (1914) did not designate a type at the time of publication, but he did select a lectotype (no. 2007) and "allotype" (no. 2008) at a later date; the remaining specimens of the syntype series were tagged with orange "paratype" labels. These type designations were never published. The male specimen selected as a lectotype by Van Duzee is designated as such by Henry and Stonedahl (1983). The lectotype and three paralectotypes are retained in the CAS collection and one paralectotype is deposited in the Knight Collection (USNM). The remaining specimen of the original syntype series was not located.

DIAGNOSIS: Length 7.0–7.9. *Phytocoris rufoscriptus* is distinguished from other species of the *cunealis* group by the setose, fuscous spots along the posterior submargin of the pronotal disk; narrow, posteriorly directed left genital tubercle (fig. 53a); and single sclerotized process of the vesica (fig. 53e). The right distal region of the primary membranous sac of the vesica is narrowly sclerotized, and the left basal lobe is set with a large patch of spinulae. The dorsal surface of *rufoscriptus* is mottled or reticulated with red as in *rubrimaculatus*, but the latter species lacks the dark

setose spots on the posterior submargin of the pronotal disk.

DISCUSSION: *Phytocoris rufoscriptus* is distributed in the chaparral zone of southwestern California from San Luis Obispo County to San Diego County. The host plant is coast live oak, *Quercus agrifolia* Nee. I have examined 76 specimens with collections dates from March 27 to August 9.

Phytocoris sewardi Bliven

Figures 5, 54

Phytocoris sewardi Bliven, 1966: 116, 117.

TYPES: *Phytocoris sewardi* was described from a single female collected at Blocksburg, Humboldt Co., California, 30 June 1957, on "tanbark oak," B. P. Bliven. The holotype (no. 13878) is retained in the collection of the CAS.

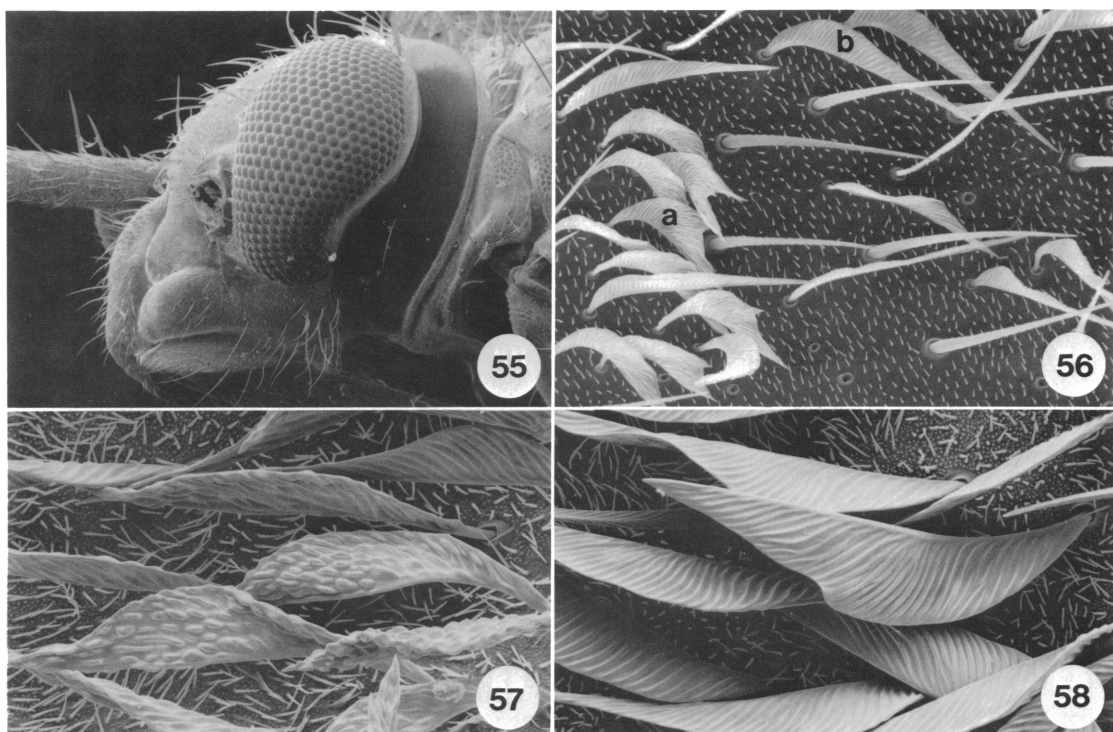
DIAGNOSIS: Length 6.7–7.9. Externally, this species is very similar to *cunealis* and *het-tenshawii*, but is distinguished by the shorter, strongly curved right sclerotized process of the vesica (fig. 54h) and shape of the left sclerotized process (fig. 54e).

DISCUSSION: *Phytocoris sewardi* is distributed in coastal mountain ranges of Oregon and California, and along the western slopes of the Cascade Range and the Sierra Nevada Mts. The northernmost records are from Benton and Linn counties in Oregon. The distribution extends south to Kern and Los Angeles counties in California. Adults and nymphs have been taken on *Castanopsis chrysophylla* (Dougl.) A. DC. Several adults also were collected from *Lithocarpus densiflora* (H.&A.) Rehd. and *Quercus chrysolepis* Liebm. I have examined 100 specimens with collection dates from April 26 to September 4.

FRATERCULUS SPECIES-GROUP

DIAGNOSIS: Recognized by the short head with weakly to moderately protruding frons and tylus (fig. 55); large eyes; posterior submargin of pronotal disk usually with several weakly elevated, tumid points; dorsum with two types of distinctly asymmetrical, scale-like setae (figs. 56–58); and male genitalia with the following characteristics: genital

capsule sometimes broadly swollen above paramere bases but without prominent tubercles; left paramere with stout, often spine-like tubercles on inner-distal surface of sensory lobe and base of shaft, dorsal margin of sensory lobe usually somewhat carinate; right paramere broad, with stout tubercles on inner-dorsal surface; vesica usually with broad-



Figs. 55–58. *Fraterculus* group species. 55. *fraterculus*, lateral view of head. 56. *mellarius*, dorsal vestiture: a, white scalelike setae; b, golden scalelike setae. 57, 58. *heidemanni*, dorsal vestiture. 57. white scalelike setae. 58. black scalelike setae.

ly attached, straplike sclerite on inner-medial surface; and sclerotized process of vesica bulbous basally with tapered distal half.

DESCRIPTION: Small to large, 4.4–8.8, brown, brownish orange, or grayish brown species; vestiture of dorsum with golden to dark brown simple setae, silvery white scalelike setae with irregular ridges sometimes breaking into pustules, and golden (pale species) to dark brown or black (dark species), scalelike setae with oblique ridges—both types of scalelike setae strongly asymmetrical. **Head:** short, height noticeably greater than length in lateral view, frons weakly to moderately produced anteriad of antennal fossae; antennae yellowish brown to fuscous; segment I with scattered pale spots on dorsal aspect; segment II sometimes with pale, median annulus; tylus weakly to moderately produced, meeting frons along shallow depression; eyes occupying two-thirds to three-fourths of head height in lateral view; gula narrowly developed. **Pronotum:** disk

uniformly pale to extensively infuscated; posterior submargin of disk of darker species with transverse, fuscous band or 4–6 weakly elevated, darkened, tumid points; propleura uniformly pale to broadly fuscous basally, apical fourth to one-third always pale. **Hemelytra:** variously colored and marked; corium usually with distinct pale region medially and apically; membrane sparsely to densely conspurcate, spots sometimes coalescing to form larger fuscous maculae. **Legs:** femora pale, moderately to extensively darkened with red, brown, or dark brown—darkened regions usually interrupted by pale spots; hind femora sometimes with pale, preapical band; tibiae uniformly pale to extensively darkened, and marked with pale spots; front and middle tibiae sometimes with alternating light and dark annuli. **Male genitalia:** genital capsule without prominent tubercles but sometimes broadly swollen or with low, carinate protuberance above paramere bases. *Left paramere:* sensory lobe prominent, dorsal

margin usually somewhat carinate; inner-distal surface of sensory lobe and base of shaft with stout, spinelike tubercles; shaft usually slightly to moderately expanded distally in dorsal view, outer margin of expanded region flattened dorsoventrally; apex truncate, broadly rounded, or rarely acute in lateral view. *Right paramere*: broad, with weakly to strongly arched dorsal margin; sometimes with knoblike protuberance dorsally; inner-distal surface usually with series of stout tubercles. *Vesica*: primary membranous sac multilobed, lobes usually with patches or elongate rows of small tubercles; inner-medial surface of primary sac usually with broadly attached, straplike sclerite, sometimes extending to near apex of sac; basal process well sclerotized, extending to level of gonopore or slightly beyond; sclerotized process, except *chihuahuanae*, bulbous and hollow basally, open along narrow slit for much of length, tapering distally, apex acute.

DISCUSSION: Members of the *fraterculus* group are widely distributed in western North America with several species also occurring east of the Rocky Mts. All species, except *inops*, are associated with coniferous host plants, mostly in the genus *Pinus*. The majority of species appear to be restricted to a single plant species, but some occur regularly on several hosts. Furthermore, it is not uncommon to find two or three members of this group occurring together on the same host plant. In most cases, the co-occurring species seem to be occupying different portions of the host plant (e.g., bole and branches, foliage, cones). In instances where co-occurring species appear to have similar habitat requirements, their seasonal occurrences are generally found to be only narrowly overlapping, so that they are temporally isolated for much of the season.

The species of the *fraterculus* group are highly variable in size and general coloration, but are easily recognized by the genitalic characters given in the group diagnosis. *Fraterculus* group species are most closely related to members of the *aurora*, *conspurcatus*, and *juniperanus* groups, sharing with these taxa a unique dorsal vestiture which includes two types of strongly asymmetrical, broad, scalelike setae (see group description). All other *Phytocoris* species treated in this study have

thicker, mostly symmetrical, sericeous setae, or less commonly, weakly asymmetrical, narrow, scalelike setae (see also *tenuis* group discussion).

KEY TO SPECIES OF
THE *FRATERCULUS* GROUP

Portions of the following key allow for the separation of male specimens only based on genitalic characters.

- 1 Posterior submargin of pronotal disk with transverse, fuscous line or series of dark patches; or disk broadly fuscous basally 2
- Posterior submargin of pronotal disk pale, without fuscous markings 14
- 2(1) Front tibiae with two or three pale annuli 3
- Front tibiae with pallid spots but lacking distinct pale annuli *politus* Reuter
- 3(2) Ratio of length of first antennal segment to width of head across eyes less than or equal to 1.10:1 4
- Ratio of length of first antennal segment to width of head across eyes greater than 1.10:1 7
- 4(3) Second antennal segment dark reddish brown or fuscous, usually with pale median annulus; dorsal margin of arm of right paramere strongly and broadly arched (fig. 77c), without knoblike process *umbrosus* Knight
- Second antennal segment brown or yellowish brown, without pale median annulus; dorsal margin of arm of right paramere weakly arched, with small knoblike process (figs. 60c, 69c, 76c) ...
- 5(4) Ratio of length of first antennal segment to width of head across eyes 0.69:1 to 0.85:1 for males and 0.75:1 to 0.92:1 for females; veins of hemelytral membrane brown or yellowish brown, sometimes lightly tinged with red; genital capsule weakly swollen on left distal margin above paramere base; body length 4.48–6.25 6
- Ratio of length of first antennal segment to width of head across eyes 0.94:1 to 1.01:1 for males and 1.06:1 to 1.13:1 for females; veins of hemelytral membrane dark red; genital capsule with large, angulate swelling above left paramere base; body length 6.05–6.95 .. *kuschei* n. sp.
- 6(5) Sensory lobe of left paramere prominent, dorsal margin not noticeably carinate

- (fig. 60a); sclerotized process of vesica flattened, apex broadly rounded (fig. 60d) *chihuahuanae* n. sp.
- Sensory lobe of left paramere less prominent, dorsal margin carinate (fig. 76a); sclerotized process of vesica bulbous and hollow basally, tapering distally to acute apex (fig. 76d) *simulatus* Knight
- 7(3) Right paramere elongate, length at least three times greatest width (figs. 67c, 75c) 8
- Right paramere broad, length not more than 2.5 times greatest width (fig. 65d, e) 9
- 8(7) Pale annuli on front tibiae narrower than dark annuli; veins of hemelytral membrane marked or tinged with red; shaft of left paramere slightly expanded distally (fig. 67b) *inops* Uhler
- Pale and dark annuli on front tibiae similar in width; veins of hemelytral membrane without red markings; shaft of left paramere greatly expanded distally (fig. 75b) *schuhi* n. sp.
- 9(7) Left paramere with prominent ridgelike process on dorsal surface of shaft base, margin with 3–5 small serrations (fig. 64b, c) *corticola* n. sp.
- Left paramere without ridgelike process on shaft base but sometimes with large blunt tubercle (fig. 62b) or series of spines (fig. 65c, 74b) 10
- 10(9) Scutellum strongly convex, abruptly deflexed distally, sloping steeply to apex 11
- Scutellum weakly to moderately convex, sloping gradually to apex, not abruptly deflexed distally 13
- 11(10) Genital capsule with ridgelike protuberance above base of left paramere; shaft of left paramere expanded on outer distal margin (figs. 62b, 66b); right paramere with rounded ventral margin (figs. 62c, 66c) 12
- Genital capsule without ridgelike protuberance above base of left paramere; shaft of left paramere not expanded on outer distal margin (fig. 74b); right paramere with angulate ventral margin (fig. 74c); sclerotized process of vesica as in figure 74d *praealtus* n. sp.
- 12(11) Shaft of left paramere with large, sometimes spinose tubercle basally (fig. 62b); basal half of sclerotized process oblong (fig. 62d) *commissuralis* Van D.
- Shaft of left paramere with series of spines basally (fig. 66b), sometimes grouped together forming small tubercle; basal half of sclerotized process nearly spherical (fig. 66d) *heidemanni* Reuter
- 13(10) Pale annuli on front tibiae narrower than dark annuli; shaft of left paramere expanded distally (fig. 65c) *fraterculus* Van D.
- Pale and dark annuli on front tibiae similar in width; shaft of left paramere not expanded distally (fig. 72b) *piceicola* Knight
- 14(1) Ratio of length of first antennal segment to width of head across eyes less than or equal to 1.05:1 for males and 1.20:1 for females 15
- Ratio of length of first antennal segment to width of head across eyes greater than 1.05:1 for males and 1.20:1 for females 18
- 15(14) Cuneus extensively marked with red .. 16
- Cuneus without red markings *mellarius* Knight
- 16(15) Length 4.7–5.5 *comulus* Knight
- Length 5.6–7.0 17
- 17(16) Shaft of left paramere slightly expanded medially (fig. 68b); dorsal margin of arm of right paramere with knoblike process (fig. 68c) *jucundus* Van D.
- Shaft of left paramere not expanded medially (fig. 61b); arm of right paramere without dorsal process (fig. 61c) *cochise* n. sp.
- 18(14) Shaft of left paramere narrowly expanded distally (fig. 59b); dorsal margin of arm of right paramere with knoblike process (fig. 59c) *auranti* n. sp.
- Shaft of left paramere broadly expanded distally (fig. 71b); arm of right paramere without dorsal process (fig. 71c) *mirus* Knight

Phytocoris auranti, new species

Figure 59

HOLOTYPE MALE: Deer Pk., Chiricahua Mts., 2743–2987 m, Cochise Co., Arizona, 30 July 1927, J. A. Kutsche (CAS).

PARATYPES: ARIZONA. Cochise Co.: Chiricahua Mts.: 7 males, same data as holotype (CAS, OSU); 4 males, Turkey Flat, 2438–2743 m, 22 July 1927, J. A. Kutsche (CAS); 1 male, Rustler Pk., 2438–2743 m, 26 July 1927, J. A. Kutsche (CAS).

DIAGNOSIS: *Phytocoris auranti* is distinguished from other species of the *fraterculus* group by the following combination of characters: brownish orange general coloration; posterior submargin of pronotal disk without

fuscous markings; ratio of length of first antennal segment to width of head across eyes greater than 1.05:1 for males and 1.20:1 for females; shaft of left paramere narrowly expanded distally (fig. 59b); and arm of right paramere without or with weakly developed dorsal process (fig. 59c).

DESCRIPTION: *Male.* Length 7.29–8.15, width 2.27–2.41; brownish orange general coloration. **Head:** width across eyes 1.11–1.17, vertex 0.36–0.38; pale yellow with red markings; frons with 6–8 red striae laterally. **Rostrum:** length 3.24–3.49, reaching fifth or sixth abdominal segment. **Antennae:** brownish yellow; I, length 1.33–1.46, lightly tinged with red and marked with pale spots; II, length 3.19–3.38; III, length 1.44–1.69; IV, length 1.04–1.13. **Pronotum:** mesal length 1.01–1.13, posterior width 1.82–2.02; disk brownish orange, region behind calli sometimes lighter, brownish yellow. **Scutellum:** uniformly brownish yellow to brownish orange. **Hemelytra:** brownish orange, confusedly sprinkled with small, red flecks; apex of corium with large pale patch; cuneus more deeply reddened; membrane dusky, veins reddish. **Legs:** femora pale yellow to brownish yellow, reticulated with red or reddish brown and marked with pale spots; tibiae uniformly pale yellow. **Vestiture:** dorsum with pale, simple setae; golden, scalelike setae; and patches of silvery white, scalelike setae. **Genitalia:** Figure 59.

Female. Similar to male in color, vestiture, and structure. Length 6.91–7.40, width 2.21–2.36. **Head:** width across eyes 1.04–1.09, vertex 0.43–0.45. **Rostrum:** length 3.33–3.46, reaching base of ovipositor or slightly beyond. **Antennae:** I, 1.46–1.51; II, 3.24–3.55; III, 1.62–1.69; IV, 1.08–1.17. **Pronotum:** mesal length 0.95–1.08, posterior width 1.76–1.87.

ETYMOLOGY: From the Latin, *aurantium* (orange), referring to the general coloration.

DISCUSSION: This species is known from specimens collected in the Chiricahua Mts., Huachuca Mts., and Pinaleno Mts. of southeastern Arizona. Although the host plant is not known, *auranti* most likely occurs on a conifer, possibly *Picea engelmannii* Parry. Several males have been taken at light.

ADDITIONAL SPECIMENS: 11 specimens were examined from the following localities: AR-

IZONA. **Cochise Co.:** Chiricahua Mts., Rustlers Pk. (OSU); Chiricahua Mts., trail from Rustlers Pk. to Fly Peak (UCR); Huachuca Mts., Carr Cyn. (CAS); 1.5 mi E Onion Saddle (AMNH). **Graham Co.:** Pinaleno Mts., Arcadia For. Cmp. (UAZ). The period of occurrence is from June 13 to August 31. Specimens were collected at elevations between 2042 and 2743 m.

Phytocoris chihuahuanae, new species

Figure 60

HOLOTYPE MALE: 10 mi W of Portal, 2000 m, Cochise Co., Arizona, 11 June 1980, ex. *Pinus chihuahuana* Engelm., R. T. Schuh, K. and R. Schmidt (AMNH).

PARATYPES: 11 males, 21 females, same data as holotype (AMNH, CAS, OSU, USNM).

DIAGNOSIS: *Phytocoris chihuahuanae* is distinguished from other members of the *fraterculus* group by the following combination of characters: posterior submargin of pronotal disk with series of fuscous patches; length of antennal segment I less than width of head across eyes (ratio—0.69:1 to 0.76:1, males; 0.76:1 to 0.81:1, females); antennal segment II yellowish brown, without pale median annulus; and male genitalia with prominent sensory lobe on left paramere (fig. 60a) and flattened sclerotized process of vesica with broad, rounded apex (fig. 60d).

DESCRIPTION: *Male.* Length 4.48–5.40, width 1.44–1.73; brownish yellow general coloration with red and brown markings. **Head:** width across eyes 0.91–0.99, vertex 0.24–0.31; pale yellow with red markings. **Rostrum:** length 2.21–2.43, reaching seventh or eighth abdominal segment. **Antennae:** I, length 0.63–0.74, dark brown with pale maculae, sometimes tinged with red; II, length 2.01–2.38, yellowish brown; III, length 0.94–1.08, brown or yellowish brown; IV, length 0.83–0.90, brown or yellowish brown. **Pronotum:** mesal length 0.66–0.84, posterior width 1.18–1.42; disk pale brownish yellow, posterior submargin with 4–6 fuscous patches; propleura brown, apical third pale. **Scutellum:** pale yellow, lightly tinged with red or reddish brown, sometimes with dusky spot either side before apex. **Hemelytra:** pale brownish yellow; clavus and corium with dark

brown markings; outer margin of corium and apical half of cuneus marked with red; membrane conspurcate, veins yellow, sometimes tinged with red. **Legs:** femora pale yellow, reticulated with reddish brown or fuscous, sometimes with bright red markings; tibiae pale with reddish brown to fuscous markings; front tibiae with four dark annuli including narrow band at base. **Vestiture:** dorsum with brown, simple setae, golden brown to dark brown scalelike setae, and silvery white scalelike setae. **Genitalia:** Figure 60.

Female. Similar to male in color, vestiture, and structure. Length 4.48–5.34, width 1.55–1.80. **Head:** width across eyes 0.89–0.96, vertex 0.33–0.37. **Rostrum:** length 2.39–2.50, reaching base of ovipositor. **Antennae:** I, 0.68–0.78; II, 2.12–2.38; III, 1.04–1.12; IV, 0.89–0.95. **Pronotum:** mesal length 0.72–0.82, posterior width 1.31–1.43.

ETYMOLOGY: Named for its host plant.

DISCUSSION: *Phytocoris chihuahuanae* is known from mountainous regions of southeastern Arizona, but probably occurs in southwestern New Mexico and northern Mexico as well. The host plant of this species is *Pinus chihuahuana* Engelm.

ADDITIONAL SPECIMENS: 18 specimens were examined from the following localities: ARIZONA. **Apache Co.:** St. John (KU). **Cochise Co.:** Chiricahua Nat. Mon. (KU); Chiricahua Mts., Cave Crk. Cyn. (USU); Huachuca Mts. (ASU, KU); 4 mi W Portal (AMNH). **Santa Cruz Co.:** Nogales, Mt. Washington (CAS); Santa Rita Mts. (CAS). The period of occurrence is from June 9 to August 24.

Phytocoris cochise, new species

Figure 61

HOLOTYPE MALE: Rustler Pk., Chiricahua Mts., 2500 m, Cochise Co., Arizona, 17 August 1952, H. B. Leech and J. W. Green (CAS).

PARATYPES: ARIZONA. **Cochise Co.:** Chiricahua Mts.: 4 males, 4 females, same data as holotype (CAS, OSU); 1 male, 1 female, 12 August 1937, E. D. Ball (UAZ); 1 male, Bar Foot Ridge, 2440 m, 29 July 1927, J. A. Kutsche (CAS); 1 female, *ibid.*, except 2590–2960 m, 5 August 1927 (CAS); 1 female, Deer Pk., 2440 m, 7 July 1927, J. A. Kutsche (CAS); 1 male, Rustler Pk., 2440–2745 m, 26 July 1927, J. A. Kutsche (CAS); 2 males, 1 female,

trail from Rustler Pk. to Fly Peak, 2438–2743 m, 31 August 1976, J. D. Pinto (UCR).

DIAGNOSIS: Externally, *cochise* closely resembles *mirus* and *auranti* but is distinguished by the short first antennal segment; black scalelike setae on the pronotal disk, cuneus, and outer margin of corium; and shaft of left paramere not expanded distally (fig. 61b). *Phytocoris cochise* also resembles *jucundus* but is differentiated by the black scalelike setae on the dorsum, and strongly arched arm of the right paramere, without knoblike dorsal process (fig. 61c).

DESCRIPTION: **Male.** Length 6.53–7.02, width 2.12–2.20; brownish orange general coloration. **Head:** width across eyes 1.12–1.17, vertex 0.34–0.35; pale yellow with red markings; frons with numerous long, pale setae. **Rostrum:** length 2.25–2.36, reaching between hind coxae. **Antennae:** brownish yellow; I, length 1.08–1.22, reticulated with reddish brown, leaving pale spots; II, length 2.59–2.74; III, length 1.08–1.19; IV, length 0.83–0.90. **Pronotum:** mesal length 0.90–0.99, posterior width 1.67–1.85; disk pale grayish yellow with reddish brown markings. **Scutellum:** grayish yellow, sometimes lightly flecked with red or reddish brown. **Hemelytra:** grayish yellow with red or reddish brown markings; apical half of clavus with white spots, particularly along commissure; cuneus densely marked with red; membrane dusky, sometimes lightly conspurcate, veins reddish. **Legs:** femora pale grayish yellow, reticulated with reddish brown, marked with pale spots apically; hind femora often extensively reddened; tibiae pale yellow, lightly mottled with reddish brown and marked with pale spots. **Vestiture:** dorsum with pale to golden brown, simple setae and white to golden, scalelike setae; pronotal disk, cuneus, and outer margin of corium with scattered black, scalelike setae. **Genitalia:** Figure 61.

Female. Similar to male in color, vestiture, and structure. Length 6.26–6.42, width 2.11–2.27. **Head:** width across eyes 1.06–1.09, vertex 0.44–0.46. **Rostrum:** length 2.36–2.41, reaching between hind coxae or slightly beyond. **Antennae:** I, 1.17–1.24; II, 2.29–2.47; III, 1.08–1.17; IV, 0.79–0.92. **Pronotum:** mesal length 0.90–0.92, posterior width 1.66–1.76.

ETYMOLOGY: Named for the county in Ar-

izona where all known specimens have been collected; a noun in apposition.

DISCUSSION: *Phytocoris cochise* is known only from the type material collected in the Chiricahua Mts., Cochise Co., Arizona. The host plant is not known, but I expect this species inhabits a conifer, most likely a species of *Pinus*.

Phytocoris commissuralis Van Duzee

Figure 62

Phytocoris commissuralis Van Duzee, 1920: 351. – Downes, 1924: 29. – Carvalho, 1959: 194. – Knight, 1968: 250, fig. 306.

TYPES: Described from two males and two females collected by E. P. Van Duzee at Huntington Lake, 2134 m, Fresno Co., California, 24 July 1919. The male holotype (no. 705), allotype (no. 706), and a single female paratype are deposited in the Van Duzee Collection (CAS). The male paratype is retained in the Knight Collection (USNM).

DIAGNOSIS: Length 7.5–8.7. Similar to *heidemanni* but distinguished by the structure of the male genitalia: shaft of left paramere with large, often spinose, tubercle basodorsally (fig. 62b); dorsal process on arm of right paramere weakly produced (fig. 62c); basal half of sclerotized process of vesica oblong (fig. 62d), rather than spherical as in *heidemanni*.

DISCUSSION: *Phytocoris commissuralis* is known from the Sierra Nevada Mts., San Gabriel Mts., and San Bernardino Mts. of California. Downes (1924) reported this species from Victoria, British Columbia, but *commissuralis* probably does not occur that far north. The only host plant record is a label reading "*Pinus*" on a specimen from Crystal Lk., Los Angeles Co., California. Several specimens have been taken at light. I have examined a dozen specimens with collection dates from May 8 to September 2.

Phytocoris comulus Knight

Figure 63

Phytocoris comulus Knight, 1928: 38, 39. – Carvalho, 1959: 194. – Knight, 1968: 223.

TYPES: Described from 30 specimens collected in Arizona, Colorado, Nebraska, and New Mexico. The male holotype, allotype,

and two female paratypes were taken at Durango, La Plata Co., Colorado, 13 August 1925, H. H. Knight, ex. *Pinus edulis* Engelm. All type material is deposited in the Knight Collection (USNM); 15 paratypes were not located.

DIAGNOSIS: Similar to *cochise* but smaller, length 4.7–5.5, and with darker, reddish brown or dark brown markings on the legs and first antennal segment. The banded front tibiae and large pale region between the eyes will further differentiate this species from *cochise*. The genital structures of the male (fig. 63) are very similar to those of *umbrosus*.

DISCUSSION: *Phytocoris comulus* is widely distributed in Arizona and Colorado on *Pinus edulis* Engelm. and *P. ponderosa* Dougl. Specimens also have been collected in Sioux Co., Nebraska; San Miguel Co., New Mexico; Daggett Co. and Sevier Co., Utah; and Fremont Co., Wyoming. In Arizona, this species occurs as far south as the Chiricahua Mts. and is distributed north and west to the Grand Canyon. Several specimens from the Uinta Mts., Daggett Co., Utah were collected on *Pinus contorta* Dougl. I have examined 86 specimens with collection dates from June 10 to October 6.

Phytocoris corticola, new species

Figure 64

HOLOTYPE MALE: Lehman Crk. Cmpgd., Humboldt Nat. For., 2322 m, White Pine Co., Nevada, 14 July 1980, ex. *Pinus monophylla* Torr. & Frem., G. M. Stonedahl and R. T. Schuh (AMNH).

PARATYPES: 21 males, 6 females, same data as holotype except 9 males and 2 females collected at UV light (AMNH, CAS, JTP, OSU, USNM).

DIAGNOSIS: *Phytocoris corticola* is distinguished from other large, gray or brown species of the *fraterculus* group by the structure of the male genitalia: shaft base of left paramere with prominent, ridgelike process dorsally (fig. 64b, c); arm of right paramere without dorsal, knoblike process (fig. 64d); right basal lobe of vesica with series of small spines.

DESCRIPTION: *Male*. Length 8.37–8.91, width 2.65–2.81; brown or grayish brown general coloration. **Head**: width across eyes

1.31–1.35, vertex 0.43–0.47. **Rostrum:** length 4.10–4.27, reaching seventh or eighth abdominal segment. **Antennae:** dark brown; I, length 1.66–1.82; II, length 3.72–3.94; III, length 1.80–1.96; IV, length 1.17–1.28. **Pronotum:** mesal length 1.26–1.27, posterior width 2.14–2.27; disk extensively darkened, posterior submargin with transverse fuscous line, sometimes dissected into 4–6 fuscous patches; propleura fuscous, apical third pale. **Scutellum:** grayish white, lightly to densely mottled with fuscous, sometimes almost entirely darkened but leaving median line pale. **Hemelytra:** grayish yellow, clavus and corium extensively darkened with brown or fuscous; membrane densely conspurcate, veins fuscous. **Legs:** femora mostly brown or fuscous, marked with pale spots; hind femora without pale preapical band; tibiae extensively darkened and marked with pale spots; front and middle tibiae with two or three pale annuli. **Vestiture:** dorsum with black simple setae; black scalelike setae; and silvery white scalelike setae. **Genitalia:** Figure 64.

Female. Similar to male in color, vestiture, and structure. Length 8.37–9.00, width 2.70–3.02. **Head:** width across eyes 1.31–1.38, vertex 0.48–0.52. **Rostrum:** length 4.37–4.59, reaching base of ovipositor or slightly beyond. **Antennae:** I, 1.87–2.02; II, 4.00–4.21; III, 2.02–2.16; IV, 1.28–1.35. **Pronotum:** mesal length 1.31–1.42, posterior width 2.18–2.41.

ETYMOLOGY: From the Latin, *cortex* (bark) and *-cola* (dweller), referring to the habitat of the species on bark of pine trees.

DISCUSSION: *Phytocoris corticola* has been collected in Arizona, Colorado, Nevada, and Utah. A single specimen also was taken near Santa Fe, New Mexico. The known host plants are *Pinus edulis* Engelm., *P. monophylla* Torr. & Frem., and *P. ponderosa* Dougl. Males and females are attracted to light.

ADDITIONAL SPECIMENS: 20 specimens were examined from the following localities: ARIZONA. **Coconino Co.:** Williams (USNM). COLORADO. **Clear Creek Co.:** 7 mi W Idaho Springs (OSU). **Douglas Co.:** Roxborough Rd. nr. Chatfield Pk. (JTP). NEVADA. **Lander Co.:** Austin Smt. (UCB). NEW MEXICO. **Santa Fe Co.:** 10 mi NE Santa Fe (AMNH). UTAH. **Emery Co.:** 13.2 mi NW St. Hwy.

10 on St. Hwy. 31 (OSU). **Garfield Co.:** Boulder Mt. (USU). **Sevier Co.:** Clear Crk. Narrows Smt. (OSU); 26.6 mi N St. Hwy. 24 on St. Hwy. 72 (OSU); 2.4 mi S Rt. 4 on Kanosh Rd. (AMNH). **Wayne Co.:** 10.5 mi N St. Hwy. 24 on St. Hwy. 72 (OSU); Boulder Mt. (USU). Collection dates are from July 10 to August 17.

Phytocoris fraterculus Van Duzee
Figures 55, 65

Phytocoris fraterculus Van Duzee, 1918: 283, 284.
– Carvalho, 1959: 199. – Knight, 1968: 235, fig. 285.

Phytocoris westwoodi Bliven, 1966: 119, pl. X, figs. 14, 15. NEW SYNONYMY.

TYPES: *Phytocoris fraterculus* was described from 14 specimens collected in Arizona and California. The male holotype (no. 399), allotype (no. 400), and two paratypes were taken at Yosemite, Mariposa Co., California, 16 June 1916, W. M. Giffard. All type material is retained in the Van Duzee Collection (CAS) except two paratypes that are deposited in the Knight Collection (USNM); one paratype was not located.

Four female paratypes in the Van Duzee Collection are not conspecific with the holotype. One specimen collected at Fallen Leaf Lk., 1950 m, Eldorado Co., California, 21 August 1916, W. M. Giffard is correctly identified as *dumicola* and a second specimen with the same data is identified as *californicus*. A third paratype from Bright Angel Camp, 2100 m, Coconino Co., Arizona, H. F. Wickham is conspecific with *heidemanni*. The last specimen from Soda Spgs. Smt., 2012 m, Nevada Co., California, 24 August 1916, W. M. Giffard is identified as *ceanothicus*. In each case, I have added the appropriate determination label to prevent later confusion regarding the correct identity of these specimens.

The junior synonym, *westwoodi*, was described from two specimens collected in northern California by B. P. Bliven. The male holotype was taken at Westwood, Lassen Co., 21 July 1954, on *Pinus*, and the allotype was collected on Van Duzee Rd., Trinity Co., 14 July 1957, on douglas fir. Both specimens are retained in the collection of the CAS (type number 13880). The allotype of *westwoodi* is

not conspecific with the holotype. It is correctly placed in the *conspurcatus* group, but could not be identified to species.

DIAGNOSIS: Length 5.9–7.6. Distinguished from other brown or grayish brown species of the *fraterculus* group by the following combination of characters: length of antennal segment I much greater than width of head across eyes; posterior submargin of pronotal disk with transverse fuscous line, or broadly fuscous; scutellum moderately convex, sloping gradually to apex; pale annuli on front tibiae much narrower than dark annuli; length of right paramere only slightly more than two times greatest width (fig. 65d, e); shaft of left paramere broadly expanded distally (fig. 65c).

DISCUSSION: The distribution of *fraterculus* includes much of the western United States with the exception of the American Desert and Intermountain Sagebrush provinces. This species has not been collected west of the Cascade Range in Washington and Oregon but does occur in the transverse mountain ranges of southwestern Oregon and northern California, as well as the coast ranges of central and southern California. The distribution extends east to the Rocky Mts. and south to the Chiricahua Mts. in Arizona.

Examination of male genital structures revealed several consistent differences between specimens from California, Oregon, and Washington (western populations); and those from Arizona, Colorado, New Mexico, Utah, and Wyoming (eastern populations). Males from the Pacific Coast states have a distinct dorsal knob on the arm of the right paramere (fig. 65d). This knob is very small or absent in specimens from eastern populations (fig. 65e). The sensory lobe of the left paramere is rounded apically in west coast males (fig. 65a) but more truncate in eastern specimens (fig. 65b). Finally, the membranous portion of the vesica is more deeply divided medially in males from eastern populations, and lacks a median, spinose region that is always present in western specimens. The eastern and western populations of *fraterculus* appear to overlap in Idaho and western Montana, but I was unable to determine if the two forms remain distinct in this region. Until more specimens are available for study, I am recognizing the western and eastern populations

as biotypes of a single species. Externally, these biotypes are very similar except that eastern specimens are usually somewhat larger and have a slightly narrower vertex.

Adults have been collected on *Pinus attenuata* Lemmon, *P. contorta* Dougl., *P. flexilis* James., *P. monophylla* Torr. & Frem., and *P. ponderosa* Dougl. I have examined 465 specimens with collection dates from June 9 to October 4.

Phytocoris heidemanni Reuter

Figures 57, 58, 66

Phytocoris heidemanni Reuter, 1909: 27. – Van Duzee, 1917a: 318; 1918: 285. – Carvalho, 1959: 200. – Knight, 1968: 229, figs. 266, 267. – Henry and Stonedahl, 1983: 451, 452.

TYPES: *Phytocoris heidemanni* was described from Pecos, New Mexico, 23 June, O. Heidemann. I have examined a single female from the type locality that bears Reuter's hand-printed determination label. This specimen was designated a lectotype by Henry and Stonedahl (1983) and is deposited in the collection of the USNM.

DIAGNOSIS: Recognized by the large body size, 7.0–9.2; grayish brown general coloration; strongly convex scutellum, abruptly deflexed distally; long first antennal segment; and structure of the male genitalia: genital capsule with weak, ridgelike protuberance above base of left paramere; shaft of left paramere with series of spines basally (fig. 66b), outer distal margin of shaft slightly expanded (fig. 66b); right paramere with weak basal angle (fig. 66c); sclerotized process of vesica nearly spherical basally (fig. 66d). Further distinguished from *praealtus* by the shorter, broader patches of tubercles on the extreme right lobe and left medial lobe of the vesica, and left medial lobe of vesica without apical sleevelike sac.

DISCUSSION: *Phytocoris heidemanni* is widely distributed in Nevada, Utah, Arizona, and the Rocky Mts. from Glacier Co., Montana to Socorro Co., New Mexico. The westernmost records are from Mono and Inyo counties in California, and the southernmost record is from the Chiricahua Mts., Cochise Co., Arizona. Specimens also were examined from Hood River Co., Oregon, Pennington

Co., South Dakota, and Crook Co., Wyoming. Adults have been collected on the following host plants: *Pinus albicaulis* Englem., *P. contorta* Dougl., *P. edulis* Engelm., *P. monophylla* Torr. & Frem., and *P. ponderosa* Dougl. Several specimens also were taken in Wasatch Co., Utah, on *Picea engelmannii* Parry. Males and females are attracted to light. I have examined 155 specimens with collection dates from June 11 to September 5.

Phytocoris inops Uhler

Figure 67

- Phytocoris inops* Uhler, 1877: 413; 1878: 402; 1895: 33 (as *Neurocolpus inops*). – Van Duzee, 1917a: 317; 1918: 285; 1923: 147. – Carvalho, 1959: 202. – Henry and Stonedahl, 1983: 452–454.
- Phytocoris annulicornis*: Van Duzee, 1908: 113 (misident.).
- Phytocoris palmeri* Reuter, 1909: 32. – Van Duzee, 1917a: 318. – Knight, 1923: 621, fig. 134. – Blatchley, 1926: 705. – Carvalho, 1959: 209. – Henry and Stonedahl, 1983: 453 (syn.).
- Phytocoris vittatus* Reuter, 1909: 28, 29. – Van Duzee, 1917a: 318. – Knight, 1923: 627, 628. – Blatchley, 1926: 708. – Knight, 1941: 190. – Carvalho, 1959: 221. – Henry and Stonedahl, 1983: 453 (syn.).
- Phytocoris hesperius* Knight, 1928: 44, 45. – Carvalho, 1959: 201. – Knight, 1968: 229, fig. 263. – Henry and Stonedahl, 1983: 453 (syn.).
- Phytocoris hesperellus* Knight, 1968: 232, fig. 264. – Henry and Stonedahl, 1983: 453 (syn.).

TYPES: The name *Phytocoris inops* was used in two separate descriptions by Uhler (1877, 1878), and as noted by Henry and Stonedahl (1983: 447, 453), the descriptions are based on different species. The original description was clearly based on a series of specimens, probably representing more than one species. Only a single female with label data, "Clear Cr. Canon" could be associated with Uhler's (1877) description. This specimen was designated a lectotype by Henry and Stonedahl (1983) and is deposited in the USNM. *Phytocoris inops* Uhler (1878) is a junior primary homonym of *inops* Uhler (1877). As recognized by Henry and Stonedahl (1983), the next available name for *inops* Uhler (1878) is *Phytocoris canadensis* Van Duzee. This species is distributed in eastern Canada and the northeastern and midwestern United States.

The junior synonym, *palmeri*, was described from an undesignated number of specimens collected at Quinze Lk., Quebec, Canada, 14 August 1907, W. J. Palmer. I have examined two specimens from the type series; a male specimen (no. 1994), retained in the collection of the CAS, and one female specimen deposited in the USNM. The male was designated a lectotype by Henry and Stonedahl (1983).

A single female of the junior synonym, *vittatus*, was discovered in the collection of the USNM; label data: Lake Placid, NY., 8-12-04; Van Duzee Collector; *Phytocoris vittatus* n.sp., O. M. Reuter det. Knight (1923: 628) referred to this specimen as the type of the species but no type label accompanies the specimen. Since Reuter (1909) did not indicate whether this was the only specimen on which he based the original description, it was designated a lectotype by Henry and Stonedahl (1983) and is retained in the collection of the USNM.

The junior synonym, *hesperius*, was described from 28 specimens collected in Arizona, Colorado, Oregon, New Mexico, and Wyoming. The male holotype and a single male paratype were taken at Stonewall, 2590 m, Las Animas Co., Colorado, 7 August 1925, H. H. Knight, ex. *Cercocarpus betuloides* Nutt. All type material is retained in the Knight Collection (USNM) except two male paratypes deposited in the collection of the UAZ; 11 paratypes were not located.

The male holotype of the junior synonym, *hesperellus*, was collected at Salt Lk. City, Salt Lk. Co., Utah, 1 July 1955, H. B. Stafford. The allotype was taken in Area 17M, Nevada Test Site, Nye Co., Nevada, 16 June 1965, H. H. Knight and J. M. Merino. Both specimens are retained in the Knight collection (USNM).

DIAGNOSIS: Length 5.6–8.1. Externally, *inops* closely resembles *schuhi* but is distinguished by the following characters: lateral margins of pronotal disk broadly infuscated; pale annuli on front tibiae much narrower than dark annuli; veins of hemelytral membrane tinged with red; and structure of the male genitalia (fig. 67).

DISCUSSION: *Phytocoris inops* is widely distributed in western North America, predom-

inantly in mountainous regions. I have examined specimens from British Columbia, Canada, and all western states except Montana. In the Cascade Range the distribution extends south to Siskiyou Co., California. The southernmost record in the Rocky Mts. is Tajique, Torrance Co., New Mexico. This species also is widely distributed in the central and southeastern mountain ranges of Arizona, east through southern New Mexico to Frio Co., Texas. Adult specimens have been collected from the following host plants: *Amelanchier utahensis* Koehne, *Cercocarpus betuloides* Nutt., *C. breviflorus* A. Gray, *C. ledifolius* Nutt., *C. montanus* Raf., *Crataegus douglasii* Lindl., *Fallugia paradoxa* (D. Don) Endl., *Holodiscus discolor* (Pursh) Maxim., *Lycium pallidum* Miers, *Quercus* spp., *Rhamnus crocea* Nutt., *Rhus trilobata* Nutt., *Ribes* sp., *Shepherdia argentea* (Pursh) Nutt., *S. canadensis* (L.) Nutt., *Symphoricarpos longiflorus* A. Gray, *S. oreophilus* A. Gray. Both sexes have been collected at light. I have examined several hundred specimens with collection dates from June 1 to October 5.

Phytocoris inops also occurs in eastern North America, but is known only from type material collected in Quebec and New York. Knight (1941) reports this species from New York on *Ribes cynosbati* L. The absence of further records from eastern North America seems to be the result of confusion as to the identity of *inops* Uhler (1878) (= *canadensis* Van D.), *palmeri*, and *vittatus*. Thus, *inops* Uhler (1877) was repeatedly misidentified by early workers as were its junior synonyms, *palmeri* and *vittatus*. I expect that further collecting and careful examination of museum specimens will yield additional records for this species in northeastern North America.

Phytocoris inops is extremely variable in size, body proportions, and extent of dark markings on the dorsum. This variability has prompted descriptions of several species that are conspecific with *inops* (i.e., *hesperellus*, *hesperius*, *palmeri*, *vittatus*). Although variable in external appearance, *inops* is readily identified by the structure of the male genitalia (fig. 67). This species does not inhabit coniferous host plants, but is placed in the *fraterculus* group based on features of the male genitalia.

Phytocoris jucundus Van Duzee

Figure 68

Phytocoris jucundus Van Duzee, 1914: 17, 18; 1917a: 319; 1917b: 262. – Carvalho, 1959: 203. – Knight, 1968: 226. – Henry and Stonedahl, 1983: 454, 455.

TYPES: *Phytocoris jucundus* was described from an undesignated number of specimens collected on "pine trees" at Pine Hills, Cuyamaca Mts., 1280 m, San Diego Co., California, 19 October 1913, E. P. Van Duzee. Eight specimens of the original syntype series are retained in the Van Duzee Collection (CAS) and one female specimen is deposited in the collection of the USNM. Following the original description, Van Duzee selected a lectotype (no. 1998) and "allotype" (no. 1999) for *jucundus*, but no record of the type designation was ever published. He tagged the remaining specimens of the syntype series with orange "paratype" labels. The male specimen selected as a lectotype by Van Duzee is designated as such by Henry and Stonedahl (1983) and is deposited in the collection of the CAS.

DIAGNOSIS: Length 5.5–6.8. Similar to *cochise* but without black scalelike setae on the pronotal disk, outer margin of corium, and cuneus; shaft of left paramere slightly expanded medially (fig. 68b); and arm of right paramere with prominent knoblike process dorsally (fig. 68c). *Phytocoris jucundus* is distinguished from *auranti* and *mirus* by the short first antennal segment; ratio of segment length to width of head across eyes less than or equal to 1.05:1 for males and 1.20:1 for females.

DISCUSSION: *Phytocoris jucundus* is distributed throughout much of California and Oregon, and also is known from several localities in western Idaho and southern Washington. Specimens have been collected as far north as Pierce Co., Washington; east to Latah Co., Idaho; and south to the Cuyamaca Mts., San Diego Co., California. In Oregon, this species is not known to occur west of the Cascade Range except in the Siskiyou Mts. and an apparently isolated population near Winkle Lk. in Benton County. The coast ranges form the western boundary of the distribution in California. Adults have

been collected on *Pinus attenuata* Lemmon, *P. contorta* Dougl., and *P. ponderosa* Dougl. I have examined 185 specimens with collection dates from July 25 to October 19.

***Phytocoris kuschei*, new species**

Figure 69

HOLOTYPE MALE: Turkey Flat, Chiricahua Mts., 8000–9000 ft (2440–2745 m), Cochise Co., Arizona, 22 July 1927, J. A. Kusche (CAS).

PARATYPES: ARIZONA. Cochise Co.: Chiricahua Mts.: 2 males, same data as holotype (AMNH, CAS); 1 male, Bar Foot Ridge, 2440 m, 29 July 1927, J. A. Kusche (CAS); 1 male, 5 July 1940, D. E. Hardy (KU); 3 males, 1890 m, 20 June 1928, A. A. Nichol (USNM); 2 females, Chiricahua Nat. Mon., 24 August 1935, R. H. Beamer (KU). 1 female, Huachuca Mt., 18 July 1938, R. H. Beamer (KU).

DIAGNOSIS: Recognized by the reddish brown general coloration; short first antennal segment—length not or only slightly exceeding width of head across eyes; second antennal segment brown or yellowish brown, without pale median annulus; posterior submargin of pronotal disk darkened; veins of hemelytral membrane dark red; and structure of the male genitalia, especially the large, angulate swelling on left distal margin of genital capsule above paramere base, and membranous lobes of vesica with patches of very stout tubercles. Parameres and sclerotized process of vesica as in figure 69.

DESCRIPTION: *Male.* Length 6.05–6.95, width 1.97–2.25; orange brown or pale reddish brown general coloration. **Head:** width across eyes 1.13–1.18, vertex 0.30–0.32; pale yellow or brownish yellow with red or brownish red markings. **Rostrum:** length 2.85–3.05, reaching fourth or fifth abdominal segment. **Antennae:** I, length 1.09–1.15, dark reddish brown with pale maculae dorsally and laterally; II, length 2.65–2.95, yellowish brown, sometimes slightly darker distally, basal half sometimes lightly tinged with red; III, length 1.36–1.48, brown or yellowish brown; IV, length 0.96–0.98, brown or yellowish brown. **Pronotum:** mesal length 0.88–1.01, posterior width 1.67–1.78; disk brownish yellow, sometimes lightly tinged with red, posterior

submargin and sometimes lateral margins darker brown, extreme posterior margin narrowly pale; collar and calli marked with red or reddish brown; propleura brown, sometimes tinged with red medially, apical third pale. **Scutellum:** pale brownish yellow with reddish brown or fuscous markings mostly medially and distolaterally, anterior margin sometimes tinged with red. **Hemelytra:** grayish yellow, clavus and corium broadly suffused with brown, veins tinged with red; cuneus, especially distally, with deep reddish tinge; membrane mottled with fuscous, veins dark red. **Legs:** femora pale grayish yellow, distal two-thirds to three-fourths with dense reticulate pattern of red or reddish brown; hind femora extensively darkened anterodistally and marked with pale spots; tibiae pale with reddish brown or fuscous markings; fore tibiae with three pale annuli, basal band sometimes obscured. **Vestiture:** as noted in group description, including scattered dark scalelike setae. **Genitalia:** Figure 69.

Female. Similar to male in color, vestiture, and structure. Length 6.05–6.55, width 2.06–2.12. **Head:** width across eyes 1.06–1.12, vertex 0.40–0.42. **Rostrum:** length 2.75–3.00, reaching near base of ovipositor. **Antennae:** I, 1.12–1.27; II, 2.85–3.00; III, 1.52; IV, missing. **Pronotum:** mesal length 0.92–0.99, posterior width 1.62–1.84.

ETYMOLOGY: Named for J. A. Kusche.

DISCUSSION: *Phytocoris kuschei* is known from the Chiricahua and Huachuca Mts. of southeastern Arizona. The host plant association is not known, but I would look for this species on pine or possibly spruce.

***Phytocoris mellarius* Knight**

Figures 56, 70

Phytocoris mellarius Knight, 1925a: 56, 57. – Carvalho, 1959: 205. – Knight, 1968: 225, fig. 265.

TYPES: *Phytocoris mellarius* was described from 11 specimens collected at Grand View, Grand Canyon, Arizona, 3 August 1917, H. H. Knight. The male holotype, allotype, and five female paratypes are retained in the Knight Collection (USNM). A pair is deposited in the Van Duzee Collection (CAS) and a single female in the collection at UAZ. One male paratype was not located.

Five additional specimens labeled as paratypes were discovered in the Knight Collection (USNM) that were not listed in the original description; label data: Grand Canyon, Ariz., 40 mi south, Aug. 3, 1917, H. H. Knight; on *Pinus* (in part).

DIAGNOSIS: Length 5.0–6.0. Similar to *chiuhahuanae* and *simulatus* but distinguished by the stramineous general coloration with light brown markings; vestiture of dorsum entirely pale, hemelytra rarely with scattered dark scalelike setae; posterior submargin of pronotal disk without fuscous markings; and sclerotized process of vesica long and narrow (fig. 70d).

DISCUSSION: This species is distributed in southern Nevada, Utah, western Colorado, and Arizona on pinyon pine. Specimens also have been collected in Kern, Inyo, Mono, Riverside, and San Bernardino counties in California. The northernmost records are from Churchill and White Pine counties, Nevada, and Duchesne and Uintah counties, Utah. The southernmost record is from Cochise Co., Arizona. Adults and nymphs have been taken on *Pinus edulis* Engelm. and *P. monophylla* Torr. & Frem. I have examined 350 specimens with collection dates from May 21 to October 7.

Phytocoris mirus Knight

Figure 71

Phytocoris mirus Knight, 1928: 35, 36. – Carvalho, 1959: 207. – Knight, 1968: 235.

TYPES: Described from six specimens collected in Arizona and Colorado. The male holotype, allotype, and a single male paratype were taken at Stonewall, 2590 m, Las Animas Co., Colorado, 7 August 1925, H. H. Knight, ex. *Picea* sp. All type material is retained in the Knight Collection (USNM); two paratypes were not located.

DIAGNOSIS: Length 6.0–7.0. *Phytocoris mirus* is very similar to *auranti*, but is distinguished by the following genitalic characters: sensory lobe of left paramere strongly produced, narrowly rounded apically (fig. 71a); shaft of left paramere short, broadly expanded distally (fig. 71b); and arm of right paramere without knoblike dorsal process (fig. 71c). The long first antennal segment will dis-

tinguish *mirus* from *cochise* and *jucundus* (see couplet 14 in key).

DISCUSSION: *Phytocoris mirus* is distributed in mountainous regions of Arizona, Colorado, New Mexico, and Utah. Specimens have been collected as far north as Boulder Co., Colorado and Cache Co., Utah, and south to the Chiricahua Mts. in Arizona and the Pinos Altos Range in Grant Co., New Mexico. Adults have been taken on *Picea engelmannii* Parry and *Pseudotsuga menziesii* (Mirb.) Franco. I have examined 28 specimens with collection dates from July 10 to August 31.

Phytocoris piceicola Knight

Figure 72

Phytocoris piceicola Knight, 1928: 32, 33. – Carvalho, 1959: 210. – Knight, 1968: 229, fig. 283.

TYPES: The male holotype, allotype, and 12 male paratypes were collected at Stonewall, 2590 m, Las Animas Co., Colorado, 7 August 1925, H. H. Knight, ex. *Picea* sp. Seven additional paratypes were collected in Arizona. All type material is retained in the Knight Collection (USNM); 11 paratypes were not located.

DIAGNOSIS: Length 6.1–7.2. Similar to *fraterculus* but distinguished by the paler grayish yellow general coloration, dorsum lightly marked with brown; antennal segment two yellowish brown; veins of hemelytral membrane tinged with red; pale annuli on front tibiae about as broad as dark annuli; shaft of left paramere not expanded distally (fig. 72b); and sclerotized process of vesica smaller, not as strongly curved distally (fig. 72d).

DISCUSSION: Twenty-three additional specimens of *piceicola* were examined from the following localities: ARIZONA. **Cochise Co.:** Deer Park, Chiricahua Mts., 2440 m (CAS); Huachuca Mts. (USNM). **Pima Co.:** Mt. Lemon (paratype, USNM). COLORADO. **Douglas Co.:** Sedalia (JTP). **Jefferson Co.:** Deer Creek Cyn. (JTP). **Las Animas Co.:** Stonewall, 2745 m (JTP). NEW MEXICO. **Colfax Co.:** 5 mi E Eagle's Nest (SHF). **Dona Ana Co.:** Las Cruces (KU). **Sandoval Co.:** Jemez Mts., 10 mi W Los Alamos (JTP); 7 mi W Los Alamos (JTP). UTAH. **Garfield Co.:** Bryce Cyn. (CAS). The only host plant record

for *piceicola* is *Picea* sp. The period of occurrence is from July 1 to August 25.

Phytocoris politus Reuter

Figure 73

Phytocoris politus Reuter, 1909: 21. – Van Duzee, 1917a: 320. – Carvalho, 1959: 211. – Knight, 1968: 225, fig. 269. – Henry and Stonedahl, 1983: 457, 458.

Phytocoris rusticus Van Duzee, 1920: 348, 349. – Carvalho, 1959: 215. – Henry and Stonedahl, 1983: 458 (syn.).

TYPES: *Phytocoris politus* was described from an undesignated number of specimens collected in Ormsby County, Nevada. I have examined two specimens of the type series from the collection of the Zoological Museum, Helsinki, and two specimens from the Knight Collection (USNM). A male specimen from the ZMH was designated a lectotype by Henry and Stonedahl (1983).

The junior synonym, *rusticus*, was described from 10 specimens collected in southern Oregon and northern California. The male holotype and one male paratype were taken at Mt. St. Helena, Napa Co., California, 9 June 1918, E. P. Van Duzee. The holotype (no. 699) allotype (no. 700), and six paratypes are retained in the Van Duzee Collection (CAS); two paratypes are deposited in the Knight Collection (USNM).

DIAGNOSIS: Length 5.4–6.8. *Phytocoris politus* is distinguished from other species of the *fraterculus* group by the dark reddish brown coloration, fuscous band on the posterior submargin of the pronotal disk, absence of pale annuli on the front tibiae, and structure of the male genitalia (fig. 73).

DISCUSSION: *Phytocoris politus* is distributed from southern California to British Columbia, Canada, and east to Washoe Co., Nevada, and western Idaho. The northernmost and southernmost records are from the San Jacinto Mts., California and Lk. Skaha, British Columbia. This species does not occur west of the Cascade Range except in the Siskiyou Mts. of southern Oregon. The coast ranges form the western boundary of the distribution in California. Adults have been collected on *Pinus attenuata* Lemmon, *P. jeffreyi* Grev. & Balf., and *P. ponderosa* Dougl. I have examined several hundred specimens with collection dates from June 7 to October 18.

Phytocoris praealtus, new species

Figure 74

HOLOTYPE MALE: Deer Park, Chiricahua Mts., 9000–9800 ft (2745–2990 m), Cochise Co., Arizona, 30 July 1927, J. A. Kusche (CAS).

PARATYPES: ARIZONA. Cochise Co.: Chiricahua Mts.: 4 males, same data as holotype (CAS); 1 female, same data as holotype except 2440 m, 7 July 1927 (CAS); 3 males, Rustler Pk., 2440–2745 m, 26 July 1927, J. A. Kusche (AMNH, CAS); 2 males, Rustler Pk., 2590 m, 2 August 1973, at light, J. Powell and S. Szerlip (UCB); 4 males, Turkey Flat, 2440 m, 22 July 1927, J. A. Kusche (AMNH, CAS).

DIAGNOSIS: Similar to *commissuralis* and *heidemanni* in external appearance but distinguished by the shape of the sclerotized process of the vesica (fig. 74d); right paramere with strong ventral angle (fig. 74c); shaft of left paramere not expanded on outer distal margin (fig. 74b); genital capsule without weak ridgelike protuberance above base of left paramere; apex of left medial lobe of vesica produced as narrow, sleeve-like sac; patches of tubercles on extreme right lobe and left medial lobe of vesica more elongate; and extreme left lobe of vesica with larger patch of broadly distributed tubercles. Distinguished from other species of the *fraterculus* group by the large size, dark brown general coloration, long first antennal segment, greatly inflated scutellum, and structure of the male genitalia.

DESCRIPTION: *Male.* Length 8.08–9.00, width 2.55–2.85; dark brown general coloration. **Head:** width across eyes 1.28–1.39, vertex 0.42–0.47; grayish white or brownish yellow ground color with extensive brown or dark reddish brown markings. **Rostrum:** length 3.50–3.65, reaching fourth or fifth abdominal segment. **Antennae:** brown or dark brown; segment I with pale maculae dorsally and laterally; segment II with pale region medially; length of segment I, 1.61–1.93; II, 3.34–4.20; III, 1.66–1.88; IV, 1.16–1.22. **Pronotum:** mesal length 1.08–1.26, posterior width 1.96–2.20; disk mostly brown, posterior submargin with darker fuscous line, extreme posterior margin narrowly pale; collar and calli extensively darkened with brown or reddish brown; propleura fuscous, apical third

pale. **Scutellum:** greatly inflated, strongly deflexed distally and sloping steeply to apex; mostly pale or extensively darkened with brown or dark brown, ovoid spot in middle of deflexed region always pale. **Hemelytra:** grayish yellow ground color, extensively darkened with brown or dark brown; posteromedial region of corium and bordering margin of cuneus lighter yellowish gray; membrane conspurcate, veins fuscous, sometimes tinged with red. **Legs:** femora dark brown with pale spots; tibiae extensively darkened with brown or fuscous; fore tibiae with three pale annuli, these narrower than intervening dark bands. **Vestiture:** as noted in group description, including dark scalelike setae. **Genitalia:** Figure 74.

Female. Similar to male in color, vestiture, and structure. Length 8.45, width 2.78. **Head:** width across eyes 1.34, vertex 0.49. **Rostrum:** broken. **Antennae:** I, 2.00; II, 4.20; III, 1.92; IV, 1.17. **Pronotum:** mesal length 1.18, posterior width 2.05. The female measurements were taken from the single specimen collected at the type locality.

ETYMOLOGY: From the Latin, *praealtus* (very high), referring to the high elevations (2440–2990 m) from which the species is known.

DISCUSSION: *Phytocoris praealtus* is known only from the type material collected in the Chiricahua Mts. of Arizona. The host plant association is not known, but I would speculate that this species occurs on one of the *Pinus* species that grows at high elevations in southeastern Arizona.

Phytocoris schuhi, new species

Figure 75

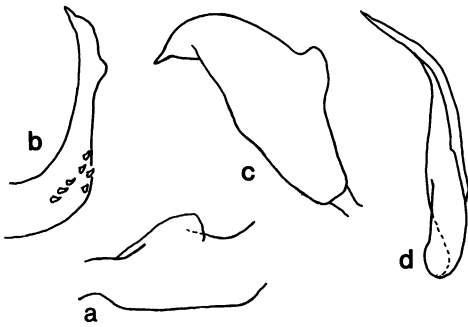
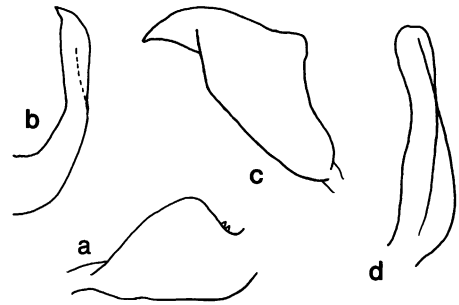
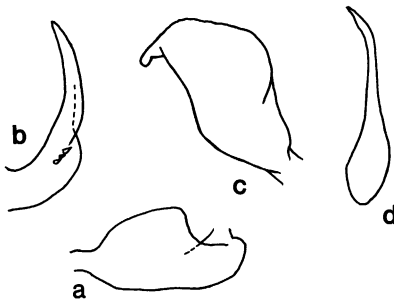
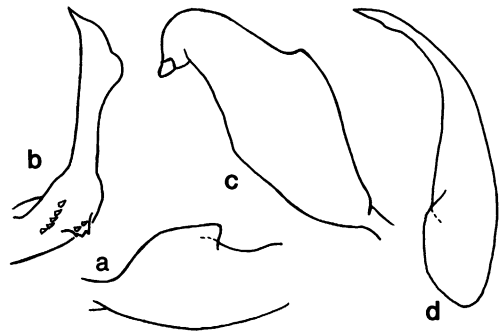
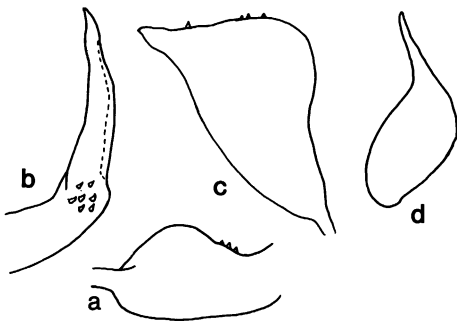
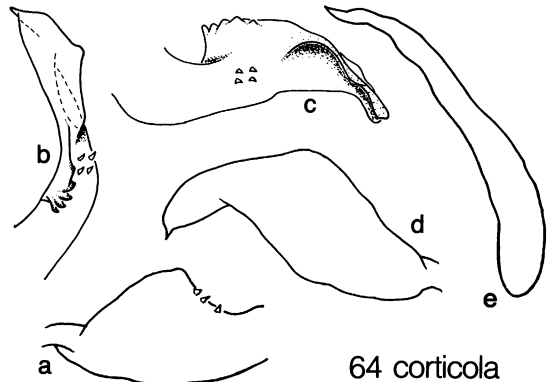
HOLOTYPE MALE: Clear Crk. Narrows Smt. on Interstate Hwy. 70, 2188–2244 m, Sevier Co., Utah, 15 July 1980, ex. *Juniperus* sp., R. T. Schuh and G. M. Stonedahl (AMNH).

PARATYPES: NEVADA. **White Pine Co.:** 5 males, 2 females, Little Antelope Summit on Rt. 50, 2270 m, 19 July 1986, ex. *Juniperus* sp., R. T. Schuh (AMNH). **UTAH.** **Emery Co.:** 7 males, 3 females, 13.2 mi NW Jct. of St. Hwy. 10 on St. Hwy. 31, 2180 m, 17 July 1980, ex. *Juniperus* sp., G. M. Stonedahl (OSU). **Garfield Co.:** 1 male, Mt. Hillers at Starr Springs Cmpgd., T34S R11E, 1920 m,

18 June 1983, ex. *Juniperus osteosperma* (Torr.) Little, R. T. Schuh and M. D. Schwartz (AMNH). **Sanpete Co.:** 1 male, Cottonwood Crk., 2.1 mi NE Fairview on Rt. 31, T31S R5E, 2060 m, 12 July 1981, ex. *Juniperus osteosperma*, M. D. Schwartz (AMNH). **Sevier Co.:** 5 males, 7 females, same data as holotype (AMNH, OSU). **WYOMING.** **Freemont Co.:** 12 males, 27 females, Sink Cyn. Cmpgd. on Rt. 131, Wind R. Mts., 14 August 1986, ex. *Juniperus osteosperma*, M. D. Schwartz and G. M. Stonedahl (AMNH).

DIAGNOSIS: Distinguished from other species of the *fraterculus* group by the following combination of characters: posterior submargin of pronotal disk with wavy, fuscous line; ratio of length of first antennal segment to width of head across eyes greater than 1.10:1; right paramere at least three times as long as greatest width (fig. 75c); and shaft of left paramere greatly expanded distally (fig. 75b). *Phytocoris schuhi* closely resembles *inops* but is distinguished by the broader pale annuli on the front tibiae, absence of red markings on veins of hemelytral, membrane and by the structure of the male genitalia (fig. 75).

DESCRIPTION: **Male.** Length 5.94–7.07, width 1.76–2.05; gray general coloration with brown to fuscous markings. **Head:** width across eyes 1.02–1.11, vertex 0.32–0.33; frons with 6–8 reddish brown striae. **Rostrum:** length 2.68–2.92, reaching sixth or seventh abdominal segment. **Antennae:** brown to fuscous; I, length 1.21–1.42, dorsal surface with large white patches; II, length 2.79–3.29; III, length 1.26–1.44; IV, length 0.90–1.02. **Pronotum:** mesal length 0.79–0.96, posterior width 1.40–1.55; disk brownish gray, posterior submargin with wavy fuscous line and 4–6 weakly elevated points; collar and calli grayish yellow with reddish brown markings; propleura fuscous, apical third pale. **Scutellum:** pale gray with fuscous spot either side before apex. **Hemelytra:** pale gray with limited brown to fuscous markings particularly along claval, cubital, and radial veins; membrane lightly to moderately conspurcate, veins pale except radius fuscous. **Legs:** femora white or pale yellow, extensively darkened with fuscous particularly on apical half; dorsal surface of hind femora with large, uniformly fuscous region; dark regions on femora broken by pale spots; tibiae pale with dark markings, front

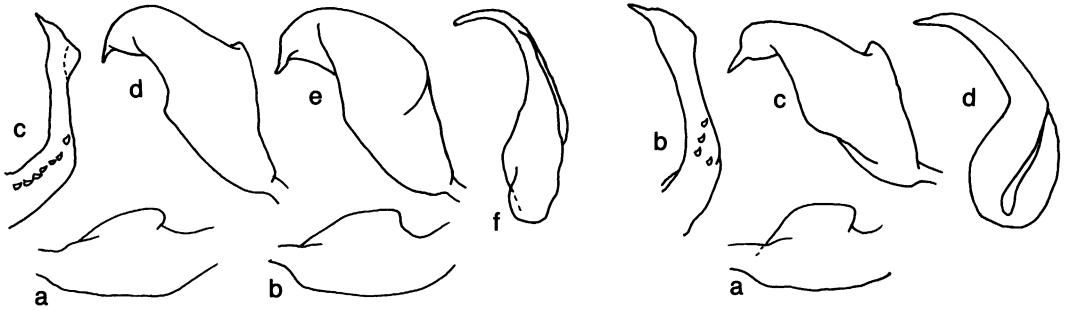
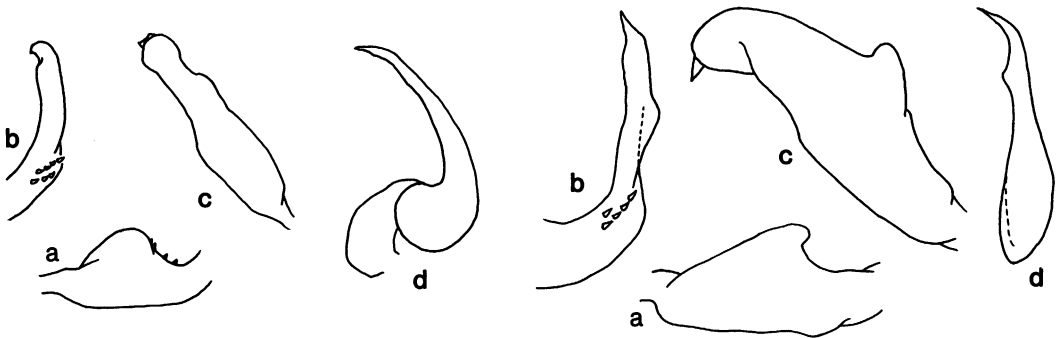
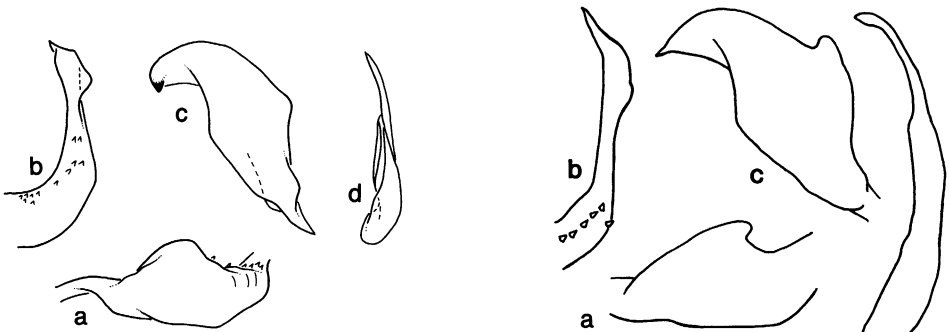
59 *auranti*60 *chihuahaunae*61 *cochise*62 *commissuralis*63 *comulus*64 *corticola*

Figs. 59–64. Male genitalia of *fraterculus* group species. 59–63. a. Arm of left clasper, lateral view. b. Shaft of left clasper, dorsal view. c. Right clasper, lateral view. d. Sclerotized process of vesica. 64. a. Arm of left clasper, lateral view. b, c. Shaft of left clasper. b. Dorsal view. c. Lateral view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

tibiae with alternating light and dark annuli. **Vestiture:** dorsum with long, dark, simple setae; black scalelike setae; and silvery white scalelike setae. **Genitalia:** Figure 75.

Female. Similar to male in color, vestiture, and structure. Length 5.89–6.97, width 1.89–

2.16. **Head:** width across eyes 1.02–1.05, vertex 0.42–0.45. **Rostrum:** length 2.75–3.08, reaching fifth or sixth abdominal segment. **Antennae:** I, 1.40–1.62; II, 3.04–3.51; III, 1.44–1.62; IV, 0.86–1.04. **Pronotum:** mesal length 0.76–0.92, posterior width 1.40–1.58.

65 *fraterculus*66 *heidemanni*67 *inops*68 *jucundus*69 *kuschei*70 *mellarius*

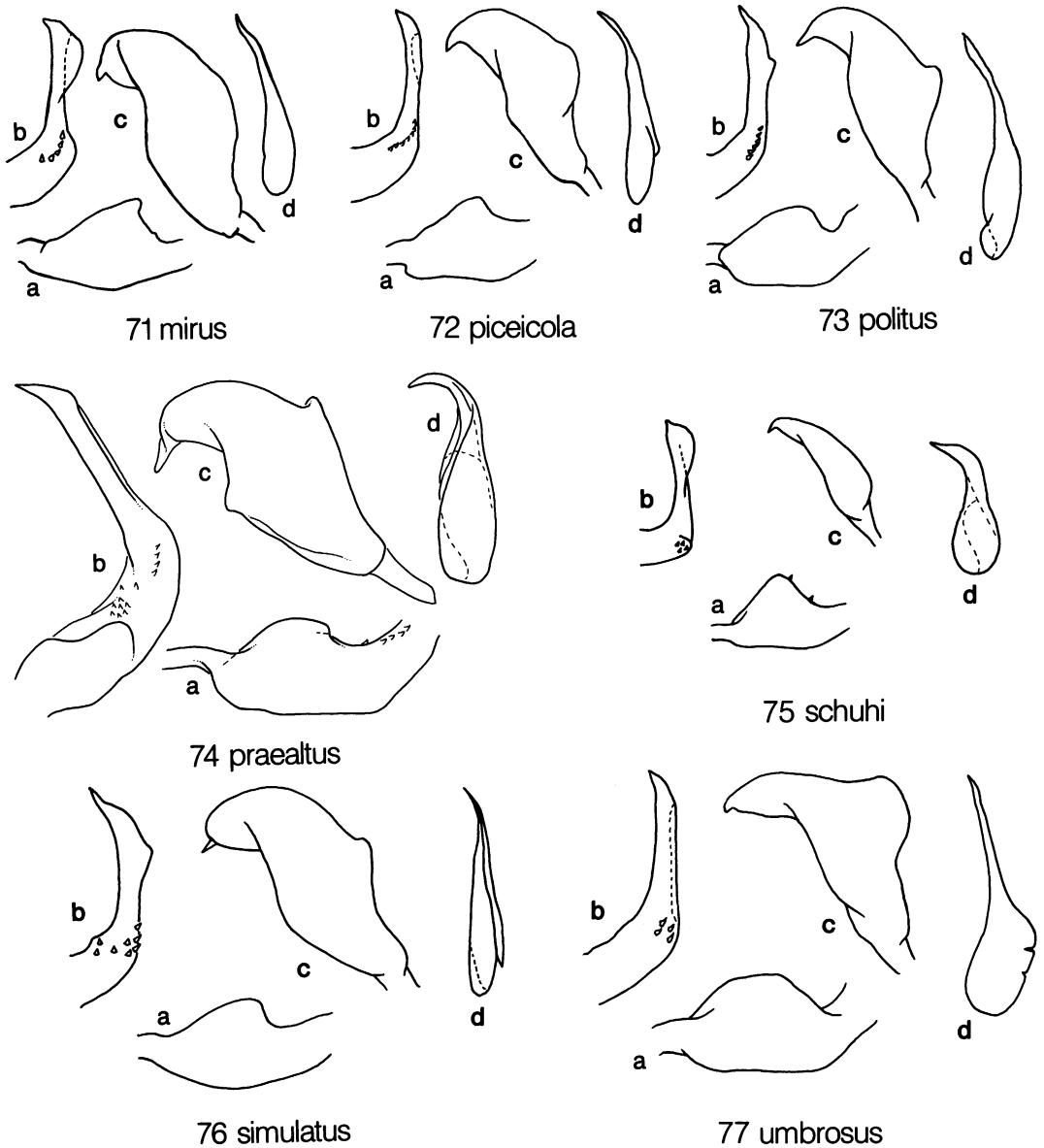
Figs. 65–70. Male genitalia of *fraterculus* group species. 65. a, b. Arm of left clasper, lateral view. a. western population. b. eastern population. c. Shaft of left clasper, dorsal view (western population). d, e. Right clasper, lateral view. d. western population. e. eastern population. f. Sclerotized process of vesica (western population). 66–70. a. Arm of left clasper, lateral view. b. Shaft of left clasper, dorsal view. c. Right clasper, lateral view. d. Sclerotized process of vesica.

ETYMOLOGY: Named for Randall T. Schuh, Curator of Heteroptera, American Museum of Natural History, New York.

DISCUSSION: *Phytocoris schuhi* is broadly distributed in the western United States.

Specimens have been collected in Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming. Most of the material examined was collected on juniper.

ADDITIONAL SPECIMENS: 17 specimens were



Figs. 71–77. Male genitalia of *fraterculus* group species. a. Arm of left clasper, lateral view. b. Shaft of left clasper, dorsal view. c. Right clasper, lateral view. d. Sclerotized process of vesica.

examined from the following localities: ARIZONA. Cochise Co.: 5 mi W Portal, 1646 m (AMNH). COLORADO. Larimer Co.: Rist Canyon, Ft. Collins (USNM). Unspecified Co.: Royal Gorge (KU). NEVADA. White Pine Co.: Little Antelope Smt. on U.S. Hwy. 50, 2270 m (OSU). NEW MEXICO. Torrance Co.: Tajique (KU). The period of occurrence is from May 15 to August 11.

Phytocoris simulatus Knight

Figure 76

Phytocoris simulatus Knight, 1928: 34, 35. – Carvalho, 1959: 216. – Knight, 1968: 225, fig. 268.

TYPES: This species was described from 24 specimens taken in southern Colorado and northern New Mexico. The male holotype, allotype, and 15 paratypes were collected at

Ft. Garland, Costilla Co., Colorado, 10 August 1925, H. H. Knight, ex. *Pinus edulis* Engelm. Two specimens with paratype labels and the following label data were omitted from the original description: Br't Angel, 12-7, Ar., H. S. Barber Collector; Las Vegas HS, 5-8, NM, H. S. Barber Collector. Upon examination, the latter specimen was found to be conspecific with the related species, *mellarius*. All type material is retained in the Knight Collection (USNM); three paratypes were not located.

DIAGNOSIS: Length 4.8–6.1. Similar to *chi-huahuanæ* but distinguished by the larger average body size; cuneus not or only lightly tinged with red; sensory lobe of left paramere less prominent, shaft more abruptly expanded distally (fig. 76a, b); and sclerotized process of vesica bulbous basally, tapering distally to acute apex (fig. 76d). *Phytocoris simulatus* also resembles *mellarius* but differs by the fuscous line on the posterior submargin of the pronotal disk, dark scalelike setae on the hemelytra, darker markings on the legs, and structure of the male genitalia.

DISCUSSION: *Phytocoris simulatus* is distributed in Colorado, New Mexico, eastern Utah, southeastern Arizona, and western Texas. Specimens have been collected as far west as Wayne Co., Utah and Pima Co., Arizona; south and east to Jeff Davis and Brewster counties, Texas; and north to Buena Vista, Caffe Co., Colorado. Adults have been collected on *Pinus edulis* Engelm. and *P. cembroides* Zucc. The period of occurrence is from June 15 to September 16.

Phytocoris umbrosus Knight
Figure 77

Phytocoris umbrosus Knight, 1928: 37, 38. – Carvalho, 1959: 219. – Knight, 1968: 225.

TYPES: The male holotype, allotype, and four paratypes were collected at Stonewall, 2590 m, Las Animas Co., Colorado, 7 August 1925, H. H. Knight, ex. *Pinus ponderosa* Dougl. Eight additional paratypes were collected in Arizona and New Mexico. One female specimen with a paratype label and the following label data was omitted from the original description: Las Vegas HS, 11-8, NM; H. S. Barber Collector. All type material is retained in the Knight Collection (USNM); seven paratypes were not located.

DIAGNOSIS: Similar to *politus* in size, 4.6–6.8, and general coloration, but distinguished by the pale median annulus on the second antennal segment, front tibiae with distinct pale annuli, and arm of right paramere without dorsal knoblike process (fig. 77c).

DISCUSSION: *Phytocoris umbrosus* is distributed in Colorado, New Mexico, and Arizona where it occurs on *Pinus ponderosa* Dougl. Specimens have been collected as far north and east as Estes Park, Larimer Co., Colorado; south to the Huachuca Mts., Cochise Co., Arizona; and west to Williams, Coconino Co., Arizona. I have examined 72 specimens with collection dates from July 7 to August 22. Males have been taken at light.

HOPÍ SPECIES-GROUP

DIAGNOSIS: Recognized by the brown or grayish brown general coloration; quadrate to slightly elongate head with prominent tylus, and frons strongly deflexed apically (fig. 79); small, obovate eyes; long first antennal segment; dorsum with narrow, black scalelike setae and silvery white, sericeous setae (fig. 80); strongly brachypterous female (fig. 78b); and structure of the male genitalia, especially the reduced primary membranous sac of the vesica with one or two large, sickle- or trough-shaped sclerotized processes, and genital capsule, except *brevisetosus*, with well developed tubercle above base of left paramere.

DESCRIPTION: Moderate to large, 5.2–8.6, brown or grayish brown species; females strongly brachypterous; vestiture of dorsum with short, dark, simple setae, silvery white, sericeous setae and narrow, black scalelike setae. **Head:** quadrate to slightly elongate, with strongly convex frons, prominent tylus, and broadly developed gena and gula; antennae yellowish brown to fuscous; length of segment I equal to or greater than posterior width of pronotum, dorsal surface with scattered pale spots; segment II with pale, median annulus; frons abruptly deflexed apically, meeting tylus along deep depression; eyes obovate,

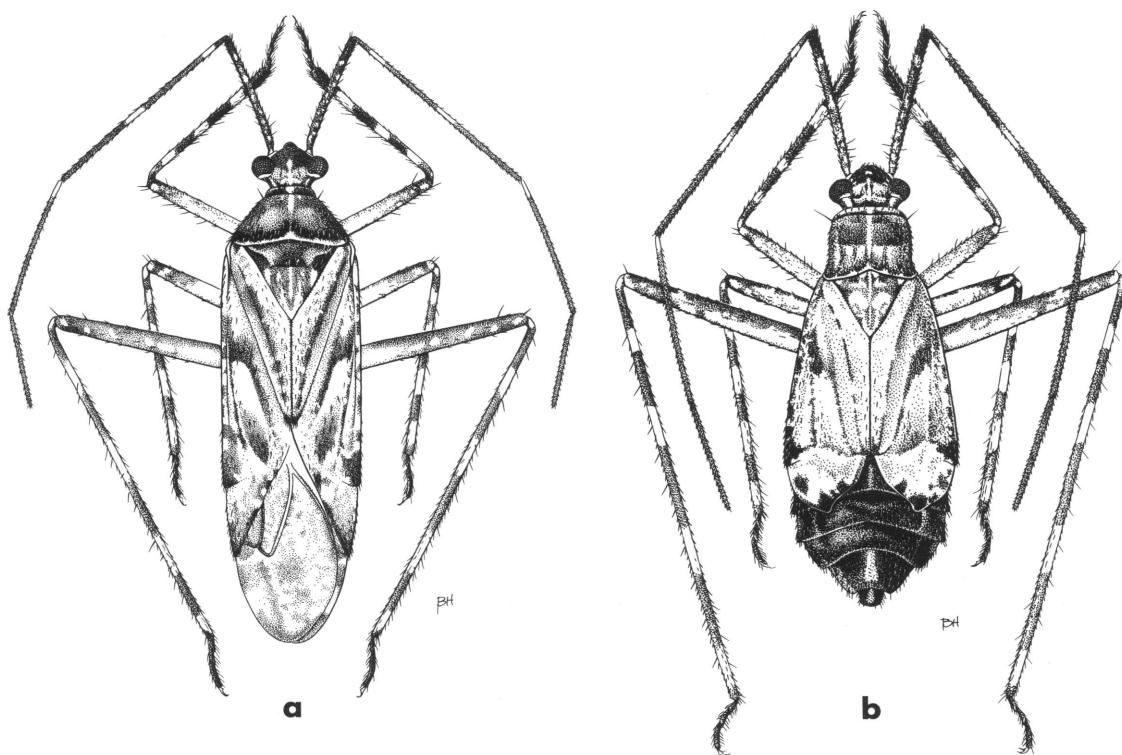
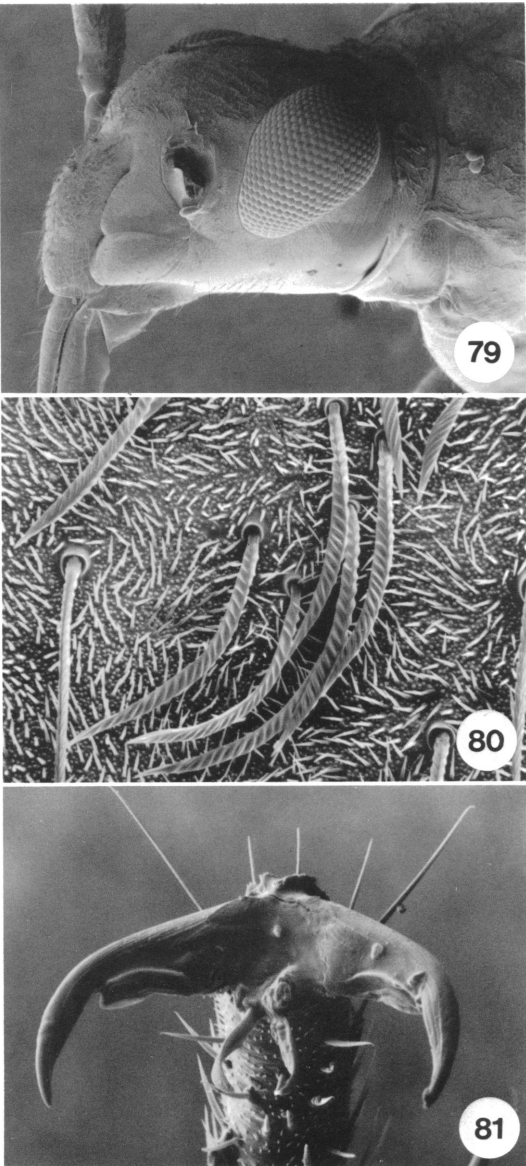


Fig. 78. *Phytocoris cinereus*. a. Dorsal habitus of male. b. Dorsal habitus of female.

length in lateral view less than width of vertex—occupying one-half to nearly two-thirds height of head. **Pronotum:** disk grayish white or pale grayish yellow, with brown to fuscous markings, sometimes with pale, median line; posterior submargin of disk with wavy, fuscous line or series of dark patches, and 4–6 weakly elevated, sometimes contiguous, tumid points; calli swollen, especially females; propleura fuscous, apical fourth to one-third and sometimes transverse median line pale, except propleura white with one or two fuscous stripes in *nigrolineatus*. **Hemelytra:** pale with brown to fuscous markings particularly along veins and on inner apical angle of corium, sometimes extensively darkened; membrane conspurcate. **Legs:** femora white or pale yellow, with reddish brown to fuscous markings, darkened areas usually interrupted by pale spots; dorsal surface of hind femora sometimes extensively darkened; tibiae pale with four or five dark annuli, dark bands sometimes obscured by pale spots. **Male genitalia:** genital capsule, except *brevisetosus*, with

well developed tubercles above paramere bases. *Left paramere:* sensory lobe weakly to strongly produced, somewhat conical in *sonorensis*, sometimes with small spines on dorsodistal surface; shaft narrowly expanded distally in dorsal view, or sometimes more broadly expanded and flattened laterally; apex rounded or truncate. *Right paramere:* shape variable; dorsal surface sometimes with spinose protuberance; apex acute or narrowly truncate. *Vesica:* primary membranous sac slightly to moderately reduced, usually with two or more distinct lobes, lobes sometimes with patches of close set, tiny spines or rarely with more broadly, dispersed, blunt tubercles; basal lobes sometimes weakly sclerotized in part; vesica with one or two sclerotized process, usually sickle- or trough-shaped and moderately to strongly curved, or rarely flattened and less strongly curved; basal process well sclerotized, extending to level of gonopore or beyond.

DISCUSSION: Members of the *hopi* group are widely distributed in the southwestern United



Figs. 79–81. *Phytocoris hopi*. 79. Dorsolateral view of head. 80. Sericeous setae of dorsal vestiture. 81. Pretarsus.

States, but do not occur in the American Desert Province. *Phytocoris alamogordo*, *apache*, *cinereus*, and *hopi* are distributed in Arizona, Colorado, New Mexico, western Texas, Utah, and Wyoming; *sonorensis* is restricted to the Chaparral Province of California; *nigrolineatus* is distributed throughout much of the Chaparral and Intermountain Sagebrush provinces, north to Deschutes Co., Oregon

and Owyhee Co., Idaho; and *brevisetosus* is widely distributed in the Intermountain Sagebrush Province from Inyo Co., California east to San Juan Co., Utah and Yavapai Co., Arizona on the Colorado Plateau. The host plant associations of these species are varied: *cinereus*, *hopi*, and *nigrolineatus* occur primarily on shrubby plants such as *Artemisia*, *Cercocarpus*, *Chrysothamnus*, *Gutierrezia*, and *Rhus*; *apache* and *hopi* are frequently collected on *Quercus*; and *brevisetosus* seems to be restricted to *Juniperus*. The host associations of *alamogordo* and *sonorensis* are not known.

Hopi group species are most similar to species of the *rostratus*, *pulchricollis*, and *candidus* groups, with which they share the following derived features: elongate head with broadly developed gena and gula, prominent tylus, strongly convex frons, and small eyes; posterior submargin of pronotal disk with weakly elevated, tumid points; dorsal vestiture including narrow, dark, scalelike setae; and primary membranous sac of vesica slightly to moderately reduced.

KEY TO SPECIES OF
THE HOPI GROUP

- 1 Pronotal disk with pale, longitudinal line medially 2
- Pronotal disk without pale median line .. 5
- 2(1) Antennal segment I with two full length pale lines, females sometimes with only one clearly defined line; propleura pale with two fuscous stripes; male genitalia as in figure 87 *nigrolineatus* Knight
- Antennal segment I with pale markings, but lacking distinct longitudinal lines; propleura fuscous, apical third and sometimes dorsal margin and/or anteromedial stripe pale 3
- 3(2) Antennal segment I mostly pale dorsally, with limited brown or reddish brown markings; dorsal margin of propleura pale; male rostrum reaching base of genital capsule, length 3.65–3.80; genital capsule without tubercles above paramere bases (fig. 84a) *brevisetosus* n. sp.
- Antennal segment I brown or dark brown dorsally, with scattered pale maculae; dorsal margin of propleura fuscous; male rostrum reaching between fifth and seventh abdominal segments, length 2.95–3.58; genital capsule with tubercles above paramere bases 4

- 4(3) Ratio of length of antennal segment I to posterior width of pronotum 0.85:1 to 1.00:1 for males and 1.40:1 to 1.55:1 for females; shaft of left paramere broadly expanded distally in dorsal view (fig. 85c); vesica with two sclerotized processes (fig. 85e, f) . . .
 *cinereus* n. sp.
- Ratio of length of antennal segment I to posterior width of pronotum 1.00:1 to 1.35:1 for males and 1.55:1 to 1.80:1 for females; shaft of left paramere only slightly expanded distally in dorsal view (fig. 86c); vesica with single sclerotized process (fig. 86e) *hopi* Knight
- 5(1) Left genital tubercle broader than long (fig. 82a); left basal lobe of vesica with two patches of stout spines; body length 5.95 (holotype) *alamogordo* n. sp.
- Left genital tubercle longer than broad (figs. 83a, 88a); left basal lobe of vesica without spines; body length 6.20–8.60 6
- 6(5) Ventral surface of antennal segment I mostly pale; sensory lobe of left paramere strongly produced (fig. 88b) . . . *sonorensis* Van D.
- Ventral surface of antennal segment I fuscous with small pale spots; sensory lobe of left paramere weakly produced (fig. 83b) . . .
 *apache* Knight

***Phytocoris alamogordo*, new species**

Figure 82

HOLOTYPE MALE: Alamogordo, [Otero Co.], New Mexico, 28 April 1902, E. P. Van Duzee Collection (CAS).

DIAGNOSIS: Recognized by the small size; rostrum not reaching beyond hind coxae; pronotal disk without pale, longitudinal line medially; and structure of the male genitalia, especially the broad left genital tubercle (fig. 82a), shape of the sclerotized process of the vesica (fig. 82e), and left basal lobe of vesica with two patches of stout spines.

DESCRIPTION: *Male holotype*. Length 5.95, width 2.10; dark brown general coloration. **Head**: width across eyes 0.97, vertex 0.46; grayish white ground color; vertex and frons extensively darkened with brown, frons with slightly darker striae laterally; tylus, jugum, lorum, gena, and region behind eyes marked with dark reddish brown. **Rostrum**: length 2.50, reaching between hind coxae. **Antennae**: missing. **Pronotum**: brownish gray; posterior submargin of disk with darker fuscous line, extreme posterior margin pale; collar yellowish brown; collar and calli with reddish

brown markings; propleura fuscous, apical third pale. **Scutellum**: brownish yellow with fuscous markings midlaterally and anteromedially. **Hemelytra**: brownish gray with darker brown markings mostly along veins, embolium and on cuneus; outer half of clavus, inner margin of corium, inner half of corium bordering claval apices, and apex of cuneus mostly brown; large patch on posteromedial margin of corium grayish white; membrane extensively mottled with brown, veins brown, pale distally. **Legs**: front and middle femora grayish yellow with reddish brown markings mostly on distal half; front and middle tibiae pale with four (front) or five (middle) dark reddish brown annuli including narrow basal band; hind legs missing. **Vestiture**: as noted in group description. **Genitalia**: Figure 82.

Female. Unknown.

ETYMOLOGY: Named for the type locality; a noun in apposition.

DISCUSSION: *Phytocoris alamogordo* is known only from the male holotype. Additional specimens of this species may be found in collections of Mexican Miridae (e.g., TA&M). The host plant association is not known.

***Phytocoris apache* Knight**

Figure 83

Phytocoris apache Knight, 1928: 41, 42. – Carvalho, 1959: 191. – Knight, 1968: 249.

TYPES: *Phytocoris apache* was described from 11 specimens collected in Coconino and Yavapai counties, Arizona, and a single male specimen taken in Grant Co., New Mexico. The male holotype and one paratype were collected at Williams, Coconino Co., Arizona, 2134 m, 24 June 1925, A. A. Nichol. All type material is retained in the Knight Collection (USNM); six paratypes were not located.

DIAGNOSIS: Length: male 7.5–8.6, female 7.0–7.3. *Phytocoris apache* is very similar to *cinereus* and *hopi* but is easily distinguished by the absence of a pale, median line on the pronotal disk, and the male genitalic structures: left genital tubercle large, well removed from the base of the left paramere (fig. 83a); sensory lobe of left paramere weakly produced, without spines on inner surface (fig.

83b); right paramere long, narrow (fig. 83d); sclerotized process of vesica sickle-shaped (fig. 83e).

DISCUSSION: The distribution of *apache* ranges across much of the Gila Mts. Forest Province of central Arizona and west central New Mexico; records ranging from Silver City, New Mexico, north and west to the Hualapai Mts. in Mohave Co., Arizona. Specimens also were seen from the Chiricahua and Huachuca Mts., Cochise Co., Arizona. Adults and nymphs have been collected on several species of *Quercus*. I have examined 52 specimens with collection dates from April 29 to August 17.

***Phytocoris brevisetosus*, new species**

Figures 84

HOLOTYPE MALE: Bridges Nat. Mon., San Juan Co., Utah, 14 July 1967, at light, G. F. Knowlton (USNM).

PARATYPES: ARIZONA. **Yavapai Co.:** 1 female, 1 mi E Stoneman Lk. interchange on Int. 17, 1585 m, 15 June 1983, ex. *Juniperus* sp., R. T. Schuh and M. D. Schwartz (AMNH). CALIFORNIA. **Inyo Co.:** 1 male, Wyman Cyn., White Mts., 9 July 1967, at light, Saul and Suzy Frommer (UCR). NEVADA. **White Pine Co.:** 1 female, 6 mi SW Ely, 1980 m, 24 June 1966, W. Gagne (USNM); 2 females, Little Antelope Summit on St. Hwy. 50, 2270 m, 11 August 1980, ex. *Juniperus* sp., G. M. Stonedahl (AMNH); 1 female, *ibid.*, except 19 July 1986, R. T. Schuh (AMNH).

DIAGNOSIS: Recognized by the mostly pale first antennal segment with limited brown or reddish brown markings, ratio of segment length to posterior width of pronotum 1.12:1 to 1.15:1 for males and 1.78:1 to 1.96:1 for females; pronotal disk with pale, longitudinal line medially; propleura fuscous with dorsal margin and apical third pale; rostrum of male reaching base of genital capsule, length 3.65–3.80; and structure of the male genitalia, especially the genital capsule without tubercles above paramere bases (fig. 84a).

DESCRIPTION: *Male.* Length 7.15–7.25, width 2.12–2.20; grayish white ground color with brown to fuscous markings. **Head:** width across eyes 1.18–1.19, vertex 0.50–0.51; white or pale yellow with brown or reddish brown

markings on tylus, junction of jugum and lorum, lorum and gena bordering buccula, borders of antennal fossae, and behind eyes; frons with 6–8 brownish striae laterally, pale medially. **Rostrum:** length 3.65–3.80, reaching base of genital capsule. **Antennae:** I, length 1.94–2.01, mostly pale dorsally and laterally with scattered, faint, brownish maculae, ventral surface mostly brown, tinged with red distally; II, length 3.60–3.68, brownish yellow, slightly paler medially; III, length 1.96, brownish yellow; IV, missing. **Pronotum:** medial length 1.02–1.11, posterior width 1.73–1.75; grayish white, lightly tinged with brown, median longitudinal line white; lateral margins of disk narrowly fuscous, posterior submargin with series of fuscous patches; collar and calli with limited reddish brown or fuscous markings; propleura fuscous, dorsal margin and apical third pale. **Scutellum:** grayish white; midlateral margins with fuscous mark; middle with pale, longitudinal line, bordered anteriorly with fuscous. **Hemelytra:** grayish white with reddish brown or fuscous markings along veins, embolium, and margins of cuneus; outer half of clavus, broad inner margin of corium, and posteromedial region of corium mostly fuscous; membrane conspurcate, veins mostly pale. **Legs:** femora pale grayish yellow with moderate distribution of reddish brown or fuscous markings; anterior margin and distal third of hind femora more extensively darkened; tibiae pale with four broad, reddish brown annuli; dark annuli on hind tibiae less distinct. **Vestiture:** as noted in group description, with very short simple setae. **Genitalia:** Figure 84.

Female. Strongly brachypterous, abdomen reaching well beyond apex of hemelytra, hemelytral membrane reduced to narrow flap. Similar to male in color and vestiture; head and vertex slightly broader and antennae longer than for male. Length 6.85–7.25, width 2.21–2.38. **Head:** width across eyes 1.25–1.34, vertex 0.59–0.62. **Rostrum:** length 4.10–4.35, reaching base of ovipositor or slightly beyond. **Antennae:** I, 2.48–2.65; II, 4.35–4.55; III, 2.51–2.80; IV, 1.50–1.67. **Pronotum:** mesal length 0.90–0.98, posterior width 1.35–1.45.

ETYMOLOGY: From the Latin, *brevis* (short) and *setosus* (bristly), referring to the short bristlelike setae on the dorsum.

DISCUSSION: *Phytocoris brevisetosus* is known from several broadly separated localities in California, Nevada, Utah, and Arizona. Four of the five female paratypes were collected on juniper; the holotype and male paratype were taken at light.

***Phytocoris cinereus*, new species**

Figures 78, 85

HOLOTYPE MALE: Red Rocks Park, nr. Morrison, 5600 ft (1710 m), Jefferson Co., Colorado, 15 July 1983, ex. *Rhus trilobata* Nutt., R. T. Schuh and D. A. Polhemus (AMNH).

PARATYPES: ARIZONA. Cochise Co.: 1 male, T17S, R31E, Sec. 3, 20 October 1958, ex. *Flourensia* (USNM). COLORADO. Chaffee Co.: 1 female, Salida, 24 July 1900, E. P. Van Duzee (CAS). Douglas Co.: Head of Highline Canal, J. T. Polhemus (JTP): 3 males, 1 female, 3 July 1978; 2 females, 18 July 1978. Waterton, ex. *Chrysothamnus* sp., D. A. Polhemus (JTP): 4 males, 5 females, 13–25 September 1982; 1 male, 15 July 1983; 1 male, 7 October 1983. El Paso Co.: 1 male, Colorado Springs, 1830 m, 5 July 1935, H. Ruckes (USNM). Fremont Co.: 1 male, Royal Gorge, 3 July 1949, R. H. Beamer (KU). Saguache Co.: 2 males, Valley View Spgs., 7 mi E Mineral Hot Spgs. on W foot of Sangre de Cristo Range, 2590 m, 13 August 1965, H. B. Leech (CAS). NEW MEXICO. Eddy Co.: 1 male, Carlsbad Caverns, 16 May 1927, J. O. Martin (CAS). Lincoln Co.: 1 male, Valley of Fires St. Pk., 6 June 1977, Knowlton and Hanson (USU). Union Co.: 2 males, Mt. Capulin Nat. Mon., 20 July 1968, taken at light, J. C. Schaffner (SHF). TEXAS. Brewster Co.: 2 males, Green Gulch, Big Bend Nat. Pk., 1740 m, 3–14 August 1968, at bl. light, J. E. Hafernik (TA&M). Culberson Co.: 1 male, McKittrick Cyn., Guadalupe Nat. Pk., 19 August 1969, Board and Hafernik (TA&M). Gonzales Co.: 1 male, Palmetto St. Pk., 7 June 1969, Board and Hafernik (TA&M). Jeff Davis Co.: 1 male, 1 mi W Fort Davis, 20 July 1968, at black light, J. E. Hafernik (TA&M).

DIAGNOSIS: *Phytocoris cinereus* is very similar to *hopi* but is distinguished by the shorter first antennal segment and structure of the male genitalia: ratio of length of antennal segment I to posterior width of pronotum 0.85:

1 to 1.00:1 for males and 1.40:1 to 1.55:1 for females; sensory lobe of left paramere strongly produced (fig. 85b), shaft broadly expanded and flattened distally (fig. 85c); right paramere strongly arched dorsally, apex blunt (fig. 85d), vesica with two sclerotized processes (fig. 85e, f), left process large, trough-shaped.

DESCRIPTION: *Male.* Length 7.18–8.00, width 1.91–2.34; brownish gray general coloration. **Head:** width across eyes 1.07–1.14, vertex 0.50–0.54; white or pale yellow; base of jugum, dorsal margin of lorum, base of buccula, and tylus marked with reddish brown to fuscous; frons extensively infuscated, marked with pale stripe or series of spots medially; vertex tinged with brown, usually with pale stripe medially. **Rostrum:** length 3.25–3.58, reaching between fifth and seventh abdominal segments. **Antennae:** dark brown or fuscous; I, length 1.45–1.85, with scattered pale spots; II, length 2.82–3.38, with narrow pale annulus just beyond base and at middle; III, length 1.87–2.10, narrowly pale basally; IV, length 1.15–1.39. **Pronotum:** mesal length 1.00–1.17, posterior width 1.66–1.94; disk grayish white or pale grayish yellow, lightly to moderately tinged with brown, median line pale; posterior submargin of disk with transverse, fuscous line and 4–6 weakly elevated, setiferous tubercles, extreme posterior margin pale; collar fuscous with pale spot medially and at lateral margins; calli moderately to extensively infuscated; propleura fuscous, usually with incomplete pale line medially, apical third white. **Scutellum:** grayish white or pale yellow with brown to fuscous markings, sometimes with narrow pale line medially bordered by fuscous, apex broadly pale either side of dark mesal area. **Hemelytra:** grayish white, moderately to extensively darkened with brown to fuscous particularly along veins, outer half of clavus, inner margin and apical angles of corium, and on cuneus; clavus mostly pale mesad of vein; corium usually with distinct pale region medially and at apex; membrane densely conspurcate, outer margin with two pale spots. **Legs:** femora white or pale yellow, moderately to extensively darkened with reddish brown to fuscous, dark areas with small pale spots; hind femora mostly darkened on dorsal aspect and with fewer pale spots; tibiae pale with four

or five fuscous annuli; dark annuli on hind tibiae less distinct. **Vestiture:** as noted in group description. **Genitalia:** Figure 85.

Female. Strongly brachypterous, abdomen reaching well beyond apex of hemelytra, wing membrane reduced to narrow flap. Similar to male in color and vestiture. Length 5.45–6.70, width 2.09–2.30. **Head:** width across eyes 1.09–1.15, vertex 0.52–0.57. **Rostrum:** length 3.43–3.67, reaching base of ovipositor or slightly beyond. **Antennae:** I, 1.96–2.05; II, 3.40–3.67; III, 2.05–2.25; IV, 1.44–1.48. **Pronotum:** mesal length 0.79–0.88, posterior width 1.31–1.40.

ETYMOLOGY: From the Latin, *cinereus* (ash-colored, gray), referring to the general coloration of the species.

DISCUSSION: *Phytocoris cinereus* is known from southwestern Arizona, Colorado, New Mexico, and western Texas. Adults have been collected on *Chrysothamnus*, *Flourensia*, and *Rhus trilobata* Nutt. Collection dates are from June 6 to July 24.

Phytocoris hopi Knight

Figures 79–81, 86

Phytocoris hopi Knight, 1928: 42–44. – Carvalho, 1959: 201. – Knight, 1968: 249.

TYPES: Described from 17 specimens collected in Arizona, Colorado, and New Mexico. The male holotype and allotype were taken at Dolores, Montezuma Co., Colorado, 15 August 1925, H. H. Knight. All type material is deposited in the Knight Collection (USNM); five paratypes were not located.

DIAGNOSIS: Length: male 6.3–8.3, female 5.5–6.8. *Phytocoris hopi* is distinguished from other species of the *hopi* group by the following combination of characters: antennal segment I fuscous with pale spots, ratio of length of segment to posterior width of pronotum from 1.00:1 to 1.35:1 for males and 1.55:1 to 1.80:1 for females; rostrum reaching between fifth and seventh abdominal segments, length 2.95–3.58; propleura fuscous, apical third pale; pronotal disk with pale, median line; vesica with single, trough-shaped sclerotized process (fig. 86e); shaft of left paramere only slightly expanded distally (fig. 86c).

DISCUSSION: This species is widely distributed in Arizona, Colorado, New Mexico, and Utah but has not been collected in the So-

noran Desert region of Arizona, the Intermountain Sagebrush section of western Utah, or the eastern prairie regions of Colorado and New Mexico. Several specimens also were seen from Lincoln Co., Wyoming. Adults and nymphs have been taken on *Artemisia tridentata* Nutt., *Cercocarpus ledifolius* Nutt., *C. montanus* Raf., and *Quercus gambelii* Nutt. Several adult specimens also were collected on *Amelanchier utahensis* Koehne and *Symphoricarpos* sp. Males are attracted to light. I have examined 116 specimens with collection dates from June 14 to October 14.

Phytocoris nigrolineatus Knight

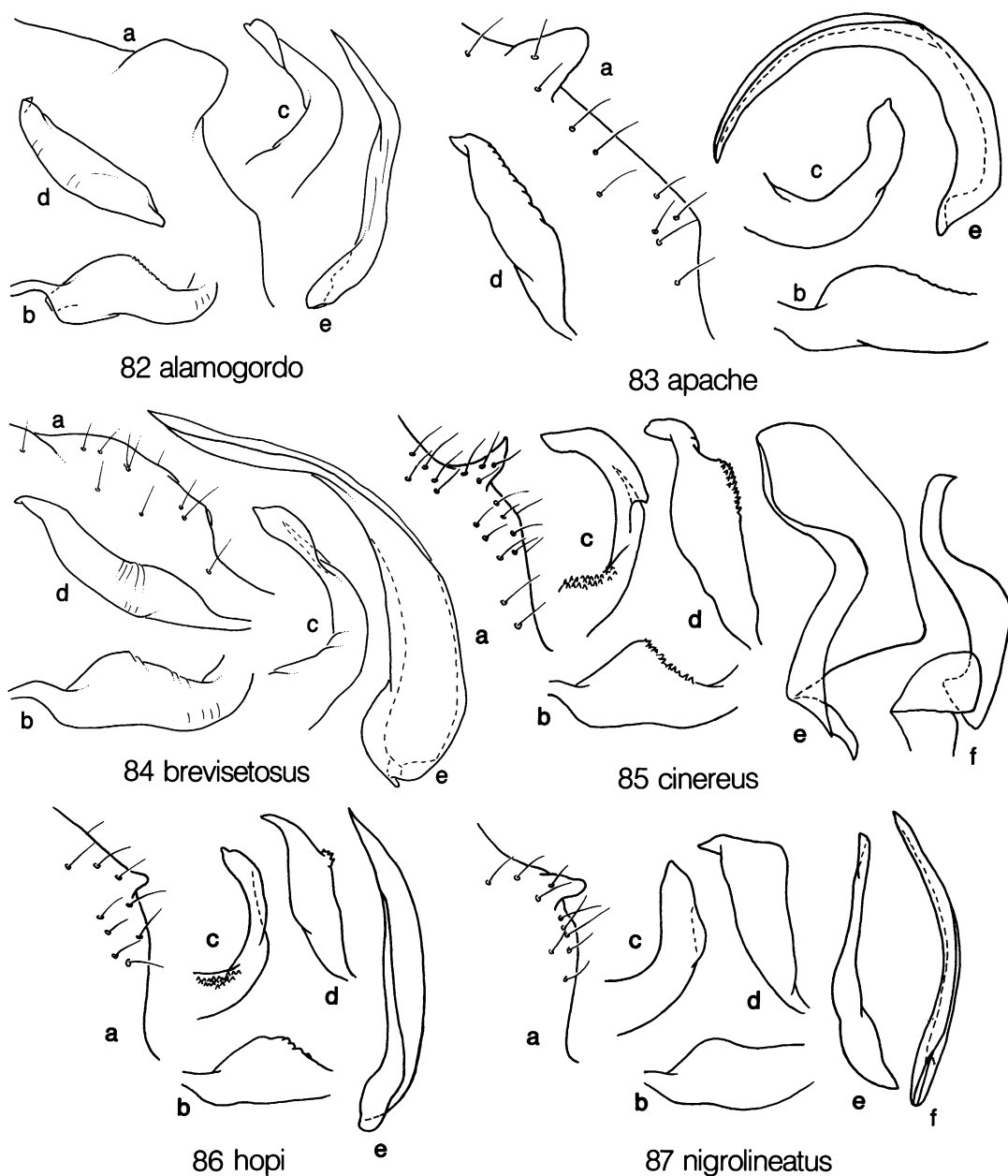
Figure 87

Phytocoris nigrolineatus Knight, 1968: 224, 225, fig. 262.

TYPES: Described from 11 specimens collected in Nye and Washoe counties, Nevada. The male holotype was taken in Area 6M, Nevada Test Site, Nye Co., Nevada, 17 June 1965, ex. *Salazaria mexicana* Torr., H. H. Knight and J. M. Merino. The holotype, allotype, and six paratypes are retained in the Knight Collection (USNM); one male paratype each is deposited in the collections of BYU and UCB; and one paratype was not located.

DIAGNOSIS: Length: male 6.5–7.7, female 5.2–6.4. *Phytocoris nigrolineatus* is distinguished from other species of the *hopi* group by the full length pale line(s) on the first antennal segment, pale propleura with two fuscous stripes, pale median line on the pronotal disk, and the following genitalic characters: left paramere with weakly produced sensory lobe (fig. 87b), shaft short and broad (fig. 87c); right paramere strongly arched dorsally (fig. 87d); vesica with two, narrow sclerotized processes (fig. 87e, f).

DISCUSSION: *Phytocoris nigrolineatus* is widely distributed in the Intermountain Sagebrush Province of the central western United States. Specimens have been collected from Clark Co., Nevada; north and west to Deschutes Co., Oregon; and east through southern Idaho to the Wasatch Plateau of central Utah. This species also occurs in southwestern Utah and the Chaparral Province of California; records ranging from the San Jacinto Mts., Riverside County, to Coal-



Figs. 82-87. Male genitalia of *hopi* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica, or left sclerotized process for *cinereus* and *nigrolineatus*. f. Right sclerotized process of vesica for *cinereus* and *nigrolineatus*.

inga in Fresno County. The primary host plant of this species is *Artemisia tridentata* Nutt., but specimens also have been collected on *Chrysothamnus viscidiflorus* (Hook.) Nutt., *Coleogyne ramosissima* Torr., *Ephedra nevadensis* Wats., *Eriogonum fasciculatum*

Benth., *Gutierrezia sarothrae* (Pursh) Britt & Rusky, *Purshia glandulosa* Curran and *Salazaria mexicana* Torr. Males are attracted to light. I have examined 76 specimens with collection dates from May 11 to September 9.

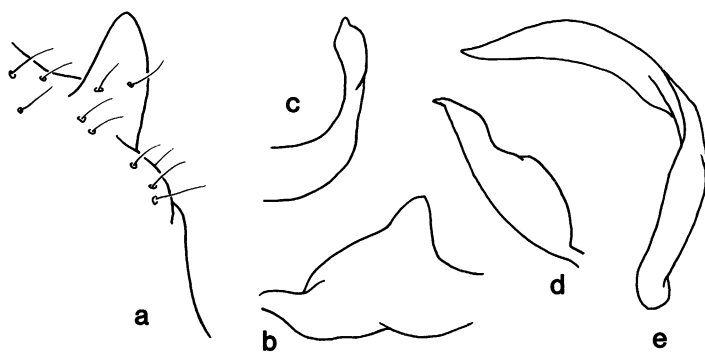
88 *sonorensis*

Fig. 88. Male genitalia of *sonorensis*. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

Phytocoris sonorensis Van Duzee

Figure 88

Phytocoris sonorensis Van Duzee, 1920: 342, 343.
– Carvalho, 1959: 217. – Knight, 1968: 249, fig. 305.

TYPES: *Phytocoris sonorensis* was described from four specimens collected in San Diego Co., California. The male holotype (no. 692) and a single male paratype were taken at Alpine, 7 June 1913, E. P. Van Duzee. The allotype (no. 2004) and one female paratype were collected at Descanso, Cuyamaca Mts., 1524 m, 5 October 1913, E. P. Van Duzee. I have examined the female specimens and they are not conspecific with the holotype. They are correctly identified as *ceanothicus* and bear my identification label for this species. All of the above specimens are retained in the Van Duzee Collection (CAS) except the male paratype which is deposited in the Knight Collection (USNM).

DIAGNOSIS: Length: male 6.2–7.0, female 6.35. Recognized by the pale ventral surface

of antennal segment I; pronotal disk without pale, median line; genital capsule of male with large, vertical tubercle well removed from base of left paramere (fig. 88a); sensory lobe of left paramere strongly produced (fig. 88b); right paramere with concave region dorsally (fig. 88d); and vesica with single sclerotized process (fig. 88e) and left basal lobe without spines.

DISCUSSION: *Phytocoris sonorensis* occurs in the Chaparral Province of southwestern California. I have examined 11 specimens from the following localities: CALIFORNIA. **Calaveras Co.:** 4 mi E Murphy's (CAS). **Los Angeles Co.:** Claremont (CAS); Mint Cyn. (OSU); Tanbark Flat (UCB, UCD). **San Diego Co.:** Poway Green Valley (SDNH); Pine Valley (SDNH). **Tulare Co.:** California Hot Springs (CAS); Terminus Res. Camp, 5 mi W Three Rivers (SHF). The host plant association is not known, but I would speculate that this species inhabits a shrubby plant such as *Ceanothus*. The period of occurrence is from April 19 to July 24.

INTERSPERSUS SPECIES-GROUP

DIAGNOSIS: Recognized by the brownish yellow general coloration with red markings; short head with weakly protruding frons and large eyes (fig. 90); scutellum with dark spot either side before apex (fig. 89); and structure of the male genitalia, especially the flattened, serrate sclerotized process, broadly attached along inner-basal margin to primary mem-

branous sac of vesica, and genital capsule without or with very small tubercle above base of left paramere. The head structure, dorsal vestiture, and male genitalia indicate a strong relationship between *interspersus* group species and members of the *stellatus* and *tiliae* groups.

DESCRIPTION: Moderate size, 6.0–7.7, yel-

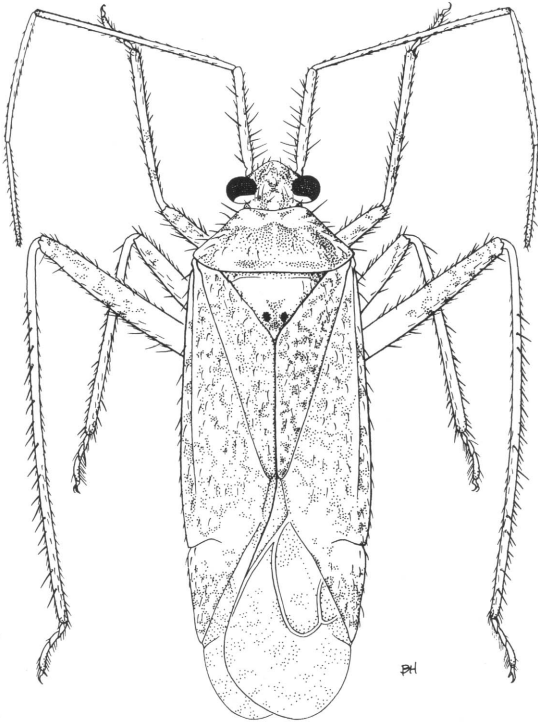


Fig. 89. *Phytocoris kiowa*, dorsal habitus of male.

low or brownish yellow species with red and brown markings; dorsum with golden to dark brown, simple setae and silvery white, sericeous setae. **Head:** short anteroposteriorly with weakly protruding frons; antennae pale yellow or brownish yellow, segment I longer than width of head across eyes; frons weakly to moderately convex, meeting tylus along shallow depression, usually with several reddish striae laterally; eyes large, length in lateral view much greater than width of vertex. **Pronotum:** disk lightly to moderately marked with red and/or brown, posterior submargin sometimes with transverse series of red to fuscous patches; propleura pale, sometimes with red anteromedial stripe; scutellum moderately to strongly convex, sometimes abruptly deflexed apically, marked with red to fuscous spot either side before apex. **Hemelytra:** white or pale yellow, lightly to moderately mottled with red and/or brown; corium usually with large pale region on inner apical angle; membrane spotted or mottled with brown to fuscous. **Legs:** femora pale yellow with red or reddish brown markings; hind femora often with reticulate pattern, some-

times with pale preapical band; tibiae pale yellow, sometimes lightly marked with red or with several poorly defined reddish annuli.

Male genitalia: genital capsule without tubercles, except small protuberance present above base of left paramere in *hypoleucoides* and *kiowa*. **Left paramere:** sensory lobe weakly to strongly produced; shaft swollen basally, slightly to moderately expanded distally in dorsal view; apex laterally flattened, truncate or narrowly rounded in lateral view. **Right paramere:** lanceolate to somewhat elongate, apex acute. **Vesica:** primary membranous sac unilobed, elongate, apex of lobe set with tiny spines; left basal lobe also with spinulae apically; basal process well sclerotized, extending to level of gonopore or slightly beyond, continuous with base of sclerotized process or separated by narrow membranous region; sclerotized process with 2–4 large toothlike serrations, broadly attached along inner-basal margin to primary membranous sac.

DISCUSSION: With the exception of *eurekae*, the members of this group are restricted to Arizona, southern Colorado, and New Mexico. The former species is distributed in forested regions across much of western North America. All *interspersus* group species, except *eurekae*, are inhabitants of *Quercus*. *Phytocoris eurekae* has been collected on a variety of trees and shrubs, as well as several herbaceous plants.

KEY TO SPECIES OF THE *INTERSPERSUS* GROUP

- 1 Hemelytra marked or tinged with green or bluish green, particularly on cuneus and distal portion of corium 2
- Hemelytra without green markings 3
- 2(1) Scutellum strongly convex, abruptly deflexed apically, spots before apex large and dark; sclerotized process of vesica as in figure 94e *interspersus* Uhler
- Scutellum moderately and evenly convex, not abruptly deflexed apically, spots before apex small and faint; sclerotized process of vesica as in figure 93e *hypoleucoides* n. sp.
- 3(1) Antennal segment II brownish yellow, with apex narrowly infuscated; sclerotized process of vesica with two strong serrations apically (fig. 96e) *navajo* n. sp.
- Antennal segment II uniformly yellow or brownish yellow, not darkened distally; sclerotized process of vesica with three apical serrations (figs. 92e, 95e) 4

- 4(3) Corium between anal ridge and radial vein with long golden simple setae; proximal fourth of hind tibiae with dark spots at spine bases; dorsal width of eye for males equal to or less than width of vertex; genital capsule with small tubercle above base of left paramere (fig. 95a) *kiowa* n. sp.

Corium between anal ridge and radial vein with scattered, dark brown simple setae; hind tibiae without dark spots at spine bases; dorsal width of eye for males much greater than width of vertex; genital capsule without tubercle above base of left paramere (fig. 92a) *eurekae* Bliven

Phytocoris eurekae Bliven

Figures 90–92

Phytocoris eurekae Bliven, 1966: 116, pl. X, figs. 8, 9.

TYPES: Described from two males collected in Humboldt County, California by B. P. Bliven. The holotype (no. 13872) was taken at Falk, 27 July 1958, "on willow," and a single paratype was collected at Eureka on 24 August 1959. Both specimens are retained in the collection of the CAS.

DIAGNOSIS: Length 6.0–7.3. *Phytocoris eurekae* is distinguished from other species of the *interspersus* group by the following combination of characters: hemelytra with scattered, dark brown, simple setae particularly at apex of clavus and on corium between anal ridge and radial vein; second antennal segment uniformly brownish yellow, not darkened apically as in *navajo*; dorsal width of eye of male much greater than width of vertex; hind tibiae without dark spots at spine bases; shaft of left paramere narrowly and gradually expanded distally (fig. 92c); and sclerotized process of vesica with three apical serrations (fig. 92e).

DISCUSSION: *Phytocoris eurekae* is widely distributed in the western United States except for the American Desert Province, Intermountain Sagebrush Province, and most of central and southern California. This species also occurs in southern British Columbia, Canada. In the Pacific Coast states, *eurekae* has been collected in the coast ranges as far south as Humboldt Co., California and east to the eastern slopes of the Cascade Range. The distribution extends across northern Washington, and northern and central Idaho, to the Rocky Mts. in Wyoming,

Colorado, and New Mexico. The southernmost records in New Mexico are 18 mi E Alma, Catron County and 2 mi S Cloudcroft, Otero County. Specimens also have been collected throughout the northern and central mountain highlands of Utah, as well as the Santa Catalina Mts. and Chiricahua Mts. in Arizona.

Phytocoris eurekae is most common in open forest situations or clearcuts where it occurs on a variety of shrubs and trees. Adult specimens have been collected from the following plants, mostly in the Pacific Coast states: *Abies procera* Rehd., *Acer circinatum* Pursh., *Alnus rubra* Bong., *Arctostaphylos* sp., *Castanopsis chrysophylla* (Dougl.) A. DC., *Corylus cornuta* Marsh., *Holodiscus discolor* (Pursh.) Maxim., *Juniperus* sp., *Myrica californica* Cham. & Schlect., *Quercus gambelii* Nutt., *Q. garryana* Dougl., *Pseudotsuga menziesii* (Mirb.) Franco., *Ribes* sp., *Robinia neomexicana* Gray, *Shepherdia canadensis* (L.) Nutt., *Vaccinium* sp. Specimens are occasionally taken on herbaceous plants such as fireweed, *Epilobium angustifolium* L. Males and females have been collected at light. I have examined several hundred specimens with collection dates from June 15 to October 4.

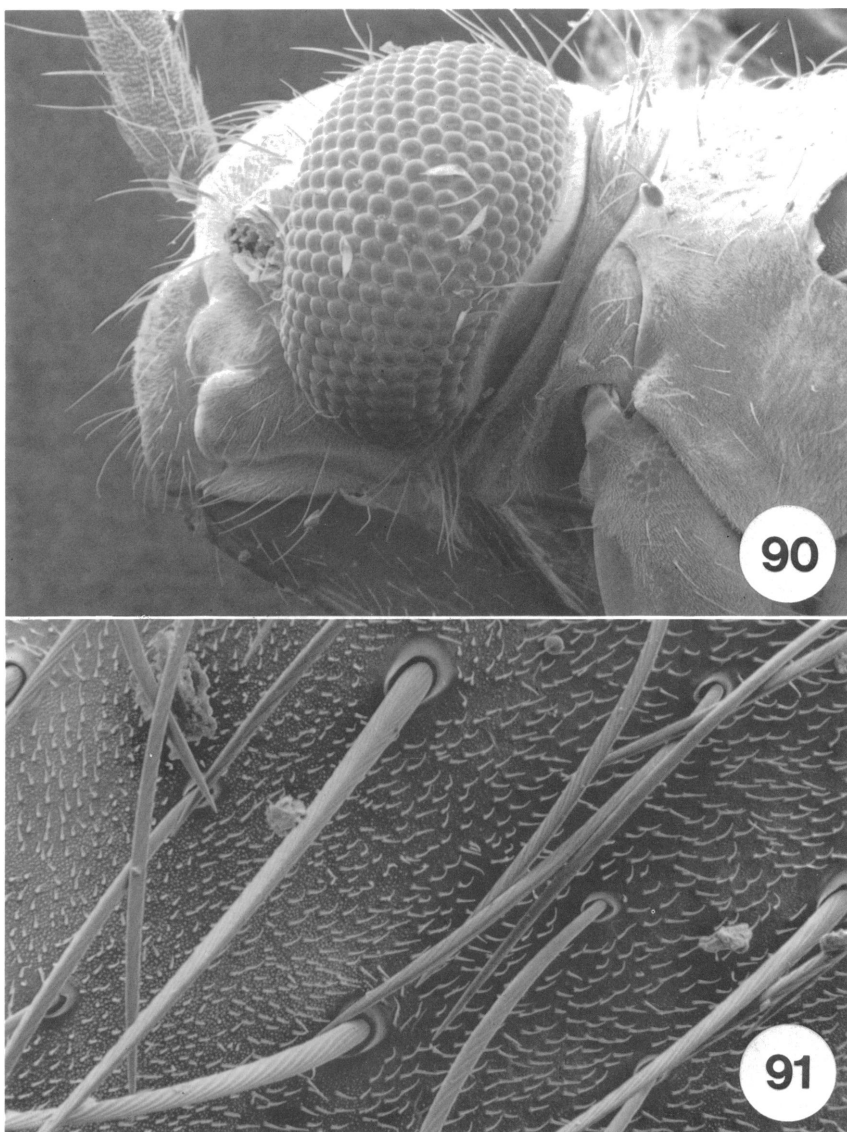
Phytocoris hypoleucoides, new species

Figure 93

HOLOTYPE MALE: Windy Pt. Vista, 1920 m, Santa Catalina Mts., Pima Co., Arizona, 12 June 1983, ex. *Quercus hypoleucoides* A. Camus, R. T. Schuh and M. D. Schwartz (AMNH).

PARATYPES: ARIZONA. **Cochise Co.:** Chiricahua Mts.: 1 male, 5 females, Cave Crk. Cyn., E Turkey Crk., 6.5 mi W of Portal, 1950 m, 30 May 1982, ex. *Quercus hypoleucoides* and *Q. emoryi* Torr., B. Barientos (AMNH); 2 females, Cave Crk. Cyn., Herb Martyr Dam, 1768 m, 1 June 1982, ex. *Quercus hypoleucoides*, B. Barientos (AMNH); 1 male, 2 females, Onion Saddle, 2316 m, 29 May and 2 June 1982, ex. *Quercus hypoleucoides* and *Q. arizonica* Sarg., B. Barientos (AMNH). **Pima Co.:** 4 males, 3 females, same data as holotype (AMNH); 3 males, 4 females, San Pedro Vista Pt., 2225 m, Santa Catalina Mts., 12 June 1983, ex. *Quercus hypoleucoides*, R. T. Schuh and M. D. Schwartz (AMNH).

DIAGNOSIS: Recognized by the pale yellow-



Figs. 90, 91. *Phytocoris eureka*. 90. Lateral view of head. 91. Dorsal vestiture.

ish white hemelytra with faint bluish green tinge, particularly on the cuneus and distal portion of the corium; scutellum moderately and evenly convex with small faint spot either side before apex, not abruptly deflexed apically; and structure of the male genitalia (fig. 93).

DESCRIPTION: *Male*. Length 6.55–6.80, width 2.16–2.26; pale greenish yellow general coloration with faint brownish orange markings. **Head:** width across eyes 1.08–1.09, vertex 0.42–0.45; creamy white; frons with or-

ange fascia medially and orange spot bordering inner margin of antennal fossa and at anterodorsal angle of eye; frons moderately convex, meeting tylus along broad depression; eyes occupying two-thirds of head height or slightly less. **Rostrum:** length 2.60–2.72, reaching fourth or fifth abdominal segment. **Antennae:** pale brownish yellow, first segment sometimes with faint brown markings dorsally; I, length 1.60–1.69, with scattered erect pale bristlelike setae; II, length 2.80–3.00; III, length 1.48–1.70; IV, length 0.91–

1.17. **Pronotum:** mesal length 0.95–0.99, posterior width 1.66–1.81; creamy white or pale yellow, sometimes with faint bluish green tinge; anterolateral angle with orange fascia that reaches onto collar; collar with broad orange fascia either side of middle that extends to base of calli; posterior lobe of disk with four orange longitudinal fasciae; propleura uniformly pale. **Scutellum:** moderately and evenly convex; pale yellow with faint orange markings basally, sometimes with tint of bluish green; apex with small brownish spot either side of middle. **Hemelytra:** yellowish white with scattered orange or brownish orange markings, especially along veins; corium and cuneus usually with distinct green or bluish green tinge; posteromedial angle of corium with dark, setose spot; membrane with scattered dark spots, mostly between cubital vein and outer margin; veins bluish green. **Legs:** femora pale yellow, hind pair sometimes more brownish yellow; tibiae uniformly pale yellow. **Vestiture:** dorsum with golden, simple setae and silvery white, sericeous setae. **Genitalia:** Figure 93.

Female. Similar to male in color, vestiture, and structure. Length 6.70–7.25, width 2.24–2.42. **Head:** width across eyes 1.04–1.14, vertex 0.48–0.52. **Rostrum:** length 2.70–2.80, reaching third or fourth abdominal segment. **Antennae:** I, 1.74–1.82; II, 3.05–3.15; III, 1.59–1.72; IV, 1.04–1.10. **Pronotum:** mesal length 0.94–1.05, posterior width 1.70–1.86.

ETYMOLOGY: Named for the host plant of the holotype and the majority of paratypes.

DISCUSSION: *Phytocoris hypoleucoides* is known from Cochise, Pima, and Santa Cruz counties, Arizona where it has been collected on *Quercus hypoleucoides* A. Camus, *Q. arizonica* Sarg., and *Q. emoryi* Torr.

ADDITIONAL SPECIMENS: Five specimens were examined from the following localities: **ARIZONA. Cochise Co.:** Chiricahua Mts. (KU, USNM); 1.5 mi towards Portal from Onion Saddle, 2350 m (AMNH); Huachuca Mts. (USNM). **Santa Cruz Co.:** Santa Rita Mts. (USNM). Collection dates are from June 12 to October 30.

Phytocoris interspersus Uhler
Figure 94

Phytocoris interspersus Uhler, 1895: 32, 33. – Van Duzee, 1903: 110. – Tucker, 1907: 60. – Reuter, 1909: 19, 20. – Van Duzee, 1917a: 316. – Knight,

1927a: 44. – Carvalho, 1959: 202. – Knight, 1968: 216. – Henry and Stonedahl, 1983: 454. *Phytocoris viridescens* Knight, 1961: 483, fig. 2. **NEW SYNONYMY.**

TYPES: *Phytocoris interspersus* was described from a single female specimen collected in Cheyenne Cyn., near Colorado Springs, El Paso Co., Colorado, July, Tucker. After conducting an unsuccessful search for the above specimen, Henry and Stonedahl (1983) designated a neotype for the species, assuming that the original type had been lost or destroyed. However, the Tucker specimen from Cheyenne Cyn. was subsequently discovered in a misplaced drawer of undetermined Miridae at the USNM. This specimen is hereby recognized as the holotype for the species and is identified by a red rectangular label with data, “**HOLOTYPE:** *Phytocoris interspersus* Uhler, det. by Stonedahl, 1988.” The holotype is deposited in the collection of the USNM. A request has been submitted to the International Commission on Zoological Nomenclature to revoke the neotype designation for *interspersus* on the grounds of rediscovered original type material.

The junior synonym *viridescens* was described from a pair of specimens collected in southern Colorado. The male holotype was taken at Stonewall, 2590 m, Las Animas Co., 7 August 1925, ex. *Eriogonum jamesii* Benth., H. H. Knight. The female allotype was collected at Dolores, Montezuma Co., 3 August 1900, E. D. Ball. Both specimens are retained in the Knight Collection (USNM).

DIAGNOSIS: Length 5.8–6.8. *Phytocoris interspersus* keys to the couplet with *hypoleucoides* but differs from this species by the strongly convex scutellum with large, dark spot either side before apex, and by the structure of the male genitalia. The genital capsule lacks a tubercle above the base of the left paramere (fig. 94a). The sensory lobe of the left paramere is weakly produced (fig. 94b), and the sclerotized process of the vesica has two strong serrations apically and one or two smaller serrations basally (fig. 94e). *Phytocoris interspersus* is easily distinguished from *eurekæ*, *kiowa*, and *navajo* by the green or bluish green tinge on the hemelytra.

DISCUSSION: This species has been collected in Colorado and New Mexico. In addition to type material, I have examined 12 speci-

mens from the following localities: COLORADO. **El Paso Co.:** Colorado Springs (CAS). **Jefferson Co.:** Deer Crk. Cyn., ex. *Quercus gambelii* Nutt. **Las Animas Co.:** Stonewall, 2440 m (JTP). NEW MEXICO. **Lincoln Co.:** Ruidoso (KU). **Torrance Co.:** Unspecified locality (KU). Collection dates are from June 26 to September 19. Specimens have been collected at several localities on *Quercus gambelii*. The *Eriogonum* record for the holotype of *viridescens* is probably an incidental host association.

Phytocoris interspersus has been misidentified by workers since its description in 1895. All subsequent descriptions and identifications of this species beginning with Van Duzee (1903) and culminating with the neotype designation of Henry and Stonedahl (1983) pertain to the species *eureka* Bliven (1966) described from northern California. Specimens identified by myself and bearing my determination labels for *interspersus* dated 1983 or earlier all belong to *eureka*. Knight (1961), unaware of the true identity of *interspersus*, redescribed this species under the name *viridescens*.

***Phytocoris kiowa*, new species**

Figures 89, 95

HOLOTYPE MALE: 2.3 mi E of Cloudcroft, Otero Co., New Mexico, 1947 (AMNH).

PARATYPES: ARIZONA. **Cochise Co.:** 2 females, Flys Peak, Chiricahua Mts., 2590–2956 m, 5 August 1927, J. A. Kusche (CAS, CAF&A); 3 females, Huachuca Mts., 29 July 1905, H. G. Barber (USNM). **Coconino Co.:** 1 female, 18 August 1927, P. A. Readio (KU); 1 female, Flagstaff, 2134 m, 5 August 1967, D. C. and K. A. Rentz (UCB); 1 male, Flagstaff, 29 July 1969, taken at light, C. D. Johnson (NAU); 6 females, 14 August 1927 and 1 female, 31 July 1933, Oak Crk. Cyn., R. H. Beamer (KU); Williams: 1 male, 9 July, H. S. Barber (USNM); 1 male, 1 female, 19 and 24 July, Barber and Schwarz (USNM); 2 males, 4 females, 4 August 1917, ex. "white oak" [probably *Q. gambelii* Nutt.], H. H. Knight (USNM). COLORADO. **Garfield Co.:** 1 female, Glenwood Springs, 17 August 1929, P. W. Oman (KU). **Las Animas Co.:** 4 females, Stonewall, near Trinidad, 2590 m, 7 August 1925, H. H. Knight (USNM); 2 males,

10 females, Stonewall, 2438 m, 28 August 1982, ex. *Quercus gambelii*, D. A. and J. T. Polhemus (JTP). **Montezuma Co.:** 1 male, Mesa Verde Nat. Pk., 13 July 1930, R. L. Usinger (UCB). NEW MEXICO. **Colfax Co.:** 1 male, 5 mi E Eagle's Nest, 21 July 1968, J. C. Schaffner (SHF); 1 male, Raton, 22 July 1928, A. A. Nichol (USNM). **Otero Co.:** 1 male, same data as holotype (AMNH). **San Miguel Co.:** 1 male, Sapello, 24 July 1950, ex. *Quercus* sp., R. H. Beamer (KU); 1 male, Sapello, 25 July 1950, H. O. Wright (KU). **Santa Fe Co.:** 1 male, Santa Fe Canyon, 21 May 1932 (USNM); 2 males, 2 females, Tesuque, 15 July 1932 (USNM).

DIAGNOSIS: *Phytocoris kiowa* is distinguished from other species of the *interspersus* group by the following combination of characters: hemelytra pale yellow, moderately to extensively mottled with red or reddish orange; vestiture of hemelytra without dark brown, simple setae; dorsal width of eye in males less than width of vertex; proximal fourth of hind tibiae with dark spots at spine bases; genital capsule of male with small tubercle above base of left paramere (fig. 95a); sensory lobe of left paramere strongly produced (fig. 95b), shaft broadly expanded distally (fig. 95c); sclerotized process of vesica with three strong serrations (fig. 95e).

DESCRIPTION: *Male.* Length 6.00–7.67, width 2.09–2.12; pale yellow general coloration with reddish markings. **Head:** width across eyes 0.94–1.01, vertex 0.39–0.40; white or pale yellow, lightly mottled with yellowish orange to pale brownish orange; jugum, lorum, buccula, tylus, and frons sometimes lightly marked with red. **Rostrum:** length 2.48–2.88, reaching fifth or sixth abdominal segment. **Antennae:** brownish yellow; I, length 1.24–1.44, set with long pale bristlelike setae, dorsal surface sometimes lightly marked with red; II, length 2.30–2.79; III, length 1.37–1.64; IV, length 1.04–1.17. **Pronotum:** mesal length 0.88–1.06, posterior width 1.51–1.84; disk pale yellow, moderately to extensively mottled or tinged with yellowish orange to pale brownish orange; collar and calli tinged with orange and sometimes with limited red markings; propleura pale, usually with light brownish orange across middle. **Scutellum:** strongly convex, abruptly deflexed apically; pale yellow with dark reddish spot either side

before apex and reddish line between spots; dorsal surface of scutellum more extensively marked with red in darker specimens. **Hemelytra:** opaque white, moderately to extensively mottled with red or reddish orange, sometimes also lightly tinged with yellowish brown; membrane pale with faint dusky patches. **Legs:** femora pale yellow, often becoming brownish yellow distally, marked with red particularly on apical half; tibiae pale yellow, front pair sometimes with several poorly defined dark annuli. **Vestiture:** dorsum with long, suberect, pale, simple setae and recumbent, silvery white, sericeous setae. **Genitalia:** Figure 95.

Female. Similar to male in color, vestiture, and structure. Length 6.16–6.37, width 2.03–2.16. **Head:** width across eyes 0.98–1.03, vertex 0.42–0.46. **Rostrum:** length 2.52–2.70, reaching fifth or sixth abdominal segment. **Antennae:** I, 1.26–1.42; II, 2.30–2.75; III, 1.39–1.60; IV, 1.06–1.17. **Pronotum:** mesal length 0.90–0.92, posterior width 1.57–1.66.

ETYMOLOGY: Named for the Kiowa Indians; a noun in apposition.

DISCUSSION: *Phytocoris kiowa* is distributed in Arizona, New Mexico, and Colorado. Specimens have been collected from *Quercus gambelii* in Arizona and southern Colorado. The period of occurrence is from May 21 to August 28.

Phytocoris navajo, new species

Figure 96

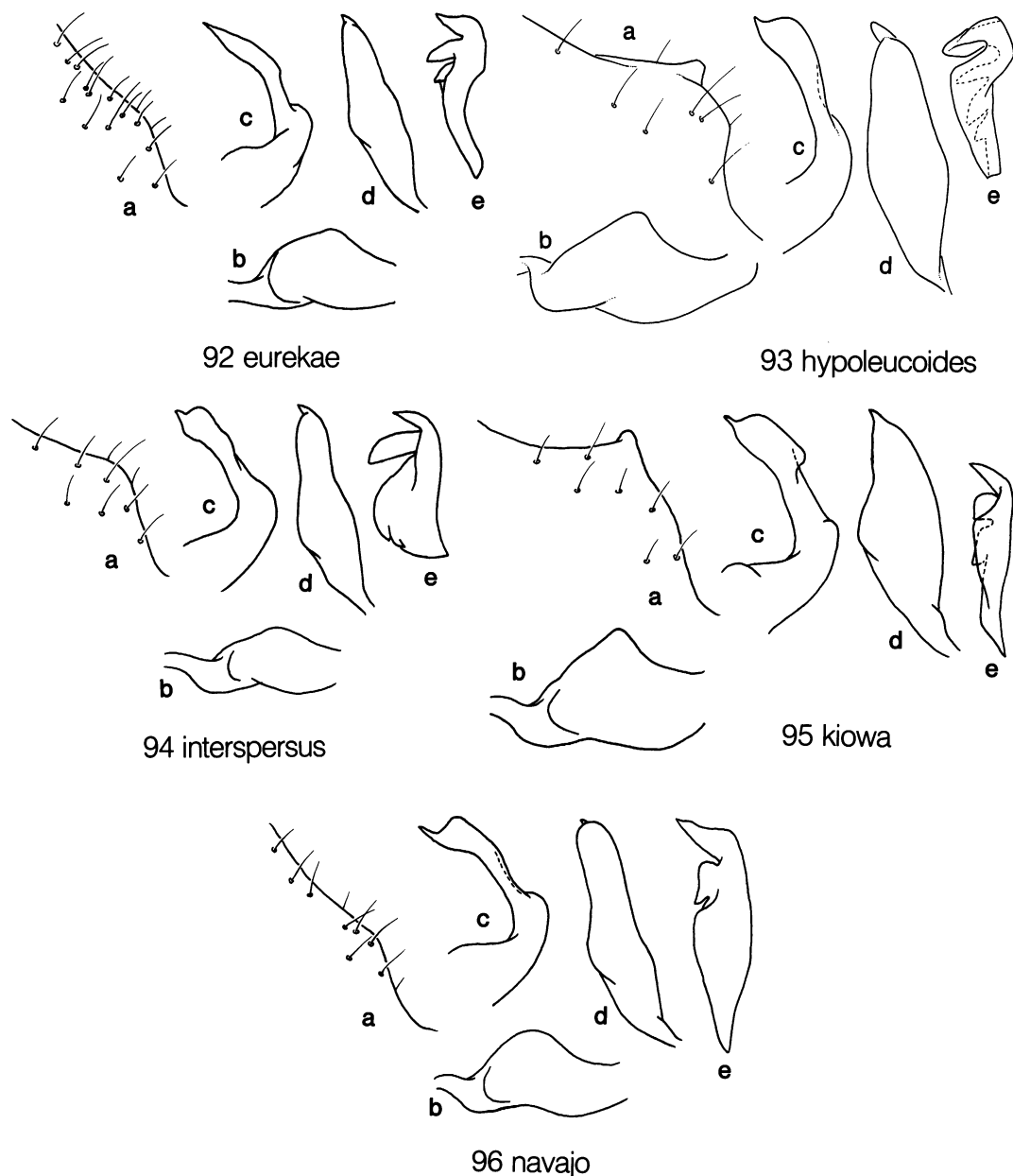
HOLOTYPE MALE: San Pedro Vista Pt., 2225 m, Santa Catalina Mts., Pima Co., Arizona, 12 June 1983, ex. *Quercus hypoleucoides* A. Camus, R. T. Schuh and M. D. Schwartz (AMNH).

PARATYPES: ARIZONA. **Cochise Co.:** Chiricahua Mts.: 2 males, 1 female, 8 July 1932, R. H. Beamer (KU, OSU); 1 female, near 8 July 1932, J. D. Beamer (KU); 1 male, 14 July 1938, L. W. Hepner (KU); 1 male, 1 female, 14 July 1938, R. H. Beamer (KU); 1 female, 3 July 1947, R. H. Beamer (KU); 2 males, 7 females, Onion Saddle, 2316 m, 29 May and 2 June 1982, ex. *Quercus arizonica* Sarg. and *Q. hypoleucoides*, B. Barientos (AMNH); 1 female, Onion Saddle, 30 June 1955, W. F. Barr (UID); 1 male, 3 females, near Portal, 1500–1700 m, 2–7 May 1978,

ex. *Quercus* sp., R. T. Schuh (AMNH); 1 female, 1.4 mi toward Rustler Pk. from Onion Saddle, 2400 m, 13 June 1980, ex. *Quercus arizonica*, R. T. Schuh, K. and R. Schmidt (AMNH); 9 females, 1.5 mi toward Portal from Onion Saddle, 2350 m, 13 June 1980, ex. *Quercus reticulata* Humb. & Bonpl., R. T. Schuh, K. and R. Schmidt (AMNH, OSU); 2 males, 1 female, Rd. from Portal to Rustler Pk., Chiricahua Mts., 2195 m, 2 June 1983, ex. *Quercus undulata* Torr., R. T. Schuh and G. M. Stonedahl (AMNH); 1 male, S. W. Rsrh. Stn., 5 mi W Portal, 1646 m, V. D. Roth (AMNH). **Coconino Co.:** 1 male, Flagstaff, 8 July 1967, taken at light, J. D. Johnson (NAU); 1 female, Todd's Lodge, Oak Crk. Cyn., 13 June 1941, G. H. and J. L. Sperry (AMNH). **Gila Co.:** 1 male, 3 females, 2 mi SE of Gila Co. line (4 mi NE of Strawberry) on Rt. 87, 1981 m, 15 June 1983, ex. *Quercus arizonica*, R. T. Schuh and M. D. Schwartz (AMNH). **Pima Co.:** 5 females, same data as holotype (AMNH); 1 female, Rincon Mts., 2134 m, 3 June 1926, A. A. Nichol (USNM); 1 male, San[ta] Cata[lina] Mt., 30 June 1930, E. D. Ball (USNM); 3 males, 11 females, Bear Cyn. Picnic Area, 1737 m, Santa Catalina Mts., 12 June 1983, ex. *Quercus oblongifolia* Torr., R. T. Schuh, M. D. Schwartz, and G. M. Stonedahl (AMNH). **Santa Cruz Co.:** 3 females, Santa Rita Mts., 2440–2740 m, 15 June 1924, ex. *Pinus strobiformis* Engelm., A. A. Nichol (UAZ, USNM); 1 male, Madera Cyn., Santa Rita Mts., 28 September 1962, taken at light, W. F. Barr (UID); 1 male, Santa Rita Mts., 10 June 1937, E. D. Ball (USNM).

DIAGNOSIS: This species is very similar to *eureka* and *kiowa* but differs by the fuscous apex of antennal segment II, and by the structure of the male genitalia. The shaft of the left paramere is abruptly expanded distally (fig. 96c) and the shaft of the right paramere (fig. 96d) is not distinctly tapered as in *eureka*. The sclerotized process of the vesica has two strong apical serrations (fig. 96e), whereas *eureka* has three apical teeth. *Phytocoris navajo* is distinguished from *hypoleucoides* and *interspersus* by the yellowish brown or pale reddish brown coloration, without green tinge or markings, and by the narrower vertex.

DESCRIPTION: *Male.* Length 6.10–7.07,



Figs. 92–96. Male genitalia of *interspersus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

width 2.16–2.29; yellowish brown to pale reddish brown general coloration. **Head:** width across eyes 1.02–1.11, vertex 0.28–0.33; pale yellow with red markings; frons and vertex lightly tinged with pale brownish orange, sometimes forming several inter-

secting lines; frons moderately convex, often with four or five poorly defined or incomplete, reddish striae. **Rostrum:** length 2.43–2.74, reaching fourth or fifth abdominal segment. **Antennae:** brownish yellow; I, length 1.15–1.40, lightly marked with red on dorsal

aspect; II, length 2.52–2.97, apex narrowly infuscated; III, length 1.30–1.51; IV, length 0.90–1.06. **Pronotum:** mesal length 0.79–0.95, posterior width 1.51–1.78; disk pale yellow, lightly to moderately tinged with brown, posterior submargin with 4–6 reddish brown to fuscous setose patches, extreme margin pale; collar and borders of calli marked with red; propleura pale, anterior margin with two, red to dark reddish brown fasciae. **Scutellum:** strongly convex, abruptly deflexed apically; pale yellow with round dark spot either side before apex; dorsal surface lightly to moderately sprinkled with red or reddish brown flecks especially above dark apical spots. **Hemelytra:** opaque white to pale grayish yellow, mottled with light brown to dusky patches, sometimes darker brown near apex of corium; clavus and corium often with faint pinkish tinge; cuneus and outer margin of corium distinctly marked with red, membrane moderately sprinkled with small fuscous spots. **Legs:** femora pale yellow, front and middle pair lightly marked with red mostly on apical third; hind femora more extensively reticulated with red or reddish brown, sometimes also with brown markings distally; tibiae pale, front and middle pair with three or four, often poorly defined, dark annuli; hind tibiae with red to reddish brown spots on dorsal aspect.

Vestiture: dorsum with suberect, golden, simple setae and recumbent, silvery white, sericeous setae; pronotum and hemelytra also with scattered, dark brown or black, simple setae, particularly at apex of clavus and on corium between anal ridge and radial vein. **Genitalia:** Figure 96.

Female. Similar to male in color, vestiture, and structure. Length 6.37–6.91, width 2.12–2.27. **Head:** width across eyes 1.02–1.04, vertex 0.38–0.40. **Rostrum:** length 2.61–2.95, reaching fifth or sixth abdominal segment. **Antennae:** I, 1.24–1.39; II, 2.43–2.88; III, 1.24–1.53; IV, 0.90–1.05. **Pronotum:** mesal length 0.90–0.99, posterior width 1.66–1.80.

ETYMOLOGY: Named for the Navajo Indians; a noun in apposition.

DISCUSSION: *Phytocoris navajo* is known from Cochise, Coconino, Pima, and Santa Cruz counties in Arizona. Adult specimens have been collected from several species of *Quercus* including *arizonica*, *hypoleucoides*, *oblongifolia*, *reticulata*, and *undulata*. Several specimens were taken on *Pinus strobiformis* in the Santa Rita Mts., but pine is probably not a true host plant of this species. Males have been taken at light. The period of occurrence is from May 2 to July 14 with the exception of one specimen collected in the Santa Rita Mts. on September 28.

JUNCEUS SPECIES-GROUP

DIAGNOSIS: Recognized by the large, elongate body form; short, elliptical head with large eyes (figs. 98, 99); dorsal surface, especially pronotum and scutellum, slightly shiny; vestiture without scalelike setae (fig. 100); and structure of the male genitalia, especially the elongate right paramere, large coarsely serrate sclerotized process of the vesica, and genital capsule usually with large, blunt tubercle above paramere bases.

DESCRIPTION: Large, 6.3–9.3, brown species with dark, simple setae and silvery white, sericeous setae; dorsum sometimes with limited narrow, black scalelike setae mostly restricted to pronotal disk and distal third of corium. **Head:** short in lateral view, elliptical, frons only slightly produced anteriorly of antennal fossae; antennae yellowish brown to fuscous, segments III and IV usually darker than segment II, frons weakly to moderately

convex, meeting tylus along shallow depression, broadly fuscous or with 6–8 dark striae laterally; eyes large, obovate. **Pronotum:** posterior submargin and lateral margins of pronotal disk usually narrowly to broadly fuscous, disk sometimes nearly entirely darkened; propleura broadly fuscous dorsally, except predominantly pale in *coniferalis* and *nigrifrons*, darkened dorsal region sometimes divided by pale line, apical third always pale. **Hemelytra:** grayish white or pale grayish yellow ground color with reddish brown to fuscous markings particularly along veins and inner apical region of corium, clavus and corium sometimes extensively darkened; membrane with scattered fuscous spots and patches, often extensively darkened inside areolar cells. **Legs:** femora white or pale yellow, reticulated or spotted with reddish brown to fuscous, sometimes nearly entirely darkened;

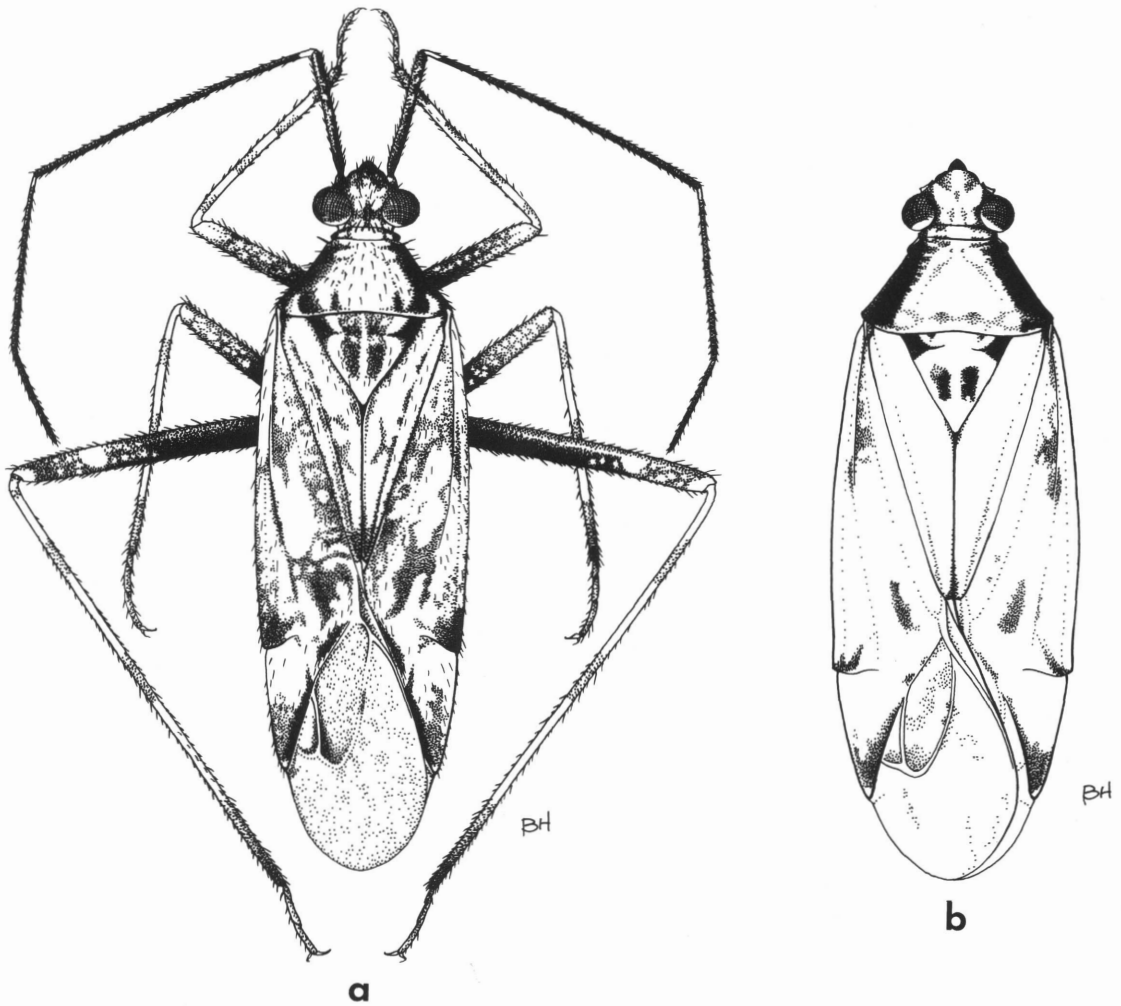


Fig. 97. *Phytocoris nobilis*. a. Dorsal habitus of male. b. Dorsal habitus of female.

hind femora sometimes with pale, preapical band; tibiae pale, sometimes with one to several dark annuli. **Male genitalia:** genital capsule, except *decurvatus*, *intermontanus*, *quercinus*, and *radiatae* with large, broadly rounded tubercle above paramere bases. *Left paramere:* sensory lobe weakly to moderately produced; upper surface of arm and base of shaft with small, blunt spines; outer surface of shaft usually with small, flattened protuberance basomedially; apex acute or narrowly rounded. *Right paramere:* elongate, usually with scattered small spines; shaft gradually tapered; or sometimes nearly parallel-sided and abruptly narrowed apically; apex acute.

Vesica: primary membranous sac with one or two large lobes, lobes sometimes with patches of spinulae or smaller accessory lobes; left basal lobe of vesica with small spinose patch above left margin of gonopore; basal process well sclerotized, sometimes slightly expanded apically; sclerotized process large, with 7–15 coarse serrations along one margin, depressed medially, base continuous with apex of basal process or joined by narrow membranous region (Note: *coniferalis* has two nonserrate sclerotized processes).

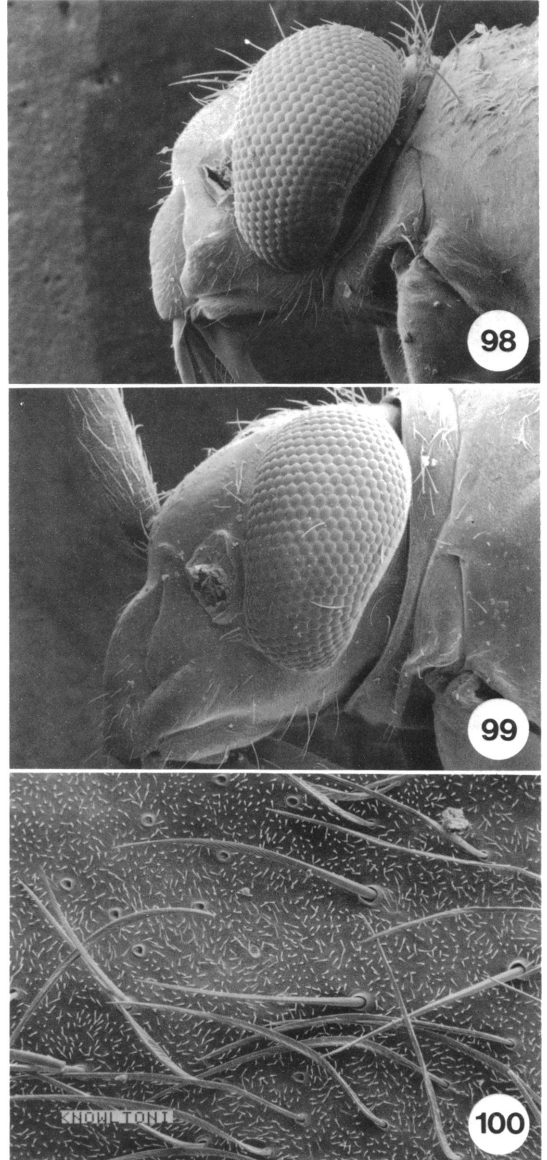
DISCUSSION: The *juncus* group was established by Knight (1974) who presented a key, descriptions, and figures of the male genital

parameres for *junceus* Knight and 15 new species. Since then, four additional species have been described (Henry, 1974, 1979; Kelton, 1979, Stonedahl, 1984) and one synonymy has been proposed (Henry, 1982). Kelton (1979) also recognized *fenestratus* Reuter and *nigrifrons* Van Duzee as members of this group.

The *junceus* group has a transcontinental distribution primarily in southern Canada and the northern United States. Eight species are distributed in eastern North America and 16 are restricted to western North America. One additional species, *dreisbachi*, occurs on both sides of the Rocky Mts. In the west, *junceus* group species are distributed primarily in forested regions where they inhabit coniferous trees, predominantly *Abies* and *Pinus*. Exceptions are *tricinctipes*, which occurs in the Intermountain Sagebrush region of Nevada and eastern California on pinyon pine; the related species, *decurvatus*, *quercinus*, and *intermontanus*, which are distributed in southwestern states on *Quercus*; and *cowaniae*, which occurs on *Cowania* in southeastern California, southern Nevada, and western Arizona. Several other species of the *junceus* group are distributed as far south as the San Bernardino Mts. in California and the northern mountain ranges of New Mexico.

Only the western species of the *junceus* group are treated in this study. Seventeen species are recognized from this region, including seven previously placed taxa (i.e., *alpinus*, *dentatus*, *dreisbachi*, *knowltoni*, *nigrifrons*, *nobilis*, *rainieri*), three species identified here as belonging to the group (i.e., *decurvatus*, *tricinctipes*, *yollabollae*), and seven new species (i.e., *argus*, *coniferalis*, *cowaniae*, *intermontanus*, *quercinus*, *radiatae*, *usingeri*). The following taxa are proposed as new junior synonyms: *abiesi*, *albertae*, *albiclavus*, *elongatus*, *montanae*, *taos*, and *tehamae*.

The genitalic structures of *junceus* group males are highly uniform, with the exception of *coniferalis*, which has atypical parameres and the vesica with two nonserrate sclerotized processes, and four species (i.e., *decurvatus*, *intermontanus*, *quercinus*, *radiatae*), which possess underdeveloped tubercles on the genital capsule above the paramere bases, and the shaft of the left paramere without a



Figs. 98–100. *Junceus* group species. 98. *intermontanus*, lateral view of head. 99. *yollabollae*, lateral view of head. 100. *knowltoni*, dorsal vestiture.

flattened, medial protuberance on the outer surface. The latter four species are included in the *junceus* group because they possess the elongate right paramere, coarsely serrate sclerotized process of the vesica, and the bulbous, spinose patch on the left basal lobe of the vesica, which are diagnostic for the group.

Phytocoris coniferalis, although lacking most of the diagnostic genitalic features of *junceus* species, is included in the group on the basis of its similar external appearance, especially head structure, dorsal vestiture, and coloration, and its association with conifers.

The male genitalia of *junceus* group species suggests a relationship with members of the *listi* and *plenus* groups. The members of all these groups are characterized by the large, blunt tubercles above the paramere bases and the vesica with a well-developed primary membranous sac and a single, coarsely serrate sclerotized process, which is broadly attached along the inner margin to the primary sac. Externally, *junceus* group species resemble species of the *stellatus* and *interspersus* groups with short, elliptical head and dorsal vestiture lacking scalelike setae. However, representatives of the latter two groups are generally smaller, the genital capsule is without, or with very small, protuberances above the paramere bases, and the sclerotized process of the vesica, although broadly attached, has many fewer serrations mostly restricted to the distal half of the process.

KEY TO SPECIES OF THE *JUNCEUS* GROUP

- 1

Propleura mostly pale, dorsal half with one or two red to fuscous line(s) 2

Propleura mostly brown or fuscous, ventral fourth to one-third and sometimes narrow median line or anteromedial mark pale 3
- 2(1)

Antennal segment II dark brown or black, sometimes yellowish brown medially; frons pale, sometimes lightly marked with red or reddish brown; front tibiae with three dark annuli; length 6.3–7.2 *coniferalis* n. sp.

Antennal segment II yellow or brownish yellow, apical fourth brown; frons extensively infuscated, sometimes nearly entirely darkened; front tibiae with a single dark annulus apically; length 7.3–8.5 *nigrifrons* Van D.
- 3(1)

Genital capsule of male with well developed tubercle above base of left paramere (tubercle broad and weakly elevated for *argus* and *knowltoni*); shaft of left paramere usually with small, flattened protuberance on outer basal margin (figs. 108c, 109c) 4

Genital capsule of male lacking distinct

- tubercle above base of left paramere; shaft of left paramere without basal protuberance (figs. 105c, 112c) 14
- 4(3)

Posterior lobe of pronotal disk uniformly brown or fuscous, except posterior margin sometimes narrowly pale 5

Posterior lobe of pronotal disk with at least narrow region behind each callus pale, usually more broadly pale medially 7
- 5(4)

Wing membrane smoky with limited, weakly contrasting pale areas; dorsal width of eye of male equal to or less than width of vertex *alpinus* Kelton

Wing membrane pale, moderately to extensively darkened with strongly contrasting fuscous markings; dorsal width of eye of male greater than width of vertex 6
- 6(5)

Antennal segment I with numerous pale bristlelike setae, length of setae greater than segment width; left genital tubercle of male broadly rounded (fig. 102a); shaft of left paramere without basal protuberance (fig. 102c) *argus* n. sp.

Antennal segment I with several dark bristlelike setae, length of setae less than segment width; left genital tubercle of male cylindrical (fig. 113a); shaft of left paramere with strongly produced, rounded, basal protuberance (fig. 113c) *tricinctipes* Knight
- 7(4)

Posterior submargin of pronotal disk broadly pale medially, without fuscous markings 8

Posterior submargin of pronotal disk narrowly to broadly fuscous, or marked with fuscous patches, extreme margin pale 9
- 8(7)

Lateral margins of pronotal disk broadly fuscous; hind femora mostly fuscous, limited spots and oblique preapical band white *nobilis* Stonedahl

Lateral margins of pronotal disk narrowly fuscous; hind femora pale yellow with reticulate pattern of reddish brown or dark brown *rainieri* Knight
- 9(7)

Ratio of length of antennal segment I to width of head across eyes from 1.15:1 to 1.40:1, or slightly less than 1.15:1 for some males; clavus mostly pale, vein and inner margin bordering scutellum reddish brown to fuscous 10

Ratio of length of antennal segment I to width of head across eyes less than 1.15:1; clavus moderately to extensively darkened with reddish brown to fuscous 11

- 10(9) Antennal segment I with numerous erect bristlelike setae dorsally, length of setae equal to or greater than width of segment; male unknown *rainieri* Knight
- Antennal segment I with short recumbent setae only, length of setae less than segment width; male genitalia as in figure 115 *yollabollae* Bliven
- 11(9) Sclerotized process of vesica with 8–10 strong serrations; spinose region on left basal lobe of vesica small, rounded 12
- Sclerotized process of vesica with 12–15 serrations, spinose region on left basal lobe of vesica large, elongate 13
- 12(11) Posterior submargin of pronotal disk broadly and uniformly darkened; left genital tubercle of male broad, weakly elevated (fig. 108a); length 7.3–9.3 *knowltoni* Knight
- Posterior submargin of pronotal disk with fuscous markings, but not uniformly darkened; left genital tubercle of male strongly produced (fig. 104a); length 5.3–7.1 *cowaniae* n. sp.
- 13(11) Left genital tubercle small, narrowly rounded or truncate apically (fig. 106a); shaft of left paramere broadly notched basally (fig. 106c); basal and distal serrations of sclerotized process equally large (fig. 106e) *dreisbachi* Knight
- Left genital tubercle large and broadly rounded (fig. 114a); shaft of left paramere without broad notch basally (fig. 114c); basal serrations of sclerotized process smaller than distal serrations (fig. 114e) *usingeri* n. sp.
- 14(3) Dorsal two-thirds of propleuron brown or yellowish brown, sometimes faintly tinged with red; sensory lobe of left paramere strongly produced (fig. 112b) *radiatae* n. sp.
- Dorsal two-thirds to four-fifths of propleuron shiny fuscous; sensory lobe of left paramere weakly produced (figs. 105b, 107b, 111b) 15
- 15(14) Sclerotized process of vesica lacking serrations medially (fig. 105e); right paramere with broadly rounded dorsal margin, abruptly narrowed distally (fig. 105d) *decurvatus* Knight
- Sclerotized process of vesica with serrations along entire margin; right paramere with dorsal margin straight or slightly concave, gradually narrowed distally (figs. 107d, 111d) 16
- 16(15) Apices of front tibiae narrowly pale; sclerotized process with 13 or 14 serrations

(fig. 111e); shaft of left paramere broad (fig. 111c) *quercinus* n. sp.

Apices of front tibiae dark; sclerotized process with seven or eight serrations (fig. 107e); shaft of left paramere narrow (fig. 107c) *intermontanus* n. sp.

Phytocoris alpinus Kelton

Figure 101

Phytocoris alpinus Kelton, 1979: 689, 690, figs. 3–6; 1980: 173, 174, figs. 123, 135, map 52.

TYPES: *Phytocoris alpinus* was described from five male specimens collected at Lake Louise, Alberta, Canada, 3 August 1970, ex. *Pinus contorta* Dougl., L. A. Kelton. The holotype (no. 15524) and all four paratypes are deposited in the Canadian National Collection, Ottawa, Canada.

DIAGNOSIS: Length 8.6–9.0. *Phytocoris alpinus* is distinguished from other western species of the *junceus* group by the uniformly dark brown pronotal disk; fuscous first antennal segment with limited pale spots on dorsal aspect; and structure of the male genitalia (fig. 101). Externally, this species closely resembles *knowltoni* but differs by the uniformly darkened pronotal disk, more extensively darkened first antennal segment, narrower left genital tubercle of the male (fig. 101a), long right paramere (fig. 101d), and greater number of serrations (12–14) on the sclerotized process of the vesica (fig. 101e).

DISCUSSION: *Phytocoris alpinus* is known only from western Alberta, Canada, where it occurs on *Pinus contorta*. However, it may extend into the northern Rocky Mts. of the United States where *Pinus contorta* is frequently encountered at higher elevations.

Phytocoris argus, new species

Figure 102

HOLOTYPE MALE: Argus Mts. Inyo Co., California, "May 91 K.", ex. *Pinus monophylla* Torr. & Frem. (USNM).

PARATYPES: CALIFORNIA. **Ventura Co.:** 1 male, Chuchupate Rgr. Stn., base Frazier Mt., 5 May 1959, at light, J. Powell (UCB).

DIAGNOSIS: Recognized by the uniformly darkened posterior lobe of the pronotal disk, narrow vertex, antennal segment I with numerous pale bristlelike setae, wing membrane pale with strongly contrasting fuscous mark-

ings, and genital capsule of male with broadly rounded tubercle above base of left paramere (fig. 102a).

DESCRIPTION: *Male.* Length 7.58–7.68, width 2.50–2.60; dark brown general coloration with limited pale markings. **Head:** width across eyes 1.21–1.22, vertex 0.35–0.36; pale brownish yellow, extensively marked with fuscous; frons weakly convex, meeting tylus along broad, shallow depression; eyes large, occupying approximately five-sixths of head height. **Rostrum:** length 2.85–3.08, reaching slightly beyond apices of hind coxae. **Antennae:** I, length 1.24, dark brown, with pale spots and pale bristlelike setae dorsally and laterally; II, length 2.65, dark brown; III, broken, dark brown; IV, missing. **Pronotum:** mesal length 0.98–1.01, posterior width 1.91–1.95; disk dark brown, posterior margin narrowly pale; collar and calli with limited pale markings; propleura dark brown, apical fourth pale. **Scutellum:** dark brown, apex and anterolateral angles pale. **Hemelytra:** creamy white, extensively darkened with brown and fuscous, but leaving spots and larger patches of pale mostly on inner margin of clavus, outer half and apex of corium, and on cuneus; membrane densely conspurcate, with large pale mark behind areolar cells and apex of cuneus, veins darkened, pale apically. **Legs:** femora creamy white or pale brownish yellow with brown or dark brown reticulate markings, dark regions especially distally broken by pale spots; tibiae pale with four or five dark annuli; tarsi brown or dark brown. **Vestiture:** dorsum with dark brown simple setae, silvery white, sericeous setae, and sparsely distributed, narrow, dark brown scalelike setae. **Genitalia:** Figure 102.

Female. Unknown.

ETYMOLOGY: Named for the type locality; a noun in apposition.

DISCUSSION: This species is known only from the holotype and single paratype collected in southern California. The type was collected on *Pinus monophylla* Torr. & Frem., and the paratype was taken at light. The female is not known.

Phytocoris argus closely resembles *tricinctipes*, which also inhabits *Pinus monophylla*, but differs by the pale bristlelike setae on antennal segment I, and structure of the male

genitalia, especially the broadly rounded left genital tubercle (fig. 102a).

***Phytocoris confiferalis*, new species**

Figure 103

HOLOTYPE MALE (ANTENNAE MISSING): Mill Crk., San Bernardino Mts., San Bernardino Co., California, 1830 m, 19 July 1941, ex. *Abies concolor* (Gord. & Glend.) Lindl., Timberlake (UCR; donated to the AMNH).

PARATYPES: CALIFORNIA. Riverside Co.: San Jacinto Mts.: 1 male, 21 July 1929, L. D. Anderson (KU); 1 female, T. R. Haig (UCB) and 1 male, F. X. Williams (CAS), Idyllwild, 6 July 1950; 1 male, 19 June 1937 and 1 male, 16 June 1939, Tahquitz Valley, J. G. Shanafelt (LACM). **San Bernardino Co.:** San Bernardino Mts.: 1 female, Barton Flats, 11 July 1956, J. I. Stage (CAS); same data as holotype: 1 male, 3 females, 19 July 1941 (UCR); 2 males, 7 females, 20 July 1941 (UCR); 2 females, 9 August 1941 (UCR); 1 female, 26 August 1944 (UCR); 1 female, 3 September 1944, (UCR); 1 female, 13 August 1945 (OSU); 1 male, 3 July 1949 (OSU); 1 female, 2 July 1950 (UCR). **San Diego Co.:** 1 female, Mt. Palomar, 18 July 1963, J. Powell (UCB).

DIAGNOSIS: *Phytocoris confiferalis* is distinguished from other species of the *junceus* group by the following combination of characters: lateral margins of pronotal disk mostly pale; propleura pale with two red or reddish brown stripes crossing dorsal half; second antennal segment dark brown or black, usually lighter yellowish brown medially; frons mostly pale with limited red or reddish brown markings; front tibiae with three dark annuli; and structure of the male genitalia (fig. 103).

DESCRIPTION: *Male.* Length 6.48–7.42, width 2.14–2.21; grayish yellow ground color with reddish brown to fuscous markings. **Head:** width across eyes 1.03–1.07, vertex 0.42–0.45; base and middle of tylus, jugum, lorum, and buccula marked with reddish brown or fuscous; frons often lightly marked with red or reddish brown, but lacking distinct striae. **Rostrum:** length 3.34–3.65, reaching seventh or eighth abdominal segment. **Antennae:** dark brown or black; I, length 1.37–1.55, dorsal surface with pale

spots and 8–12 erect bristlelike setae, ventral surface mostly pale; II, length 3.38–3.46, usually yellowish brown medially; III, length 1.67–2.03; IV, length 1.01–1.10. **Pronotum:** mesal length 0.97–1.08, posterior width 1.69–1.84; disk pale grayish yellow, sometimes lightly tinged with red; posterior submargin of disk with transverse fuscous line, extreme posterior margin narrowly pale; collar brown to fuscous with pale spot medially and at each lateral angle; calli with red to fuscous markings; propleura pale with two red or reddish brown stripes crossing dorsal half. **Scutellum:** pale yellow, sometimes lightly tinged with red; darker specimens with fuscous medial patch at base and brown markings before apex. **Hemelytra:** grayish white or pale grayish yellow with brown to fuscous markings, sometimes lightly tinged with red; middle and apex of corium with large pale mark; cuneus pale, usually tinged with red, apical third to one-half fuscous; membrane moderately to densely mottled with fuscous. **Legs:** femora pale yellow with reddish brown to fuscous markings, dark patches often broken by pale spots; hind femora with irregular pale band before apex; tibiae pale with fuscous markings, front pair with three dark annuli. **Vestiture:** dorsum with dark, simple setae, narrow, black, scalelike setae and silvery white, sericeous setae. **Genitalia:** Figure 103.

Female. Similar to male in color, vestiture, and structure. Length 6.26–7.13, width 2.20–2.39. **Head:** width across eyes 1.06–1.14, vertex 0.47–0.51. **Rostrum:** length 3.51–3.74, reaching seventh or eighth abdominal segment. **Antennae:** I, 1.45–1.75; II, 3.56–3.94; III, 2.32–2.48; IV, 1.22–1.31. **Pronotum:** mesal length 0.90–1.08, posterior width 1.57–1.74.

ETYMOLOGY: Named for its occurrence on a coniferous host plant.

DISCUSSION: *Phytocoris coniferalis* is known only from the type material collected in southern California. Most of these specimens were taken in the San Bernardino Mts. on *Abies concolor*, but several individuals were collected as far south as Mt. Palomar in San Diego County.

With the exception of the large tubercles above the paramere bases, the male genital structures of *coniferalis* are not typical of the

junceus group. However, the external morphology and host association of this species strongly supports its placement here.

Phytocoris cowaniae, new species

Figure 104

HOLOTYPE MALE: Hualapai Mts., SE of Kingman, T20N R15W, 1220–1950 m, Mohave Co., Arizona, 9–10 June 1983, ex. *Cowania mexicana* D. Don, R. T. Schuh, M. D. Schwartz, and G. M. Stonedahl (AMNH).

PARATYPES: ARIZONA. **Coconino Co.:** 1 female, Grand Canyon, S Rim, 24 June 1930, R. L. Usinger (USNM). **Mohave Co.:** 1 female, same data as holotype (AMNH). **Yavapai Co.:** 1 male, 3 females, Ash Fork, 23 May 1927, J. O. Martin (CAS); 6 females, 2 mi S Jct. Rt. 89A on Rt. 89, 4 June 1983, ex. *Cowania mexicana*, G. M. Stonedahl (AMNH). CALIFORNIA. **Riverside Co.:** 1 male, Pinon Flat, San Jacinto Mts., 13 May 1939, E. S. Ross (UCB). **San Bernardino Co.:** 2 females, Providence Mts. St. Rec. Area, 1310 m, 18 May 1982, ex. *Cowania mexicana*, M. D. Schwartz (AMNH). COLORADO. **Mesa Co.:** 3 males, 3 females, lower end of Rabbit Valley, SW of Mack, 15 May 1983, ex. *Cowania mexicana*, J. T. and D. A. Polhemus (JTP). NEVADA. **Clark Co.:** 1 male, Charleston Peak, 1981 m, 22 July 1982, at store lights, J. T. Polhemus (JTP). **Mineral Co.:** 1 male, 9 females, 27 mi SW of Hawthorne on Rt. 359 (1 mi NE of Anchorite Summit), 2256 m, 2 July 1983, ex. *Purshia glandulosa* Curran, R. T. Schuh and M. D. Schwartz (AMNH). **Nye Co.:** 4 females, 1 mi NE Belmont on Rt. 82, 2281 m, 13 July 1980, ex. *Cowania mexicana*, R. T. Schuh and G. M. Stonedahl (AMNH); 1 female, Nevada Atomic Test Site, 2 mi W Tippapah Hwy. on Mine Mt. Rd. (A6), 1341 m, 7 June 1983, ex. *Cowania mexicana*, R. T. Schuh, M. D. Schwartz, and G. M. Stonedahl (AMNH); 1 female, *ibid.*, except 1.5 mi W of Area 12 Camp on Stockade Wash Rd. (AMNH).

DIAGNOSIS: Recognized by the short first antennal segment (see couplet 9 of key); posterior submargin of pronotal disk with series of rarely continuous, fuscous patches; clavus with large fuscous markings, vein pale; left genital tubercle of male strongly elevated (fig.

104a); and sclerotized process of vesica with 8–10 strong serrations (fig. 104e).

DESCRIPTION: *Male*. Length 6.10–7.10, width 1.92–2.27; grayish white ground color with brown to fuscous markings. **Head:** width across eyes 0.99–1.07, vertex 0.36–0.39; creamy white or pale brownish yellow with fuscous markings; frons moderately produced, meeting tylus along broad, shallow depression, marked with five or six dark striae laterally; eyes occupying three-fourths of head height or slightly less; antennal fossa inserted slightly below middle of eye. **Rostrum:** length 2.46–2.88, reaching fourth or fifth abdominal segment. **Antennae:** I, length 1.00–1.20, creamy white, marked with fuscous maculae dorsally and laterally, ventral surface mostly pale; II, length 2.16–2.85, brown or yellowish brown; III, length 1.12–1.40, brown or dark brown; IV, length 0.81–0.91, brown or dark brown. **Pronotum:** mesal length 0.86–1.00, posterior width 1.54–1.76; disk creamy white or grayish white, lightly tinged with brown, lateral margins and posterior submargin usually more extensively darkened with fuscous, extreme posterior margin narrowly pale; collar and calli lightly marked with brown or fuscous; propleura mostly fuscous, apical third and median stripe or anteromedial ray pale. **Scutellum:** mostly fuscous, apex and anterolateral angles broadly pale, sometimes with pale median line reaching onto mesoscutum. **Hemelytra:** creamy white or grayish white, variously marked with brown or dark brown especially on outer half of clavus, inner margin and posterolateral angle of corium, embolium, and inner margin and apex of cuneus; inner-medial region of clavus, and corium between anal ridge and radial vein usually with large elongate fuscous mark; membrane pale with spots and larger maculae of brown or fuscous, especially inside cells; outer margin of membrane with fuscous patch bordering apex of cuneus, and larger tapered fuscous mark reaching from apex of membrane to posterior margin of small cell. **Legs:** femora white or pale yellow with fuscous, reticulate markings mostly on distal half; distal fourth of hind femora extensively darkened and marked with pale spots; tibiae pale with three or four dark annuli, dark bands on middle and hind tibiae somewhat obscured; tarsi brown or dark brown. **Vestiture:** dorsum

with dark simple setae and silvery white, sericeous setae; sometimes also with scattered, narrow, black scalelike setae mostly on dark distal markings of corium. **Genitalia:** Figure 104.

Female. Similar to male in color, vestiture, and structure, except wing membrane usually slightly shorter. Length 5.30–6.05, width 1.88–2.04. **Head:** width across eyes 0.95–1.02, vertex 0.39–0.42. **Rostrum:** length 2.41–2.54, reaching fifth or sixth abdominal segment. **Antennae:** I, 0.98–1.10; II, 2.12–2.31; III, 1.11–1.22; IV, 0.76–0.88. **Pronotum:** mesal length 0.82–0.90, posterior width 1.46–1.66.

ETYMOLOGY: Named for the genus of its host plant, *Cowania mexicana* D. Don.

DISCUSSION: *Phytocoris cownianae* has been collected in southeastern California, southern Nevada, and western Arizona mostly at elevations between 1200 and 2200 m. A series of specimens also was collected in Mesa Co., Colorado. The host plant of this species is *Cowania mexicana*. A series of specimens also was taken on *Purshia glandulosa* in Mineral Co., Nevada. Collection dates are from May 13 to July 22.

Phytocoris decurvatus Knight

Figure 105

Phytocoris decurvatus Knight, 1968: 226, fig. 273.

TYPES: Described from a single male collected in Area 12M, Nevada Test Site, Nye Co., Nevada, 9 August 1965, taken at light, J. M. Merino. This specimen is deposited in the Knight Collection (USNM).

DIAGNOSIS: Length 5.3–6.6. This species is distinguished from other members of the *juncus* group by the narrowly pale apices of the front tibiae and structure of the male genitalia, especially the broad right paramere with abruptly narrowed distal region (fig. 105d), and genital capsule without tubercle above base of left paramere (fig. 105a). The sclerotized process of the vesica lacks serrations medially (fig. 105e).

Phytocoris decurvatus is superficially similar to several species not belonging to the *juncus* group (e.g., *tenuis*, *neglectus*, *omani*), but is easily separated from these taxa by the structure of the male genitalia and the external characters provided in the key to the species-groups.

DISCUSSION: *Phytocoris decurvatus* is widely distributed in the southwestern United States: Weber Co., Utah; east to El Paso Co., Colorado and Lincoln Co., New Mexico; and south to the Chiricahua Mts. in Arizona. The westernmost record is the holotype from Nye Co., Nevada. I have examined several hundred specimens with collection dates from May 2 to October 7. Adults have been collected on *Quercus gambelii* Nutt. and *Q. turbinella* Greene. Several males have been taken at light.

Phytocoris dentatus Knight

Phytocoris dentatus Knight, 1974: 125, fig. 2.

TYPES: Described from a single male collected in British Columbia, 10 July 1941 by F. J. Survey. The holotype is retained in the Knight Collection (USNM).

DISCUSSION: I have been unable to examine the unique type of *dentatus* and therefore, cannot satisfactorily differentiate this species from other members of the *junceus* group. According to Knight (1974), *dentatus* is distinguished from other species of the group by the male genital structures, in particular the dentate projections on the dorsal surface of the left paramere and the small, sharp tubercle above the base of the right paramere. Based on external characters, *dentatus* runs to the same couplet as *dreisbachi* in Knight's (1974) key to species.

No specimens examined in this study fit Knight's description and genitalic illustrations of *dentatus*. Considering the type locality, it is remotely possible that the *dentatus* type is a male specimen of *rainieri*, a species described from Mt. Rainier, Washington, and known only from the female.

Phytocoris dreisbachi Knight

Figure 106

Phytocoris dreisbachi Knight, 1974: 125, 126, fig. 3. – Henry, 1982: 337.

Phytocoris discoidalis Henry, 1974: 187–190, figs. 1–4; 1979: 9, figs. 7, 12. – Kelton, 1979: 689. – Henry, 1982: 337 (syn.).

TYPES: *Phytocoris dreisbachi* was described from two males taken in Kalkaska County, Michigan, 2 July 1960, R. K. Dreisbach. Both specimens are deposited in the Knight Collection (USNM).

The junior synonym, *discoidalis*, was described from 17 specimens collected in Michigan, Pennsylvania, and Wisconsin. The male holotype was taken 8 mi E of Blue Mt. exit on Turnpike, Cumberland Co., Pennsylvania, 5 June 1973, ex. *Pinus virginiana* Mill., T. J. Henry and A. G. Wheeler, Jr. The holotype (no. 73350), allotype, and five male paratypes are deposited in the collection of the Pennsylvania Department of Agriculture; and one female paratype is in the author's collection.

DIAGNOSIS: Length 6.9–8.2. This species closely resembles *usingeri* but is distinguished by the smaller, narrowly rounded or truncate left genital tubercle (fig. 106a); shaft base of left paramere broadly notched (fig. 106c); and sclerotized process with equally large basal and distal serrations (fig. 106e).

DISCUSSION: *Phytocoris dreisbachi* is widely distributed in Michigan, Pennsylvania, and Wisconsin, where it occurs on *Pinus virginiana* Mill. It was recently collected in Benewah Co., Idaho, on *P. contorta* Dougl., suggesting that *dreisbachi* has a transcontinental distribution in the northern United States and southern Canada. Kelton (1980) reported this species from the southeastern corner of Manitoba on *P. banksiana* Lamb. and from Alberta on *P. contorta*. These three *Pinus* species are closely related and form a more or less continuous belt across the northern United States, southern Canada, and down the east and west coasts.

I have examined 25 specimens of *dreisbachi* from Idaho, all collected on August 8, 1979. The period of occurrence in the eastern United States is from May 18 to July 8.

Phytocoris intermontanus, new species

Figures 98, 107

HOLOTYPE MALE: Dock Flat, 1 mi NE of St. Rt. 40, T2S R12W Sec. 9, 2438 m, Wasatch Co., Utah, 14 August 1982, ex. *Quercus gambelii* Nutt., M. D. Schwartz (AMNH).

PARATYPES: ARIZONA. **Mohave Co.:** 5 females, Hualapai Mts., SE of Kingman, T20N R15W, 1220–1830 m, 9–10 June 1983, ex. *Quercus gambelii*, R. T. Schuh, M. D. Schwartz, and G. M. Stonedahl (AMNH). **Pima Co.:** 5 males, 5 females, Bear Cyn. Picnic Area, Santa Catalina Mts., 1737 m, 12 June

1983, ex. *Quercus oblongifolia* Torr., R. T. Schuh, M. D. Schwartz, and G. M. Stonedahl (AMNH). NEVADA. **White Pine Co.:** 1 male, 1 female, Lehman Crk. Cmpgd., Humboldt Nat. For., 2322 m, 14 July 1980, ex. *Cercocarpus ledifolius* Nutt., G. M. Stonedahl (OSU); 6 females, same data as above except 2286 m, 12 August 1980 (OSU); 1 female, 8.3 mi N US Hwy. 50 on Steptoe Crk. Rd., 2310 m, 19 July 1980, ex. *Cercocarpus ledifolius*, G. M. Stonedahl (OSU). UTAH. **Sevier Co.:** 3 females, 2.3 mi N Int. 70 on Rd. to Kanosh, 2128 m, 16 July 1980, ex. *Cercocarpus ledifolius*, G. M. Stonedahl (AMNH). **Wasatch Co.:** 6 females, same data as holotype (AMNH).

DIAGNOSIS: Similar to *decurvatus* and *quercinus*, but distinguished by the usually larger body size, 6.20–8.05; dark apices of the front tibiae; and structure of the male genitalia, particularly the sclerotized process of vesica with seven or eight large curved serrations (fig. 107e), and the long narrow right paramere (fig. 107d). *Phytocoris intermontanus* is easily distinguished from other *junceus* group species by the gradually sloping left margin of the genital capsule, without prominent tubercle above base of left paramere (fig. 107a).

DESCRIPTION: *Male.* Length 6.20–8.05, width 1.95–2.50; brown or dark brown general coloration. **Head:** width across eyes 1.08–1.21, vertex 0.27–0.29; creamy white or brownish yellow, moderately to extensively marked with brown or dark brown; frons weakly convex, scarcely protruding beyond antennal fossae, meeting tylus along broad shallow depression; frons usually with 6–8 dark striae laterally; eyes large, occupying nearly entire height of head. **Rostrum:** length 2.50–3.18, reaching between fourth and sixth abdominal segments. **Antennae:** I, length 1.04–1.50, pale with large brown or fuscous markings and scattered pale bristlelike setae dorsally and laterally, ventral surface mostly pale except with fuscous stripe basally; II, length 2.62–3.50, brown or dark brown, sometimes yellowish brown medially or rarely with pale median band; III, length 1.31–1.78, dark brown, narrowly pale at base and apex; IV, length 0.98–1.17, dark brown. **Pronotum:** mesal length 0.89–1.12, posterior width 1.51–1.96; disk grayish white or pale

brownish yellow, moderately to extensively marked and tinged with brown or dark brown, sometimes nearly entirely darkened; lighter specimens with dark markings mostly confined to posterior submargin of disk and area behind calli; collar and calli variously darkened; propleura fuscous, apical fourth pale. **Scutellum:** pale with scattered brown or dark brown markings; usually with dark fascia either side of apex extending anteriorly to near middle of disk; some specimens more extensively darkened dorsally either side of pale midline, sometimes with only apex and anterolateral angles broadly pale. **Hemelytra:** grayish white or pale brownish yellow, moderately to extensively mottled with brown or fuscous, sometimes nearly entirely darkened; corium usually with large angulate mark between anal ridge and radial vein; inner margin of cuneus mostly fuscous; membrane moderately to densely conspurcate, spots often coalescing into larger fuscous patches, veins dark, pale distally. **Legs:** femora creamy white or pale yellow with brown to fuscous markings mostly on distal half, hind pair usually more extensively darkened with dark patches broken by pale spots; tibiae pale with fuscous markings, front and middle pairs with three broad dark annuli; tarsi yellowish brown to dark brown. **Vestiture:** dorsum with dark simple setae, silvery white, sericeous setae, and scattered, narrow, dark brown or black, scalelike setae, the latter type mostly restricted to darkened regions of corium. **Genitalia:** Figure 107.

Female. Similar to male in color, vestiture, and structure. Length 6.25–7.60, width 2.15–2.42. **Head:** width across eyes 1.09–1.16, vertex 0.36–0.39. **Rostrum:** length 3.00–3.30, reaching base of ovipositor or slightly beyond. **Antennae:** I, 1.44–1.64; II, 3.12–3.42; III, 1.74–1.88; IV, 1.04–1.29. **Pronotum:** mesal length 0.92–1.01, posterior width 1.72–1.88.

ETYMOLOGY: From the Latin, *inter* (among) and *montanus* (of mountains), referring to its occurrence in mountainous regions.

DISCUSSION: This species is distributed in mountainous regions of Arizona, Colorado, Utah, and eastern Nevada, mostly at elevations of 1500–2500 m. Adults have been collected on *Cercocarpus ledifolius* Nutt., *Quer-*

cus gambelii Nutt., and *Q. oblongifolia* Torr. Collection dates are from May 12 to August 28. Males are attracted to light.

ADDITIONAL SPECIMENS: Nineteen specimens were examined from the following localities: **ARIZONA.** **Cochise Co.:** Miller Cyn., Huachuca Mts. (UCB); SW Rsrh. Stn., 5 mi W Portal (UCR); Chiricahua Mts.: Cave Crk. Cyn., Herb Martyr Dam, 1768 m (AMNH); Cave Crk. Cyn., E Turkey Crk., 6.5 mi W of Portal, 1950 m (AMNH); Cave Crk. Ranch, 1524 m (UCR); Deer Pk., 2438 m (CAS); Rustler Pk., 2438–2743 m (CAS). **Coconino Co.:** Grand Cyn., N Rim (USNM); Williams (USNM). **Pima Co.:** Tucson (USNM). **COLORADO.** Cascade Lodge, Rocky Mt. Nat. Pk. (USNM). **Larimer Co.:** Cameron Pass, 3135 m (USU). **UTAH.** **Wasatch Co.:** 12 mi SE Heber City, 2286 m (OSU). **Washington Co.:** Oak Grove Camp, Leeds Cyn. (USU).

Phytocoris knowltoni Knight

Figures 100, 108

Phytocoris knowltoni Knight, 1974: 126, 127, fig. 4.

Phytocoris elongatus Knight, 1974: 131, fig. 10. **NEW SYNONYMY.**

Phytocoris albertae Knight, 1974: 131, 132, fig. 11. – Kelton, 1980: 175, fig. 125, map 52. **NEW SYNONYMY.**

TYPES: *Phytocoris knowltoni* was described from two specimens collected in Uintah, Weber Co., Utah, 1 August 1963, G. F. Knowlton. The male holotype and allotype are retained in the Knight Collection (USNM).

The junior synonym, *elongatus*, was described from three male specimens. The holotype was taken 17 mi E of Mayfield, Sanpete Co., Utah, 3110 m, 20 July 1960, P. and B. Rindge; and two paratypes were collected at Rices Spur, Colorado, 1 August 1960, E. D. Ball. All type material is retained in the Knight Collection (USNM).

The junior synonym, *albertae*, was described from two male specimens collected at Nordegg, Alberta, Canada, 25 July 1921, J. McDunnough. These specimens were originally included as paratypes in the type series of *junceus* Knight (1923), but have since been recognized as a distinct species (Knight, 1974). The holotype and single paratype are retained in the Knight Collection (USNM).

DIAGNOSIS: Length 7.3–9.3. *Phytocoris knowltoni* is very similar to *yollabollae* and *rainieri*, but differs by the shorter first antennal segment, ratio of segment length to width of head across eyes less than 1.15:1; and more extensively darkened clavus. This species also resembles *dreisbachi* and *usingeri* but is distinguished by the smaller number of serrations (8–10) on the sclerotized process (fig. 108e), and the smaller, rounded spinose region on the left basal lobe of the vesica. *Phytocoris knowltoni* is easily separated from *cowaniae* by its larger size, continuous fuscous band across posterior submargin of pronotal disk, and broad, weakly elevated left genital tubercle of the male (fig. 108a).

DISCUSSION: *Phytocoris knowltoni* has been collected in the Wasatch Range of central and northern Utah, in mountainous regions of southeastern Idaho, and in the Rocky Mts. from southern Colorado to western Alberta, Canada. The host plant of this species is *Picea*. Adults have been collected on *P. engelmannii* Parry in western states and on *P. glauca* (Moench) Voss in Alberta. I have examined 34 specimens with collection dates from July 4 to August 17. Most of this material was collected at elevations exceeding 2750 m.

Phytocoris nigrifrons Van Duzee

Figure 109

Phytocoris nigrifrons Van Duzee, 1920: 352, 353.

– Usinger, 1933: 171. – Carvalho, 1959: 208. – Knight, 1968: 215. – Kelton, 1979: 689.

Phytocoris tehamae Bliven, 1956: 16, 17. **NEW SYNONYMY.**

Phytocoris abiesi Knight, 1974: 124, 125, fig. 1. **NEW SYNONYMY.**

TYPES: *Phytocoris nigrifrons* was described from four female specimens collected near Huntington Lake, Fresno Co., California, 2134–2743 m, 16–25 July 1919, E. P. Van Duzee. The holotype (no. 709) and two paratypes are retained in the Van Duzee Collection (CAS) and one paratype is deposited in the Knight Collection (USNM).

The junior synonym, *tehamae*, was described from a single specimen taken at Mineral, Tehama Co., California, 11 August 1935. This specimen is deposited in the collection of the CAS.

The junior synonym, *abiesi*, was described from two specimens with the following label data: "9 mi E Shasta City, Calif., *Abies shastensis*, August 8, 1956, Joe Schuh Collector". Although the label refers to a location east of Shasta City (now abbreviated to Shasta) in Shasta County, it is likely that these specimens were actually collected east of the city of Mt. Shasta in Siskiyou County. These geographic locations are often confused due to a rather complex history of name changes. Also, the location as stated on the label is well removed from the nearest naturally occurring stand of *Abies magnifica* A. Murr., var. *shastensis* Lemmon. or any other *Abies* species. The male holotype and allotype of *abiesi* are retained in the Knight Collection (USNM).

DIAGNOSIS: This species closely resembles *coniferalis* but is distinguished by the larger size, 7.3–8.5; brownish yellow second antennal segment with fuscous apex; darkened frons; single dark annulus on apices of front tibiae; and structure of the male genitalia (fig. 109). *Phytocoris nigrifrons* is distinguished from the remaining species of the *junceus* group by the pale lateral margins of the pronotal disk, and the pale propleura with one or two reddish brown or fuscous stripes crossing anterior margin.

DISCUSSION: *Phytocoris nigrifrons* is distributed throughout the Sierran Forest Province of California from Mt. Shasta, Siskiyou Co., to Huntington Lk. in Fresno County. Adult specimens have been collected on *Abies concolor* (Gord. & Glend.) Lindl. and *Abies magnifica* A. Murr., mostly at elevations between 1800 and 2500 meters. I have examined 29 specimens with collection dates from June 26 to August 31.

Phytocoris abiesi and *tehamae* are indistinguishable from *nigrifrons* on the basis of external features as well as genitalic characteristics, and are here placed in synonymy with the latter species.

Phytocoris nobilis Stonedahl

Figures 97, 110

Phytocoris nobilis Stonedahl, 1984: 47–50, figs. 1–4.

TYPES: Described from 21 specimens collected in Benton and Lane counties, Oregon. The male holotype and one female paratype

were taken in the H. J. Andrews Experimental Forest, T15S R6E Sec. 29, NW $\frac{1}{4}$, Lane Co., Oregon, 1450 m, 31 July 1979, ex. *Abies procera* Rehd., G. M. Cooper. These specimens are deposited in the collection of the USNM. Paratypes are deposited in the collections of the AMNH, CAS, and OSU.

DIAGNOSIS: Length 6.7–8.9. *Phytocoris nobilis* is distinguished from other members of the *junceus* group by the following combination of characters: general coloration grayish white with fuscous markings; lateral margins of pronotal disk broadly fuscous, posterior submargin broadly pale medially (fig. 97); first antennal segment with few bristlelike setae, length of setae less than width of segment (fig. 97); and hind femora fuscous, with scattered pale spots and oblique pale band before apex (fig. 97).

DISCUSSION: This species is known from several localities in the Coast and Cascade ranges of Oregon. Adult specimens have been collected from *Abies amabilis* (Dougl.) Forbes and *Abies procera* Rehd. I have examined 27 specimens with collection dates from July 20 to August 17. Further collecting at high elevations in Oregon and Washington should extend the range of this species considerably.

Phytocoris quercinus, new species

Figure 111

HOLOTYPE MALE: Old CCC Cmpgd. S of Globe on Pioneer Pass Rd., 1432 m, Gila Co., Arizona, 30–31 May 1983, attracted to MV lamp, R. T. Schuh, G. M. Stonedahl, and B. M. Massie (AMNH).

PARATYPES: ARIZONA. **Gila Co.:** 3 males, same data as holotype and 2 females, same data as holotype except taken on *Quercus turbinella* Greene (AMNH). **Graham Co.:** 1 male, 1 female, Stockton Pass, Pinaleno Mts., 1585–1675 m, 1–2 June 1983, attracted to MV lamp, R. T. Schuh and G. M. Stonedahl (AMNH). **Pima Co.:** 2 males, 3 females, Bear Cyn. Picnic Area, Santa Catalina Mts., 1737 m, 12 June 1983, ex. *Quercus oblongifolia* Torr., R. T. Schuh, M. D. Schwartz, and G. M. Stonedahl (AMNH); 1 male, 7.5 mi N of Coronado Nat. For. boundary on Mt. Lemmon Rd., 1433 m, 11 June 1983, MV light, R. T. Schuh, M. D. Schwartz, and G. M. Stonedahl (AMNH). **Yavapai Co.:** 6 males, 5

females, 2 mi S Jct. Rt. 89A on Rt. 89, 4 June 1983, ex. *Quercus turbinella*, G. M. Stonedahl (AMNH); 1 male, 15.8 mi S Ash Fork on Rt. 89, 4 June 1983, ex. *Quercus turbinella*, G. M. Stonedahl (AMNH).

DIAGNOSIS: This species closely resembles *decurvatus*, but is distinguished by the structure of the male genitalia (fig. 111), and pronotum usually with broad, strongly contrasting dark band or series of patches behind calli. *Phytocoris quercinus* is distinguished from *intermontanus* by the broader shaft of the left paramere (fig. 111c), sclerotized process of vesica with 13 or 14 serrations (fig. 111e), and apices of front tibiae narrowly pale. The absence of a prominent tubercle on the genital capsule above the left paramere base (fig. 111a) will distinguish *quercinus* from the remaining *junceus* group species.

DESCRIPTION: *Male.* Length 5.50–6.45, width 1.87–2.30; brown general coloration. **Head:** width across eyes 1.05–1.17, vertex 0.26–0.30; pale brownish yellow with reddish brown to fuscous markings; lorum, jugum, and junction of frons and tylus often extensively darkened; frons weakly convex, meeting tylus along broad depression, with 6–8 indistinct striae laterally; eyes large, occupying three-fourths of head height or slightly more. **Rostrum:** length 2.39–2.63, reaching fourth or fifth abdominal segment. **Antennae:** I, length 0.99–1.17, pale with fuscous markings and scattered erect bristlelike setae dorsally and laterally, ventral surface mostly pale; II, length 2.35–2.62, brown or dark brown, medial third sometimes yellowish brown; III, length 1.17–1.35, dark brown, narrowly pale at base and apex; IV, length 0.92–1.18, dark brown. **Pronotum:** mesal length 0.83–1.01, posterior width 1.46–1.78; grayish white or creamy white, tinged with brown or fuscous; lateral and posterior margins, and region behind calli more extensively darkened with fuscous; collar and calli mottled with reddish brown or fuscous; propleura fuscous, apical third white. **Scutellum:** pale with limited fuscous markings dorsally, and large dark spot either side before apex. **Hemelytra:** grayish white or creamy white, moderately to extensively mottled with brown or fuscous; corium with large angulate fuscous mark between anal ridge and radial vein; cuneus sometimes lightly tinged with pink, inner margin and

apex mostly fuscous; membrane moderately to densely conspurcate, veins dark, pale distally. **Legs:** femora creamy white or pale yellow, reticulated with reddish brown or fuscous, dark regions often broken by pale spots; tibiae pale with fuscous markings, front and middle pairs with three dark annuli; tarsi yellowish brown. **Vestiture:** dorsum with dark simple setae, silvery white, sericeous setae, and narrow, dark brown or black, scalelike setae. **Genitalia:** Figure 111.

Female. Similar to male in color, vestiture, and structure. Length 5.50–6.35, width 1.92–2.20. **Head:** width across eyes 1.05–1.16, vertex 0.36–0.42. **Rostrum:** length 2.50–2.70, reaching fifth or sixth abdominal segment. **Antennae:** I, 1.14–1.29; II, 2.46–2.63; III, 1.10–1.30; IV, 0.95–1.07. **Pronotum:** mesal length 0.88–0.96, posterior width 1.56–1.77.

ETYMOLOGY: From the Latin, *quercinus* (of oaks), referring to its occurrence on plants of the genus *Quercus*.

DISCUSSION: *Phytocoris quercinus* is known from Gila, Graham, Mohave, Pima, and Yavapai counties in Arizona where it has been collected on *Quercus arizonica* Sarg., *Q. oblongifolia* Torr., and *Q. turbinella* Greene. Males have been taken at light. Collection dates are from May 30 to June 15.

ADDITIONAL SPECIMENS: One female each from the following localities: ARIZONA. **Gila Co.:** 2 mi SE of Gila Co. line (4 mi NE of Strawberry) on Rt. 87, 1981 m (AMNH). **Mohave Co.:** Hualapai Mts., SE of Kingman, T20N R15W, 1220–1950 m (AMNH).

Phytocoris radiatae, new species

Figure 112

HOLOTYPE MALE: Last Chance Rd., Santa Cruz Co., California, 6 February 1979, ex. *Pinus radiata* D. Don., C. P. Ohmart (OSU; donated to the AMNH).

PARATYPES: CALIFORNIA. **Santa Cruz Co.:** 2 females, same data as holotype (AMNH, OSU); 2 males, same data as holotype except 27 September 1978 (AMNH, OSU); 1 female, same data as holotype except 7 November 1978 (USNM); 1 female, Swanton Rd., 20 April 1979, ex. *Pinus radiata*, W. G. Nolt (CAS).

DIAGNOSIS: Distinguished from other species of the *junceus* group by its small size,

brown or yellowish brown dorsal two-thirds of the propleuron, genital capsule of male without prominent tubercle dorsad of left paramere base (fig. 112a), and shaft of left paramere without lateral protuberance basally (fig. 112c). Further distinguished from *decurvatus*, *intermontanus*, and *quercinus* by the more strongly produced sensory lobe of the left paramere (fig. 112b), genital capsule noticeably swollen dorsad of left paramere base (fig. 112a), and form of the sclerotized process of the vesica (fig. 112e). Externally, *radiatae* is very similar to members of the *stellatus* group, especially *alpestris*, but the genital structures of the male (e.g., elongate right paramere, serrated sclerotized process, vesica with small sclerotized region dorsad of left margin of gonopore) strongly support its placement in the *junceus* group.

DESCRIPTION: *Male.* Length 6.05–6.59, width 1.80–1.91; brown or reddish brown general coloration. **Head:** width across eyes 0.98–1.06, vertex 0.27–0.30; pale brownish yellow; buccula, jugum, lorum, and basolateral margin of tylus marked with red; frons and tylus tinged with fuscous; frons weakly convex, meeting tylus along shallow depression. **Rostrum:** length 2.32–2.38, reaching slightly beyond apices of hind coxae. **Antennae:** I, length 0.81–0.91, white or pale yellow with fuscous reticulations, ventral surface uniformly pale; II, length 2.27–2.56, brown or yellowish brown with narrow pale annulus at base, apical fourth to one third fuscous; III, length 1.26–1.35, fuscous, narrowly pale at base; IV, length 0.59 (teneral), fuscous. **Pronotum:** mesal length 0.72–0.77, posterior width 1.30–1.44; disk grayish brown, posterior margin pale; collar and calli yellowish brown, calli usually with fuscous reticulations; propleura brownish yellow, apical third pale, usually with pair of faint reddish marks anteriorly. **Scutellum:** brownish yellow, extensively tinged with fuscous, apex pale. **Hemelytra:** grayish white, translucent ground color; moderately to densely tinged with yellowish brown to fuscous, sometimes also with faint reddish tinge especially on apical half of corium and along outer margins of corium and cuneus; corium with distinct pale patch medially and at apex; membrane mottled with brown or fuscous patches. **Legs:** femora pale

yellow, reticulated with reddish brown or fuscous, dark regions usually broken by pale spots; tibiae pale with fuscous markings; front and middle tibiae with three, sometimes obscured, dark annuli. **Vestiture:** dorsum with black, simple setae and silvery white, sericeous setae; pale regions on hemelytra usually more densely set with sericeous setae. **Genitalia:** Figure 112.

Female. Similar to male in color, vestiture, and structure. Length 5.56–5.72, width 1.87–1.93. **Head:** width across eyes 0.94–1.00, vertex 0.39–0.41. **Rostrum:** length 2.32–2.41, reaching between hind coxae. **Antennae:** I, 0.76–0.86; II, 2.03–2.20; III, 1.28–1.33; IV, 0.90. **Pronotum:** mesal length 0.72–0.77, posterior width 1.35–1.46.

ETYMOLOGY: Named for its host plant.

DISCUSSION: *Phytocoris radiatae* is known only from Santa Cruz Co., California where it occurs on *Pinus radiata* D. Don. Collection dates are from February 6 to November 7.

Phytocoris rainieri Knight

Phytocoris rainieri Knight, 1974: 126.

TYPES: This species was described from two female specimens collected from “coniferous trees” on Mt. Rainier, Washington, 14 August 1931, H. H. Knight. Both specimens are retained in the Knight Collection (USNM).

DIAGNOSIS: Length 7.0–7.2. Recognized by the long first antennal segment with erect bristlelike setae dorsally (see couplets 9 and 10 in key); narrowly fuscous lateral margins of the pronotal disk; fuscous propleura with apical third pale; clavus mostly pale with vein and inner margin bordering scutellum reddish brown or dark brown; and hind femora pale yellow with reddish brown, reticulate pattern. Although the male of *rainieri* is not known, it is assumed to have typical *junceus* group genitalia (e.g., large left genital tubercle, single serrate sclerotized process of vesica). This assumption is based on the similarity in external morphology of *rainieri* and other conifer inhabiting members of the group, particularly *yollabollae* and *knowltoni*.

DISCUSSION: Beside type material, I have examined four females of *rainieri* from the Cascade Range of Oregon and Washington. One specimen was taken on Mt. Rainier,

Washington; another near Barlow Pass, Hood River Co., Oregon on *Abies procera* Rehd.; and two at Rainbow, Lane Co., Oregon on *Abies amabilis* (Dougl.) Forbes. These specimens were collected in July and August.

The specimens from Mt. Rainier are pale across the posterior submargin of the pronotal disk, whereas those collected in Oregon have a narrow fuscous line across the base of the disk. Although the difference in pronotal coloration may be the result of intraspecific variation, it also is possible that specimens from the two areas are not conspecific. A further assessment of the distribution of *rainieri* and its relationship to other members of the *junceus* group is not possible until the species is better collected and males are available for study.

Phytocoris tricinctipes Knight

Figure 113

Phytocoris tricinctipes Knight, 1968: 230, 231, fig. 280.

TYPES: Described from seven specimens taken in Nevada. The female holotype was collected in Area 18M(T), Nevada Test Site, near Mercury, Nye Co., 22 July 1965, taken at light, E. Beck and J. Merino. The holotype, male allotype, and two female paratypes are retained in the Knight Collection (USNM). The remaining three paratypes were not located.

DIAGNOSIS: Length 6.5–7.7; grayish white ground color with extensive brown to fuscous markings. *Phytocoris tricinctipes* is distinguished from other species of the *junceus* group by the uniformly brown or dark brown pronotal disk, with posterior margin narrowly pale; wing membrane pale, moderately to extensively darkened with strongly contrasting fuscous markings; left genital tubercle of male cylindrical (fig. 113a); and shaft of left paramere with strongly produced, rounded basal protuberance (fig. 113c). It is further differentiated from the closely related species *argus* by the short bristlelike setae on antennal segment I (see couplet 6 in key).

DISCUSSION: *Phytocoris tricinctipes* has been collected in Inyo Co., California and throughout much of Nevada on *Pinus monophylla* Torr. & Frem. Both sexes are attracted to

light. I have examined 43 specimens with collection dates from July 2 to July 26.

Phytocoris usingeri, new species

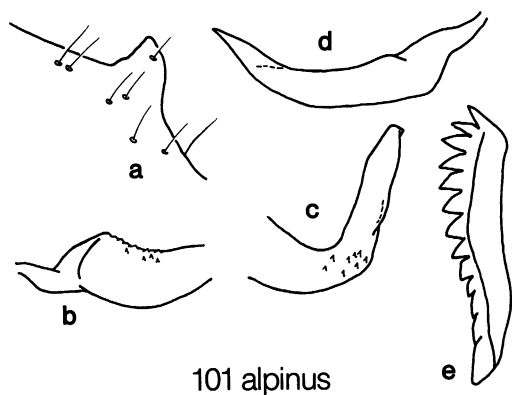
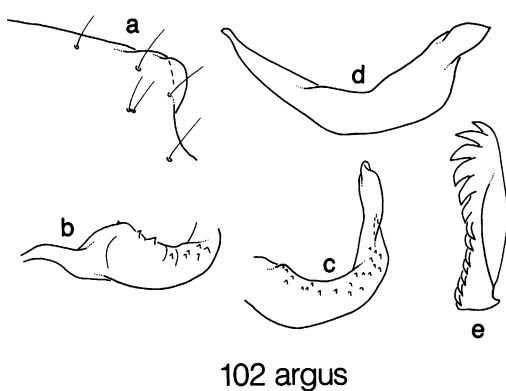
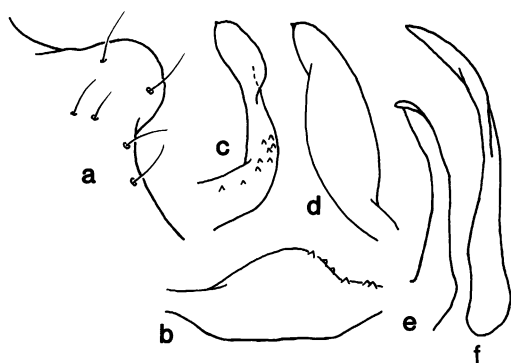
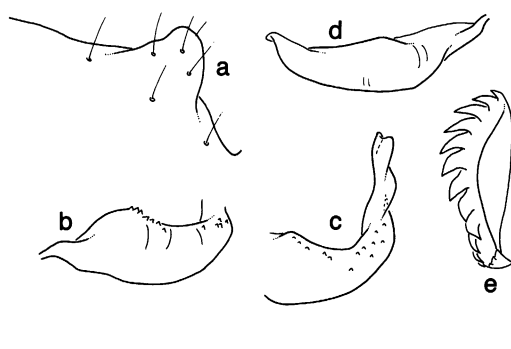
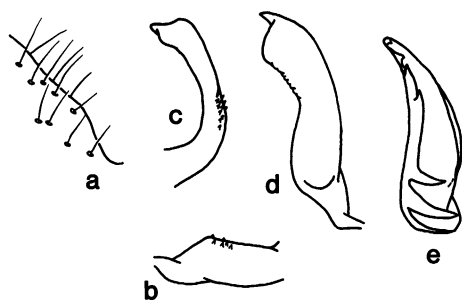
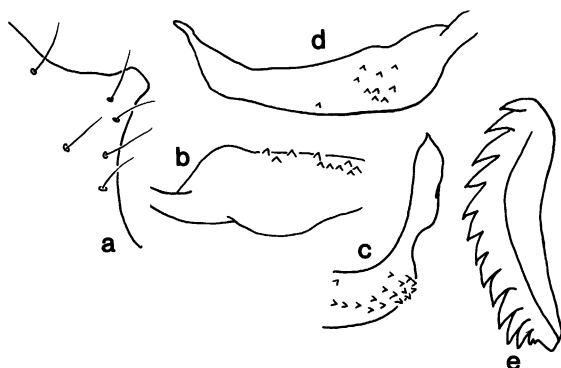
Figure 114

HOLOTYPE MALE: 6.6 mi S of Lava Beds Nat. Mon. on Lava Beds-Medicine Lk. Rd., Siskiyou Co., California, 18 July 1985, ex. *Pinus contorta* Dougl., G. M. Stonedahl and J. D. McIver (AMNH).

PARATYPES: CALIFORNIA. **Madera Co.:** 1 male, Chiquito Lk., 28 July 1958, M. E. Irwin (OSU). **Mariposa Co.:** 1 male, Yosemite Crk. Rgr. Stn., Yosemite Nat. Pk., 21 July 1946, ex. *Pinus murrayana* Grev. & Balf., R. L. Usinger (UCB); 1 male, Yosemite Nat. Pk., 1 August 1940, D. E. Hardy (KU). **Siskiyou Co.:** 6 males, 5 females, same data as holotype (AMNH, CAS, USNM). **OREGON. Klamath Co.:** 1 female, Skookum Mdws., T27S R9E Sec. 16, 1620 m, 17 July 1979, ex. *Pinus contorta*, G. M. Stonedahl (OSU).

DIAGNOSIS: Distinguished from other members of the *junceus* group by the following combination of characters: ratio of length of antennal segment I to width of head across eyes less than 1.15:1; pronotal disk extensively darkened, sometimes only narrowly pale behind calli; propleura shiny fuscous, apical third pale; clavus moderately to extensively darkened; left genital tubercle large and broadly rounded (fig. 114a); and sclerotized process of vesica with 12–15 serrations, basal serrations smaller than distal ones (fig. 114e).

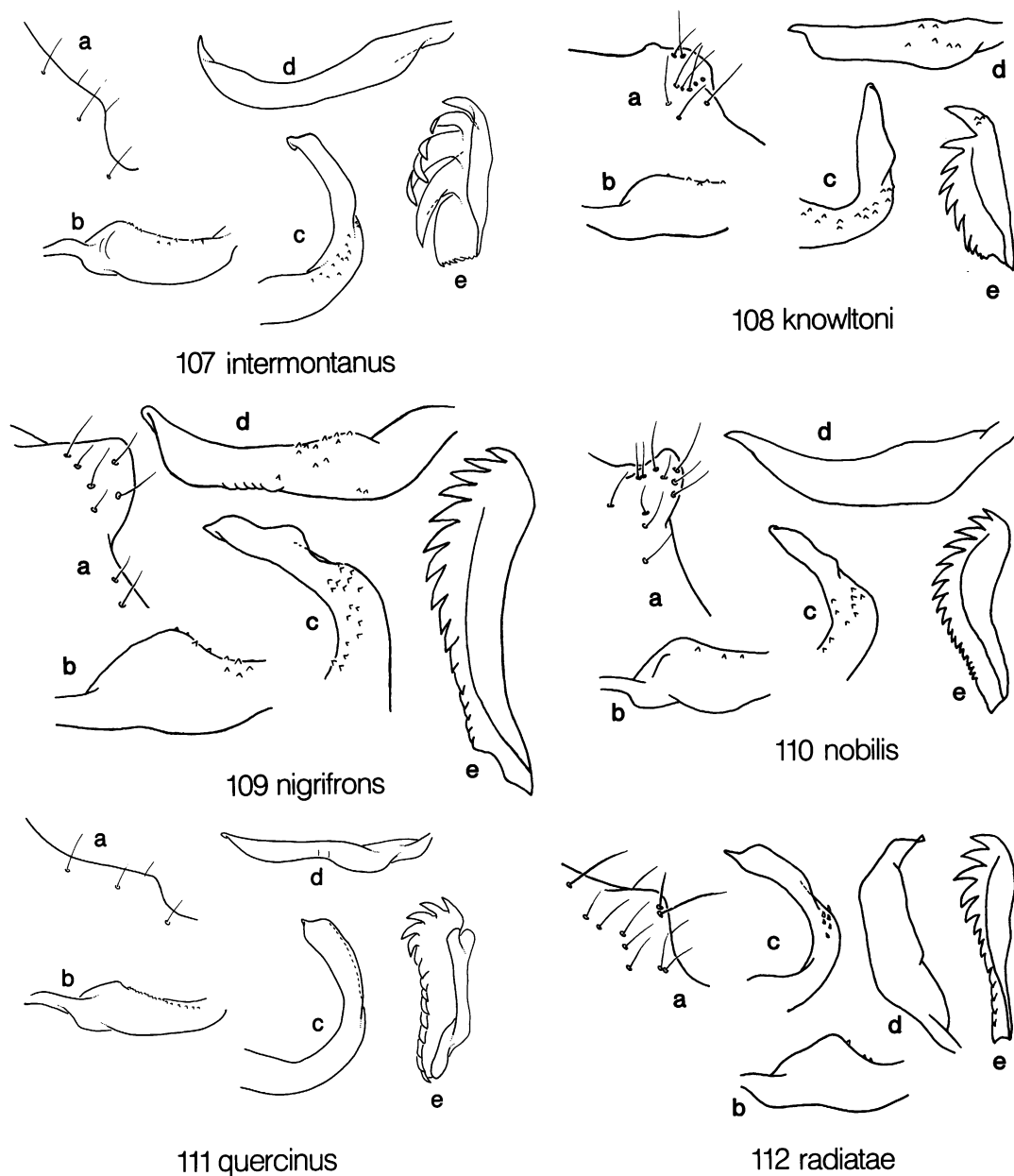
DESCRIPTION: *Male.* Length 8.42–8.80, width 2.52–2.61; pale grayish yellow ground color with brown to fuscous markings. **Head:** width across eyes 1.19–1.22, vertex 0.46–0.47; pale yellow with shiny, reddish brown to fuscous markings; frons with six or seven reddish brown striae laterally. **Rostrum:** length 3.78–3.91, reaching seventh abdominal segment. **Antennae:** I, length 1.30–1.37, pale yellow, dorsal surface mottled with brown or fuscous and densely set with erect, bristlelike setae; II, length 3.15–3.33, yellowish brown or brown; III, length 1.58–1.66, brown to fuscous; IV, length 0.92–0.94, brown to fuscous. **Pronotum:** mesal length 1.26–1.33, posterior

101 *alpinus*102 *argus*103 *coniferalis*104 *cowariae*105 *decurvatus*106 *dreisbachi*

Figs. 101–106. Male genitalia of *junceus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral or dorsolateral view. e. Sclerotized process of vesica, or left sclerotized process for *coniferalis*. f. Right sclerotized process of vesica for *coniferalis*.

width 2.03–2.12; disk pale yellow, lateral margins and posterior submargin broadly fuscous, sometimes only narrowly pale behind calli; collar fuscous with pale spot medially and at each lateral angle; calli marked

with fuscous; propleura shiny fuscous, apical third pale. **Scutellum:** fuscous; median line, anterolateral angles, and apex pale. **Hemelytra:** grayish white or pale grayish yellow with brown to fuscous markings; middle and

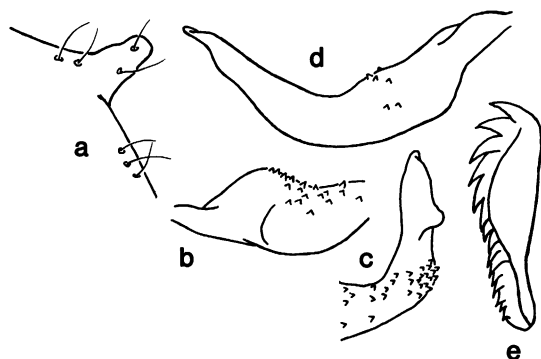
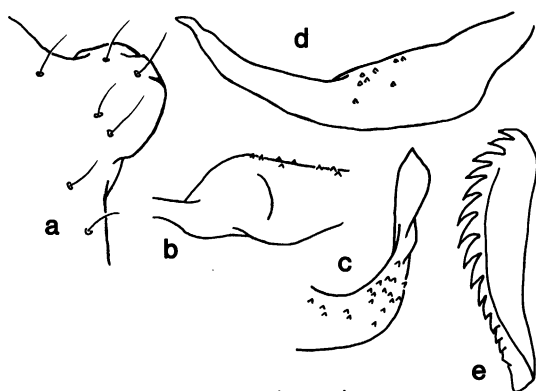
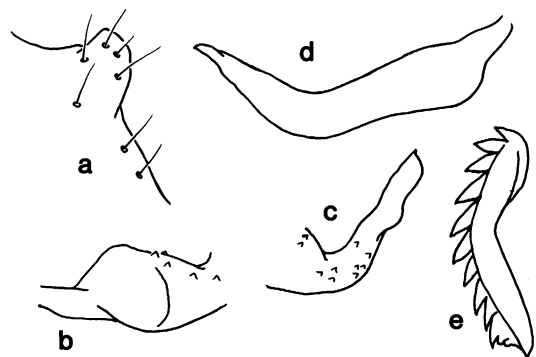


Figs. 107–112. Male genitalia of *junceus* group species. **a**. Left dorsolateral margin of genital capsule. **b**. Arm of left clasper, lateral view. **c**. Shaft of left clasper, dorsal view. **d**. Right clasper, dorsolateral view. **e**. Sclerotized process of vesica.

apex of corium with large pale patch; basal half of cuneus predominantly pale, sometimes invaded by brown; membrane mottled with brown. **Legs**: femora pale yellow with reticulate pattern of reddish brown or fuscous, densely set with erect dark setae; hind femora with irregular pale band before apex;

tibiae pale with three poorly defined dark annuli. **Vestiture**: dorsum with dark, simple setae and narrow, silvery white, scalelike setae. **Genitalia**: Figure 114.

Female. Similar to male in color, vestiture, and structure. Length 7.40, width 2.47. **Head**: width across eyes 1.20, vertex 0.51. **Rostrum**:

113 *tricinctipes*114 *usingeri*115 *yollabollae*

Figs. 113–115. Male genitalia of *junceus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, dorsolateral view. e. Sclerotized process of vesica.

length 3.76, reaching eighth abdominal segment. **Antennae:** I, 1.24; II, 3.15; III, 1.67; IV, missing. **Pronotum:** mesal length 1.12, posterior width 1.94. The female of this species is known from a single specimen.

ETYMOLOGY: Named in honor of Robert Leslie Usinger, devoted and inspirational 20th century heteropterist.

DISCUSSION: *Phytocoris usingeri* is known only from the type material collected in southern Oregon and northern California. Most of the specimens were taken on *Pinus contorta*, which appears to be the host plant of the species.

Phytocoris yollabollae Bliven

Figures 99, 115

Phytocoris yollabollae Bliven, 1956: 17, 18, pl. II, fig. 10.

Phytocoris taos Knight, 1974: 127, fig. 5. NEW SYNONYMY.

Phytocoris albiclavus Knight, 1974: 127, 128. NEW SYNONYMY.

Phytocoris montanae Knight, 1974: 128, fig. 6. NEW SYNONYMY.

TYPES: *Phytocoris yollabollae* was described from a single female taken near the Yolla Bolly Middle Eel Wilderness, Van Duzen Rd., Trinity Co., California, 24 July 1949. This specimen is deposited in the collection of the CAS.

The junior synonym, *taos*, was described from a single male collected 5 mi E Taos, Taos Co., New Mexico, 22 July 1968, at light, J. C. Schaffner. The holotype is retained in the Knight Collection (USNM).

Phytocoris albiclavus was described from a single female collected in Broadwater Co., Montana, 28 July 1920, A. A. Nichol. This specimen is deposited in the Knight Collection (USNM).

The junior synonym, *montanae*, was described from two male specimens collected at Bozeman, Gallatin Co., Montana, 6 August 1920. Both specimens are retained in the Knight Collection (USNM).

DIAGNOSIS: Length 7.4–8.5. Recognized by the long first antennal segment with short recumbent setae (see couplets 9 and 10 in key); pronotal disk broadly pale behind calli, posterior submargin with continuous fuscous band; propleura fuscous, apical third pale; clavus mostly pale, vein and inner margin bordering scutellum reddish brown or fuscous; and male with well developed left genital tubercle (fig. 115a), and 10 or 11 strong serrations on sclerotized process of vesica (fig. 115e).

DISCUSSION: *Phytocoris yollabollae* is widely

distributed in the western United States from northern New Mexico; north to Montana, Idaho, and northern Utah; and west to the Cascade and Coast Ranges of Washington, Oregon, and northern California. The host plant of this species is *Pseudotsuga menziesii* (Mirb.) Franco., but in mixed stands specimens are often taken on *Abies* species as well. I have examined 77 specimens with collection dates from July 8 to August 25.

Considerable variation is seen in *yollabollae* over its range of occurrence, particularly in specimens from Utah and New Mexico. Most of the observed variation (e.g., degree of darkening of pronotal disk, minor differences in shape of male genital parameres) appears not to be correlated with geography. However, a few genitalic characters (e.g., size of apical accessory lobes of vesica, curvature of medial ridge of sclerotized process) show a more or less continuous east to west, or north to south trend (see discussion below). In the absence of any significant discontinuities or geographically distinct populations, there is little evidence to indicate that more than one species is involved. Based on these observations, I am placing *albiclavus*, *mon-*

tanae, and *taos* in synonymy with *yollabollae*. I have examined the types of these species and found each one to be well within the range of variation noted for *yollabollae*.

The extent of darkening of the pronotal disk of *yollabollae* is extremely variable. The disk of most specimens is broadly pale medially, but some individuals from southern Utah and northern New Mexico are extensively darkened and have only a narrow pale region behind the calli. The length of the first antennal segment varies considerably, and tends to be shortest in specimens from Utah and New Mexico. Genital structures of the male also are somewhat variable. In general, the size of the apical accessory lobes of the vesica get progressively smaller from north to south in the Rocky Mountain states. The parameres display minor variation, particularly in the development of the sensory lobe of the left paramere and the outer curvature of the arm of the right paramere. However, these differences seem not to be correlated with geography. Finally, the medial ridge of the sclerotized process tends to be more strongly curved in specimens collected west of the Cascade Range.

JUNIPERANUS SPECIES-GROUP

DIAGNOSIS: Recognized by the small size; dorsal vestiture usually with two types of asymmetrical scalelike setae (figs. 123–125); length of antennal segment I usually less than or equal to width of head across eyes; and structure of the male genitalia, especially the bladelike or teardrop-shaped sclerotized process of the vesica, and genital capsule with prominent tubercle above base of left paramere. Although extremely variable in general coloration, *juniperanus* group species share many characters with members of the *conspurcatus* group (see *conspurcatus* group discussion for list of synapomorphies). The two groups are distinguished primarily on the basis of characters of the male genitalia, but in general, *juniperanus* group species are smaller and with a shorter first antennal segment than members of the *conspurcatus* group.

DESCRIPTION: Small to moderate size, 3.3–5.8, red, green, or yellowish brown to dark brown species; vestiture of dorsum variable: all species with pale to dark brown simple

setae; *breviusculus*, *miniatus*, *polhemusi*, and *vanduzeei* with silvery white to golden, sericeous setae (figs. 120, 121); all other species with silvery white scalelike setae (figs. 123, 125) and dark brown or black scalelike setae (figs. 123, 124), except *cuneotinctus* with strongly pedicellate, pale, scalelike setae only (fig. 122); scalelike setae sometimes with divided or serrate apex, surface ridges oblique to nearly parallel, or sometimes irregular or anastomosed; dark scalelike setae usually broader than pale scalelike setae (fig. 123); both types of scalelike setae strongly asymmetrical. **Head:** elliptical to nearly quadrate with weakly to moderately convex frons, large eyes, and narrow vertex; antennae variously colored and marked; segment I sometimes with brush of long, pale setae on ventral surface; length of segment I usually less than or equal to width of head across eyes; segment II sometimes with pale, median annulus; frons meeting tylus along broad depression; tylus weakly to strongly produced at base; eyes oc-

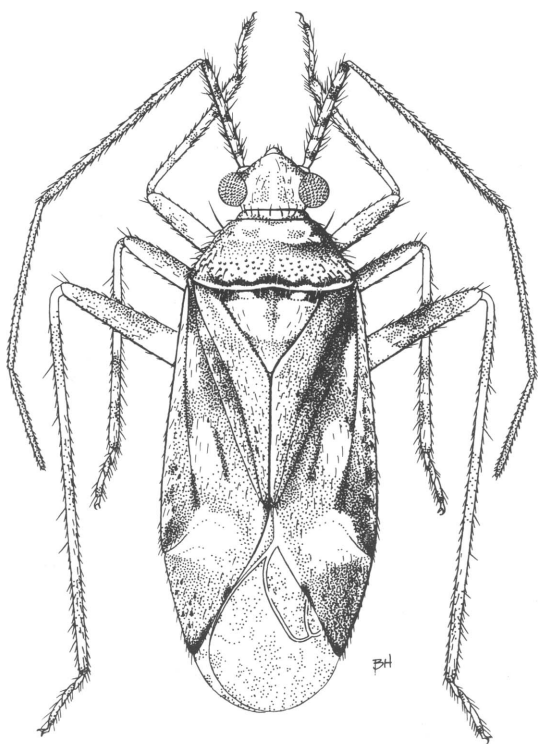


Fig. 116. *Phytocoris tricinctus*, dorsal habitus of male.

cupying two-thirds to three-fourths of head height in lateral view. **Pronotum:** posterior submargin of disk, in darker species, with fuscous band or 4–6 weakly elevated, fuscous points; propleura pale, sometimes lightly marked with red to fuscous, dorsal margin sometimes narrowly infuscated. **Hemelytra:** white, pale yellow, or pale green ground color, variously marked with red, reddish brown, brown, or fuscous, except *vanduzeei* uniformly yellowish green to bright green; membrane moderately to densely conspurcate, spots sometimes coalescing to form larger fuscous patches. **Legs:** femora pale yellow or green, with red, brown, or fuscous markings, particularly on apical half; hind femora sometimes with reticulate pattern; tibial color patterns variable, sometimes with alternating light and dark annuli. **Male genitalia:** genital capsule with prominent tubercle above base of left paramere, tubercles variable in size and shape, sometimes with dense brush of stout, dark setae basally. *Left paramere:* sensory lobe moderately to strongly produced; shaft slightly expanded distally in dorsal view,

expanded region flattened dorsoventrally; apex acute or narrowly truncate. *Right paramere:* simple lanceolate shape, similar for all members of group; apex acute. *Vesica:* primary membranous sac multilobed, lobes usually with spinose region(s); left basal region of membranous sac sometimes weakly sclerotized or encompassing a small sclerotized plate or elongate strap, straplike sclerite sometimes extending to or slightly beyond apex of membranous sac, usually broadly attached to sac laterally, or rarely more narrowly attached basally (e.g., *miniatus*, *polhemusi*) and appearing as a second distinct sclerotized process; basal lobes variable in size and shape, right lobe usually much larger than left lobe; basal process well sclerotized, extending above level of gonopore; sclerotized process elongate, lanceolate, or tear-drop-shaped, sometimes gently curved or twisted basally, lateral margins sometimes slightly reflexed; sclerotized process attached to basal process by narrow membranous strap.

DISCUSSION: The *juniperanus* group comprises 20 species that occur predominantly in the arid central and southern portions of the western United States. Several members of this group are known only from the chaparral region and central valley of California, but the majority are distributed in one or more of the following ecoregions of Bailey (1978): American Desert, Colorado Plateau, Intermountain Sagebrush, Mexican Highland. Two exceptions are *occidentalis* which occurs in forested regions of California, Oregon, Washington, and southern British Columbia; and *breviusculus*, a species that is widely distributed in eastern North America but is not known to occur west of the Rocky Mts.

All members of the *juniperanus* group inhabit shrubby plants or small trees. At least five species are associated with juniper and three are found only on pines. Other reported host plants are *Acacia*, *Adenostoma*, *Atriplex*, *Ephedra*, *Holacantha*, *Larrea*, *Prosopis*, and *Rhamnus*.

KEY TO SPECIES OF THE *JUNIPERANUS* GROUP

Portions of the following key serve only in the separation of male specimens based on characteristics of the genitalia.

- 1 Hemelytra pale green, yellowish green, or bright green 2
 Hemelytra not green 3
- 2(1) Hemelytra pale green with small dusky flecks *cuneotinctus* Knight
 Hemelytra yellowish green to bright green, without dusky flecks
 *vanduzeei* Reuter
- 3(1) Corium marked or tinged with red, or if red markings somewhat obscure, then corium uniformly pale brownish orange 4
 Corium without red markings, never uniformly brownish orange; cuneus sometimes lightly marked with red 8
- 4(3) Clavus and corium creamy white or pale grayish yellow, variously tinged and marked with red to fuscous; length of antennal segment I equal to or greater than dorsoventral height of eye; vesica with one or two sclerotized processes 5
 Clavus and corium uniformly pale brownish orange, without dark markings; length of antennal segment I less than dorsoventral height of eye; vesica with two sclerotized processes (fig. 141e, f)
 *polhemusi* n. sp.
- 5(4) Erect bristlelike setae on first antennal segment dark brown or black; left genital tubercle of male with densely distributed, dark bristlelike setae dorsally (fig. 127a) *adenostomae* Stonedahl
 Erect setae on first antennal segment pale; left genital tubercle with scattered pale setae dorsally 6
- 6(5) Length 4.5–5.8; left genital tubercle large and strongly tapered (fig. 140a)
 *occidentalis* Stonedahl
 Length 3.3–4.4; left genital tubercle small, only slightly tapered (figs. 126a, 137a) 7
- 7(6) Scutellum with reddish median line; vesica with one sclerotized process (fig. 126e) *acaciae* Knight
 Scutellum mottled with red but lacking distinct median line; vesica with two sclerotized processes (fig. 137e, f)
 *miniatus* Knight
- 8(3) Antennal segment I with dense brush of long, pale setae ventrally (fig. 118) .. 9
 Antennal segment I with short, predominantly dark setae ventrally 10
- 9(8) Grayish white or pale yellowish gray general coloration; abdomen with black longitudinal line laterally, reaching eighth segment; base of left genital tubercle with sparsely distributed pale setae (fig. 145a) *ventralis* Van D.
- Brown general coloration; abdomen without black longitudinal lines laterally; base of left genital tubercle with numerous stout dark setae (fig. 143a)
 *tricinctus* Knight
- 10(8) Left genital tubercle with moderately to densely distributed, erect bristlelike setae; tubercle large, broadly produced, except somewhat smaller and more elongate for *albellus* and *juniperanus* 11
 Left genital tubercle with only a few bristlelike setae; tubercle small, narrowly produced and usually slightly tapered, except broad and weakly protruding for *albifrons* 18
- 11(10) Left genital tubercle narrow (figs. 129a, 135a), or if somewhat broadly produced, then strongly tapered (fig. 138a), apex angulate or narrowly rounded ... 12
 Left genital tubercle broad, not or only slightly tapered, apex truncate or broadly rounded (figs. 128a, 139a, 142a) ... 14
- 12(11) Ventral surface of antennal segment I dark reddish brown or fuscous, ratio of segment length to width of head across eyes from 0.75:1 to 0.85:1 for males; left genital tubercle moderately set with long pale setae (figs. 129a, 138a) 13
 Ventral surface of antennal segment I pale, ratio of segment length to width of head across eyes greater than 0.90:1 for males; left genital tubercle densely set with dark, bristlelike setae (fig. 135a)
 *juniperanus* Knight
- 13(12) Propleuron fuscous along dorsal margin, sometimes also with reddish anteromedial stripe; distal half of cuneus pale, apex narrowly fuscous; hind femora uniformly pale yellow, distal fourth sometimes with limited brown or fuscous markings dorsally; male genitalia as in figure 129 *albellus* Knight
 Propleuron pale along dorsal margin, but with reddish anteromedial stripe; distal half of cuneus tinged with red, margins and apex narrowly brown or reddish brown; hind femora with moderately distributed brown or fuscous reticulate markings, mostly on distal half; male genitalia as in figure 138
 *monophyllae* n. sp.
- 14(11) Propleuron mostly fuscous, apical fourth to one-third pale; left basal lobe of vesica with field of small spines laterally 15
 Propleuron mostly pale, dorsal margin and sometimes anteromedial stripe reddish

- brown or fuscous; left basal lobe of vesica without spines, but sometimes with small angulate sclerite laterally . . . 17
- 15(14) Dorsal width of eye of male greater than width of vertex; vesica above left margin of gonopore with two small, basally confluent sclerites . . . *latisquamus* n. sp.
Dorsal width of eye of male equal to or less than width of vertex; vesica above left margin of gonopore with small, partly spinose membranous sac, but lacking distinct sclerites 16
- 16(15) Pronotum dark grayish brown, limited spots on calli and narrow band along posterior margin pale; rostrum reaching between hind coxae; dorsal width of eye of male approximately equal to width of vertex; male genitalia as in figure 134, left tubercle rounded or somewhat angulate apically *hualapai* n. sp.
Pronotum extensively pale, especially around calli and on posterior lobe of disk either side of dark median line; rostrum reaching base of ninth abdominal segment or nearly so; dorsal width of eye of male less than width of vertex; male genitalia as in figure 142, left tubercle broadly truncate apically
..... *sangabriel* n. sp.
- 17(14) Clavus uniformly pale, outer half and apex sometimes lightly tinged with brown; left basal lobe of vesica with small sclerite laterally; shaft of left paramere abruptly and broadly expanded distally (fig. 139c); left genital tubercle as in figure 139
..... *nigrisquamus* n. sp.
Clavus with large elongate, brown or dark brown mark medially; left basal lobe of vesica without sclerite laterally; shaft of left paramere gradually and narrowly expanded distally (fig. 128c); left genital tubercle as in figure 128a
..... *adustus* n. sp.
- 18(10) Antennal segment II brown or dark brown, with pale median annulus; vesica with one sclerotized process 19
Antennal segment II uniformly brownish yellow, without pale median annulus; vesica with two sclerotized processes (fig. 132e, f), left process straplike and broadly attached along lateral margins to membranous sac of vesica
..... *breviusculus* Reuter
- 19(18) Scutellum with fuscous longitudinal line medially *acaciae* Knight
Scutellum mottled with fuscous but without dark median line 20
- 20(19) Scutellum strongly deflexed apically; ratio of length of antennal segment I to width

of head across eyes from 0.65:1 to 0.75:1 for males, and 0.75:1 to 0.95:1 for females, left genital tubercle as in figure 131a *brevicornis* Knight
Scutellum evenly convex, not strongly deflexed apically; ratio of length of antennal segment I to width of head across eyes from 0.85:1 to 1.00:1 for males, and 1.05:1 to 1.20:1 for females; left genital tubercle as in figure 130a
..... *albifrons* Knight

Phytocoris acaciae Knight

Figure 126

Phytocoris acaciae Knight, 1925a: 53, 54. – Carvalho, 1959: 189. – Knight, 1968: 249.

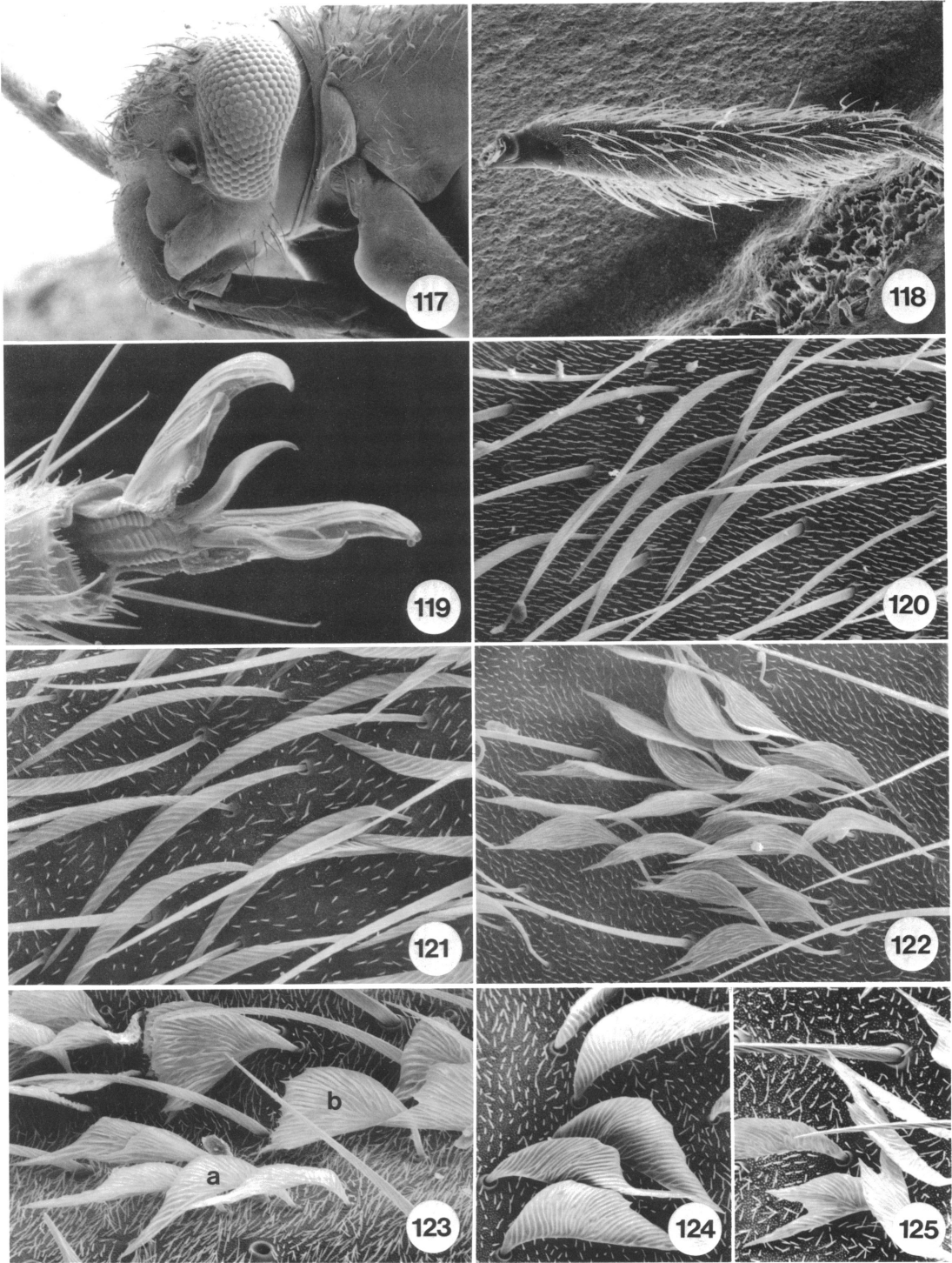
Phytocoris minuendus Knight, 1968: 243, 244, fig. 298. NEW SYNONYMY.

TYPES: *Phytocoris acaciae* was described from 54 specimens collected in Arizona and New Mexico. The male holotype, allotype, and 27 paratypes were taken at Texas Pass, Arizona, 20 July 1917, ex. *Acacia greggii* Gray., H. H. Knight. The holotype, allotype, and 39 paratypes are retained in the Knight Collection (USNM). Two paratypes are deposited in the collection of the UAZ, and a pair are in the CAS collection. Eight paratypes were not located.

The male holotype of the junior synonym, *minuendus*, was collected along the Santa Cruz R., Pima Co., Arizona, 20 April 1926, A. A. Nichol, and is retained in the Knight Collection (USNM).

DIAGNOSIS: Length 3.7–4.5; hemelytra marked with red, or sometimes reddish brown to fuscous. This species closely resembles *adenostomae*, but differs by the pale bristlelike setae on antennal segment I; pale median annulus on antennal segment II; reddish median line on the scutellum; and small left genital tubercle of the male, with sparsely distributed pale setae (fig. 126a).

DISCUSSION: *Phytocoris acaciae* is distributed in southern Arizona. The northernmost record is from Yarnell in Yavapai County. Several specimens also have been collected in Riverside and San Diego counties, California; Hidalgo Co., New Mexico; and near San Felipe, Baja California Norte, Mexico. Knight (1968) records this species from Texas, but does not list a specific locality. Adults and nymphs of *acaciae* have been collected



Figs. 117–125. *Juniperanus* group species. 117. *juniperanus*, lateral view of head. 118. *ventralis*, lateral view of first antennal segment. 119. *juniperanus*, pretarsus. 120. *vanduzeei*, dorsal vestiture. 121. *breviusculus*, dorsal vestiture. 122. *cuneotinctus*, white scalelike setae of dorsal vestiture. 123. *tricinctus*, dorsal vestiture: a, white scalelike setae; b, black scalelike setae. 124, 125. *juniperanus*, dorsal vestiture. 124. black scalelike setae. 125. white scalelike setae.

on *Acacia greggii*. Males and females are attracted to light. I have examined 60 specimens with collection dates from April 28 to September 23.

The male holotype of *minuendus* is here recognized as a melanic specimen of *acaciae*. All other features including the structures of the male genitalia are all but identical to those of paler individuals. Additional dark-colored specimens were examined from Arizona and all are conspecific with *acaciae*. Based on this information, *minuendus* is placed in synonymy with *acaciae*.

Phytocoris adenostomae Stonedahl

Figure 127

Phytocoris adenostomae Stonedahl, 1985: 1271–1274.

TYPES: Described from 19 specimens collected in Riverside and San Diego counties, California. The male holotype and 10 paratypes were taken at Oak Grove, San Diego Co., 10 September 1975, ex. *Adenostoma sparsifolium* Torr., J. D. Pinto. The holotype is deposited at the AMNH; paratypes are deposited in the collection of the UCR.

DIAGNOSIS: Length 3.9–4.5. Distinguished from other species of the *juniperanus* group by the yellowish red general coloration, with fuscous markings on outer half of clavus and inner apical region of corium; black bristlelike setae on the first antennal segment; and structure of the male genitalia, particularly the broad left genital tubercle, with dense patch of dark setae dorsally (fig. 127a).

DISCUSSION: *Phytocoris adenostomae* is distributed in the chaparral region of Los Angeles, Riverside, and San Diego counties, California. It breeds on *Adenostoma sparsifolium* and appears to have more than a single generation per season (Stonedahl, 1985). Although the distribution of *sparsifolium* extends into San Luis Obispo and Santa Barbara counties (Munz and Keck, 1973), *adenostomae* has not been collected north of Mint Canyon in Los Angeles County. I have examined 117 specimens with collection dates from May 21 to November 1. Males and females of this species have been collected at light.

Phytocoris adustus, new species

Figure 128

HOLOTYPE MALE: Lucerne, 550 m, Lake Co., California, 28 June 1966, ex. *Juniperus californica* Carr., C. W. O'Brien (UCB).

PARATYPES: CALIFORNIA. **Lake Co.:** 1 male, same data as holotype (OSU). **Tehema Co.:** 1 male, Red Bluff, 27 June 1935, R. H. Beamer (KU).

DIAGNOSIS: *Phytocoris adustus* is distinguished from other brown or gray species of the *juniperanus* group by the following characters of the male genitalia: left genital tubercle large, set with erect bristlelike setae dorsally, apex broadly rounded (fig. 128a); shaft of the left paramere gradually and narrowly expanded distally (fig. 128c); and left basal lobe of vesica without sclerite or field of small spines laterally. This species is further distinguished from *nigrisquamus* by the elongate, brown or dark brown medial patch on the clavus.

DESCRIPTION: *Male.* Length 4.32–4.54, width 1.53–1.57; pale grayish yellow ground color with fuscous markings. **Head:** width across eyes 0.78–0.83, vertex 0.34–0.36; pale yellow; jugum, lorum, and base of tylus with red to fuscous markings; frons moderately convex, with 6–8 dark striae laterally. **Rostrum:** length 1.98–2.16, reaching seventh or eighth abdominal segment. **Antennae:** brown to fuscous; I, length 0.85–0.93, with scattered pale spots on dorsal surface; II, length 1.73–2.09, with pale annulus medially; III, length 1.06–1.26; IV, length 0.67–0.79. **Pronotum:** mesal length 0.68–0.72, posterior width 1.24–1.28; disk pale grayish yellow or brownish yellow, lateral margins narrowly infuscated, posterior submargin with transverse fuscous line and 4–6 weakly elevated points; collar fuscous with pale, median spot; calli marked with reddish brown or fuscous; propleura pale, dorsal margin and anteromedial stripe fuscous. **Scutellum:** pale with dusky spot either side before apex. **Hemelytra:** grayish white or pale grayish yellow; clavus with elongate, fuscous patch medially; corium with large fuscous patch between anal ridge and radial vein, extending anteriorly along claval suture; outer margin of corium, and cuneus marked with fuscous; membrane moderately conspurcate.

Legs: femora white or pale yellow, marked with reddish brown or fuscous mostly on distal half; pattern on hind femora reticulate; tibiae pale with three dark annuli. **Vestiture:** dorsum with dark simple setae, broad black scalelike setae, and silvery white scalelike setae. **Genitalia:** Figure 128.

Female. Unknown.

ETYMOLOGY: From the Latin, *adustus* (tanned, brown), referring to the tawny brown general coloration.

DISCUSSION: *Phytocoris adustus* is known only from the type material collected in Lake and Tehema counties, California. The holotype and one paratype were collected on *Juniperus californica*.

Phytocoris albellus Knight

Figure 129

Phytocoris albellus Knight, 1934: 14, 15. – Carvalho, 1959: 189. – Knight, 1968: 225.

TYPES: Described from a single female collected at Payson, Gila Co., Arizona, 3 August 1929, E. D. Ball. The type is deposited in the Knight Collection (USNM).

DIAGNOSIS: Length 3.5–4.1. Recognized by the yellowish white dorsal coloration with collar, markings on calli, posterior submargin of pronotal disk, dorsal margin of propleuron, large fascia on corium between anal ridge and radial vein, and extreme apex of cuneus fuscous; antennal segment I black with four or five pale spots dorsally; hind femora uniformly pale, distal fourth sometimes with limited brown or fuscous markings dorsally; and male genitalia with these distinguishing characters: left genital tubercle tapered to narrow rounded apex, dorsal surface with moderately distributed, long bristlelike setae (fig. 129a); sclerotized process of vesica strongly flattened, without reflexed basilateral margins, or ridges distally (fig. 129e).

DISCUSSION: I have examined seven specimens of *albellus* from the following localities: ARIZONA: **Yavapai Co.:** 17 mi S of Bagdad at Jct. Rts. 93 and 97, 731 m (AMNH). CALIFORNIA: **San Diego Co.:** Jacumba (KU); 2 mi W of Mountain Springs (USNM). Collection dates are June 10 and August 2–23. The four specimens collected near Bagdad, Arizona, were swept from *Ju-*

niperus osteosperma (Torr.) Little. No other host plant records were given.

Phytocoris albifrons Knight

Figure 130

Phytocoris albifrons Knight, 1968: 241, 242.

TYPES: *Phytocoris albifrons* was described from a single female collected at Tucson, Pima Co., Arizona, 24 May 1924, A. A. Nichol. The type is deposited in the Knight Collection (USNM).

DIAGNOSIS: Length 3.7–4.3. This species is very similar to *brevicornis* and *breviusculus* but is distinguished by the following combination of characters: ratio of length of antennal segment I to width of head across eyes from 0.85:1 to 1.00:1 for males and 1.05:1 to 1.20:1 for females; second antennal segment fuscous with pale median annulus; scutellum evenly convex, not strongly deflexed apically as in *brevicornis*; and left genital tubercle of male broadly rounded (fig. 130a).

DISCUSSION: *Phytocoris albifrons* has been collected in Gila, Maricopa, Pima, and Yuma counties in Arizona. Two males from Maricopa County were taken on *Phoradendron californicum* Nutt. (mesquite mistletoe). I have examined 19 specimens with collection dates from April 26 to August 31.

Phytocoris brevicornis Knight

Figure 131

Phytocoris brevicornis Knight, 1968: 237, 238, fig. 304.

TYPES: Described from four specimens collected in Pima Co., Arizona. The male holotype and two paratypes were taken in Sabino Cyn., Santa Catalina Mts., 26 April 1916, J. F. Tucker. The allotype was collected at Tucson, 12 May 1929, by E. D. Ball. All type material is retained in the Knight Collection (USNM) except one paratype that was not located.

DIAGNOSIS: Length 3.9–4.8. *Phytocoris brevicornis* closely resembles *breviusculus* but differs by the brown to fuscous second antennal segment with pale median annulus, strongly convex scutellum that is abruptly deflexed apically, and by the structure of the male genitalia, especially the small left genital

tubercle (fig. 131a), more prominent sensory lobe of the left paramere (fig. 131b), right paramere with small protuberance on inner surface of arm, and vesica with a single sclerotized process (fig. 131e). *Phytocoris brevicornis* also resembles *albifrons* but is distinguished by the shorter first antennal segment, strongly convex scutellum, and narrow knob-like left genital tubercle. The ratio of length of antennal segment I to width of head across eyes is from 0.65:1 to 0.75:1 for males and from 0.75:1 to 0.95:1 for females.

DISCUSSION: The distribution of *brevicornis* includes most of Arizona and western New Mexico, east to Dona Ana and Socorro counties. Specimens also have been collected in Imperial, Riverside, San Bernardino, and San Diego counties, California, as well as Washington Co., Utah. I have examined several dozen specimens with collection dates from April 8 to October 17. Adults have been collected on *Acacia greggii* Gray. and *Prosopis juliflora* (Sw.)DC.

Phytocoris brevisculus Reuter

Figures 121, 132

Phytocoris brevisculus Reuter, 1876: 68; 1909: 21, 22. – Van Duzee, 1917a: 320. – Knight, 1927a: 44; 1941: 190, 191. – Froeschner, 1949: 183. – Carvalho, 1959: 193. – Knight, 1968: 225. – Wheeler and Henry, 1977: 639–641, 643, figs. 12, 13. – Henry and Stonedahl, 1983: 446.

TYPES: *Phytocoris brevisculus* was described from an unknown number of specimens collected in Texas. I have examined five specimens that appear to be from the original syntype series of this species. Two males and two females of this series are deposited in the Swedish Museum of Natural History, Stockholm, and a single female is deposited in the Zoological Museum, Helsinki, Finland. A male specimen from the SMNH was designated a lectotype by Henry and Stonedahl (1983).

DIAGNOSIS: Distinguished from other brown species of the *juniperanus* group by the absence of dark scalelike setae on the dorsum, and the uniformly brownish yellow second antennal segment, without pale median annulus. The left genital tubercle of the male is only sparsely set with bristlelike setae (fig. 132a) and the vesica possesses two sclero-

tized processes (fig. 132e, f), the left one somewhat straplike and broadly attached along lateral margins to the membranous sac of the vesica.

REDESCRIPTION: Length 3.9–4.6; yellowish brown general coloration with brown to fuscous markings; antennae brownish yellow, segment I with dark markings dorsally; frons weakly convex, with 5–7 reddish striae laterally; jugum, lorum, and tylus marked with reddish brown; disk yellowish brown, posterior submargin with transverse fuscous line and 4–6 weakly elevated points; collar and calli marked with red or reddish brown; propleura pale, dorsal two-thirds lightly infuscated; hemelytra yellowish brown with dark markings along claval vein, apex of clavus, and inner and apical margins of corium; basal third of corium with fuscous medial patch; cuneus marked with red, narrowly fuscous apically; membrane mottled with fuscous, outer margin with two pale spots; femora white or pale yellow with reddish brown or fuscous markings; distal half of hind femora extensively darkened and marked with pale spots; tibiae pale with fuscous spots and three or four dark annuli; dorsum with both silvery white and golden, sericeous setae but lacking scalelike setae.

DISCUSSION: *Phytocoris brevisculus* is widely distributed in the eastern United States from Kansas to Pennsylvania, south to Alabama, Mississippi, and Texas. Knight (1968) reported this species from Arizona, but it appears that these records pertain to the closely related species, *brevicornis*. *Phytocoris brevisculus* occurs on a wide variety of plants in the eastern United States, but is reported by Wheeler and Henry (1977) to be most common on *Juniperus* L. Knight (1927a) noted that *breviusculus* is attracted to light and later reported “mesquite” as the host plant of this species. Data collected in Missouri (Froeschner, 1949) and Pennsylvania (Wheeler and Henry, 1977) suggest that *breviusculus* is bivoltine with a range of occurrence from May to September. I have examined 65 specimens from Texas with collection dates from June 2 to August 3. Wheeler and Henry (1977) present evidence suggesting that *breviusculus* is at least partially predaceous on scale insects and mites.

Phytocoris cuneotinctus Knight

Figure 122, 133

Phytocoris cuneotinctus Knight, 1925a: 55, 56. – Carvalho, 1959: 196. – Knight, 1968: 216.

TYPES: Described from 30 specimens collected in southwestern New Mexico. The male holotype, allotype, and 24 paratypes were taken at Mesilla Park, Dona Ana Co., 12 July 1917, H. H. Knight. All specimens are retained in the Knight Collection (USNM), except one paratype that is deposited in the collection of UAZ and six paratypes that were not located.

DIAGNOSIS: Length 4.2–4.9. *Phytocoris cuneotinctus* is distinguished from other species of the *juniperanus* group by the pale green general coloration with small, dusky flecks on the hemelytra. Externally, this species is somewhat similar to *vanduzeei*, but differs by the dusky flecks on the hemelytra and longer first antennal segment; ratio of segment length to width of head across eyes from 0.85:1 to 1.00:1.

DISCUSSION: *Phytocoris cuneotinctus* has been collected in Arizona, California, Colorado, Nevada, New Mexico, Oregon, western Texas, and Utah. Specimens have been taken as far north as Harney Co., Oregon; east and south to Big Bend Nat. Pk., Brewster Co., Texas; and west to Inyo Co., California. The host plant of this species is *Atriplex*. I have examined 40 specimens with collection dates from June 15 to October 17.

Phytocoris hualapai, new species

Figure 134

HOLOTYPE MALE: Hualap[a]i Mts., SE of Kingman, T20N R15W, 4000–6000 ft (1220–1830 m), Mohave Co., Arizona, 9–10 June 1983, ex. *Holacantha emoryi* Gray., R. T. Schuh, M. D. Schwartz, and G. M. Stonedahl (AMNH).

PARATYPES: 1 female, same data as holotype (AMNH).

DIAGNOSIS: Recognized by the dark grayish brown general coloration, with pronotum entirely darkened, except narrow band along posterior margin of disk, and limited spots on calli pale; propleura mostly fuscous, apical third pale; dorsal width of eye of male ap-

proximately equal to width of vertex; rostrum reaching between hind coxae; and male genitalia with broad, moderately setose, and apically angulate left tubercle (fig. 134a), left basal lobe of vesica with field of small spines laterally, and vesica above left margin of gonopore with small, partly spinose membranous sac. Genital parameres and sclerotized process of vesica as in figure 134b–e.

DESCRIPTION: *Male.* Length 4.38, width 1.52; dark grayish brown general coloration. **Head:** width across eyes 0.92, vertex 0.31; white ground color with fuscous markings on jugum bordering antennal fossa, base and middle of tylus, and dorsal margin of lorum; vertex and frons mostly fuscous, spot on middle of vertex pale; frons moderately convex, more abruptly so apically, junction with tylus broadly depressed; eyes large, occupying three-fourths of head height; antennal fossa nearly contiguous with inner margin of eye, inserted below its midpoint. **Rostrum:** length 1.64, reaching between hind coxae. **Antennae:** dark reddish brown; I, length 0.78, with four or five pale spots and several erect, bristlelike setae dorsally; II, length 1.71, with pale annulus basally and lighter yellowish brown region medially; III, length 1.15, with pale annulus basally; IV, length 0.75 (teneral). **Pronotum:** mesal length 0.70, posterior width 1.32; disk dark grayish brown, posterior margin narrowly pale; medial spot on collar, and limited markings on calli white; propleura dark brown, apical third pale. **Scutellum:** weakly convex; creamy white with two darkened, parallel lines medially; lateral margins, except on apical fourth, broadly fuscous; mesoscutum fuscous, dorsolateral angles pale. **Hemelytra:** mostly dark grayish brown; clavus bordering commissure, middle and posteromedial regions of corium, and anterolateral margin of cuneus more grayish white; membrane densely conspurcate, veins pale except slightly darkened anteriorly. **Legs:** femora creamy white with dark reddish brown or fuscous markings mostly on distal two-thirds, hind pair more extensively darkened and marked with pale spots distally; tibiae pale, with fuscous markings and pale spots, front pair with four dark annuli including narrow band at base; tarsi brown or dark brown. **Vestiture:** dorsal vestiture as in ge-

neric description, with both pale and dark scalelike setae. **Genitalia:** Figure 134.

Female. Similar to male in color, vestiture, and structure, except eyes slightly smaller and vertex relatively broader. Length 4.50, width 1.62. **Head:** width across eyes 0.92, vertex 0.36. **Rostrum:** length 1.75, reaching between hind coxae. **Antennae:** I, 0.89; II, 2.00; III, 1.26; IV, 0.85 (teneral). **Pronotum:** mesal length 0.71, posterior width 1.38.

ETYMOLOGY: Named for its occurrence in the Hualapai Mts. of northwestern Arizona.

DISCUSSION: Known only from the holotype and single female paratype collected in Mohave County, Arizona. Both of these specimens were taken on crucifixion thorn, *Holacantha emoryi* Gray.

Phytocoris juniperanus Knight

Figures 117, 119, 124, 125, 135

Phytocoris juniperanus Knight, 1968: 238, 239, fig. 302.

Phytocoris chiricahuae Knight, 1968: 239, fig. 296.
NEW SYNONYMY.

Phytocoris flaviatus Knight, 1968: 241, fig. 297.
NEW SYNONYMY.

Phytocoris santaritae Knight, 1968: 245, fig. 294.
NEW SYNONYMY.

TYPES: *Phytocoris juniperanus* was described from eight male specimens collected near Mercury, Nye Co., Nevada (Nevada Test Site). The holotype and five paratypes were taken in Area 401 M, Nevada Test Site, 19 June 1965, ex. *Juniperus osteosperma* (Torr.) Little., H. Knight and J. Merino. All type material is retained in the Knight Collection (USNM) except one paratype deposited in the collection of BYU and one paratype that was not located.

The junior synonym, *chiricahuae*, was described from two male specimens collected in the Chiricahua Mts., 1890 m, Cochise Co., Arizona, 20 June 1928, A. A. Nichol. The holotype is retained in the Knight Collection (USNM); the paratype was not located.

The male holotype of *flaviatus* was taken at Grand Canyon, Coconino Co., Arizona, 6 September 1931, H. H. Knight. This specimen is retained in the Knight Collection (USNM).

The junior synonym, *santaritae*, was described from a single male collected in the

Santa Rita Mts., Santa Cruz Co., Arizona, 26 September 1925, A. A. Nichol. This specimen is deposited in the Knight Collection (USNM).

DIAGNOSIS: Distinguished from other gray or brown members of the *juniperanus* group by the pale ventral surface of antennal segment I, and the narrow tapered left genital tubercle of the male, with dense brush of dark bristlelike setae basally (fig. 135a). The ratio of length of antennal segment I to width of head across eyes is greater than 0.90:1 for males.

REDESCRIPTION: Length 3.8–4.8; grayish white ground color with fuscous markings; antennae brown or dark brown except segment I pale with fuscous markings on dorsal surface, segment II usually with pale annulus medially; frons moderately convex; pronotal disk grayish white or pale gray with dark, setose spots; posterior submargin of disk with transverse, fuscous line and 4–6 weakly elevated setose points; propleura pale, dorsal margin and median line fuscous; scutellum pale, usually with dark spot either side before apex; hemelytra grayish white, lightly to moderately marked with fuscous particularly along veins, at inner apical angle of corium, and on cuneus; femora white or pale yellow with brown to fuscous markings mostly on distal half; tibiae pale with dark spots, front and middle pairs with three or four dark annuli.

DISCUSSION: *Phytocoris juniperanus* is widely distributed in the western United States. I have examined 184 specimens from the following states: Arizona, California, Colorado, Nevada, New Mexico, Oregon, Texas, and Utah. Specimens have been collected as far north as Wasco Co., Oregon and Summit Co., Utah; east to Arapahoe Co., Colorado, and Bosque, Brazos, Burnet and Palo Pinto counties, Texas; and south to Cochise and Santa Cruz counties in Arizona. The western boundary of the distribution is formed by the Cascade Range and Sierra Nevada Mts. in the north and the Mojave and Sonoran deserts in the south. The only records of *juniperanus* in California are from Riverside and Shasta counties. The host plant of this species is *Juniperus* L.; adults have been collected on *J. monosperma* (Engelm.) Sarg., *J. osteosperma* (Torr.) Little., and *J. pachyphloea* Torr.

Males and females are attracted to light. Collection dates are from April 28 to September 23.

Phytocoris chiricahuae, *flaviatus*, and *santariitae* have been placed in synonymy with *juniperanus* on the basis of the nearly identical genitalic structures of the males. For each of these nominal species, the sclerotized process of the vesica is distinctly triangulate, which is unique to *juniperanus* (fig. 135e). Except for minor variation, the right and left parameres of these taxa are indistinguishable from those of the senior synonym. The external characteristics used by Knight (1968) to separate these four species display considerable intraspecific variation and do not represent species specific differences.

***Phytocoris latisquamus*, new species**

Figure 136

HOLOTYPE MALE: S[an] Francisquito Bay, Gulf [of] Cal[ifornia]., 23 June 1921, E. P. Van Duzee (CAS).

PARATYPES: 1 female, California Gulf, San Esteban Is., 19 April 1921, E. P. Van Duzee (CAS).

DIAGNOSIS: Distinguished from other members of the *juniperanus* group by the brown general coloration, without red markings on corium; propleura mostly fuscous, apical third pale; dorsal width of eye of male greater than width of vertex; and male genitalia with these distinguishing characteristics: left genital tubercle very broadly produced, apically truncate, with moderately distributed bristlelike setae dorsally (fig. 136a); left basal lobe of vesica with field of small spines laterally; vesica above left margin of gonopore with two small, basally confluent sclerites; parameres, and sclerotized process of vesica as in figure 136b–e.

DESCRIPTION: *Male.* Length 4.08, width 1.55; brown general coloration. **Head:** width across eyes 0.87, vertex 0.24; pale yellow with dark brown markings on vertex, frons, base and middle of tylus, and dorsal margin of jugum, lorum and buccula; frons moderately convex, more abruptly so distally, meeting tylus along broad depression; eyes large, occupying five-sixths of head height; antennal fossa nearly contiguous with inner margin of eye and inserted below its midpoint. **Ros-**

trum: length 1.62, reaching between hind coxae. **Antennae:** dark brown, first segment more reddish brown; I, length 0.78, with four or five pale spots and several erect, pale bristlelike setae dorsally and laterally; II, length 1.81, with pale annulus at base and middle; III, length 1.15, with pale annulus basally; IV, length 0.72. **Pronotum:** mesal length 0.72, posterior width 1.36; disk pale brownish yellow, tinged with brown especially along lateral margins; posterior submargin with wavy fuscous line, extreme margin pale; collar and calli tinged with red; propleura fuscous, apical third pale. **Scutellum:** weakly convex; brownish yellow with dark reddish brown, longitudinal line medially; mesoscutum moderately exposed, fuscous with dorsolateral angles pale. **Hemelytra:** creamy white, extensively tinged with brown but leaving inner apical half of clavus and posteromedial region of corium pale; outer half of clavus, embolium, inner posterior region of corium, and cuneus except for outer margin more extensively darkened with brown or fuscous; membrane densely conspurcate, veins pale, lightly marked with brown anteriorly. **Legs:** femora pale yellow with reddish brown or fuscous markings mostly on distal two-thirds, hind pair more extensively darkened and marked with pale spots distally; tibiae pale with fuscous markings, front pair with four dark annuli including narrow band at base; tarsi brown or dark brown. **Vestiture:** dorsal vestiture as in generic description, with both pale and dark scalelike setae. **Genitalia:** Figure 136.

Female. Similar to male in color, vestiture, and structure, except eyes slightly smaller and vertex relatively broader, rostrum longer, and pronotal disk somewhat shorter and narrower. Length 4.20, width 1.49. **Head:** width across eyes 0.81, vertex 0.32. **Rostrum:** length 1.91, reaching beyond apices of hind coxae. **Antennae:** I, 0.86; II, 1.80; III, 1.18; IV, missing. **Pronotum:** mesal length 0.62, posterior width 1.21.

ETYMOLOGY: From the Latin, *latus* (broad, flat) and *squama* (scale), referring to the broad scalelike setae on the dorsum.

DISCUSSION: Known only from the holotype and single female paratype collected in the Gulf of California, Mexico. The host plant association is not known.

Phytocoris miniatus Knight

Figure 137

Phytocoris miniatus Knight, 1961: 480, 481; 1968: 225.

TYPES: Described from seven specimens collected at Tucson, Pima Co., Arizona, 12 May 1929, E. D. Ball. The male holotype, allotype, and one male paratype are retained in the Knight Collection (USNM). The remaining four paratypes were not located.

DIAGNOSIS: *Phytocoris miniatus* is distinguished from other species of the *juniperanus* group by the following combination of characters: corium marked or tinged with red; scutellum mottled with red, but without distinct median line; first antennal segment with pale bristlelike setae dorsally; and left genital tubercle of male small, with sparsely distributed pale setae (fig. 137a). This species is most similar to *breviusculus* but differs by the smaller size, 3.3–3.9, reddish markings on the dorsum, and by the structure of the male genitalia, especially the small left genital tubercle (fig. 137a), and the shape of the sclerotized processes of the vesica (fig. 137e, f). *Phytocoris miniatus* also resembles *brevicornis* and *albifrons* but is easily distinguished from these species by the reddish markings on the dorsum, and uniformly brownish yellow second antennal segment, without pale median anulus.

DISCUSSION: I have examined several dozen specimens of *miniatus* from the following localities: ARIZONA. **Cochise Co.:** Huachuca Mts. (KU). **Gila Co.:** Apache Lk., 5.5 mi W Roosevelt Dam, 533 m (AMNH). **Mari-copa Co.:** Salt River Cyn., Apache Lk. (JTP). **Pima Co.:** Arivaca (KU). **Santa Cruz Co.:** Santa Rita Mts., 1220–1524 m (KU). **Yavapai Co.:** Milepost 164 on US Hwy. 93, 670 m (AMNH). Collection dates are from April 28 to June 10. Knight (1968) reports this species from St. George, Washington Co., Utah, 30 June 1965. Adults and nymphs of *miniatus* have been collected on *Phoradendron californicum* Nutt. (mesquite mistletoe).

Phytocoris monophyllae, new species

Figure 138

HOLOTYPE MALE: Pinyon Flat, San Jacinto Mts., Riverside Co., California, 1 September

1951, ex. *Pinus monophylla* Torr. & Frem., Timberlake (UCR; donated to the AMNH).

PARATYPES: CALIFORNIA. **Riverside Co.:** 1 male, San Bernardino Nat. For., Pinyon Flat Cmpgd. near Hwy. 74, 20–21 September 1975, J. D. Pinto (UCR). NEVADA. **Washoe Co.:** 1 female, 4 mi SE jct. Hwy. 395 on Hwy. 17, 11 August 1980, ex. *Pinus monophylla*, G. M. Stonedahl (OSU).

DIAGNOSIS: Similar to *albellus* and *juniperanus*, but distinguished by the pale dorsal margin of the propleuron; reddish tinge on distal half of cuneus; and structure of the male genitalia, especially the broadly produced, strongly tapered left genital tubercle with angulate apex (fig. 138a), and the large lance-shaped sclerotized process of the vesica with slightly reflexed basilateral margins and strong ridges distally (fig. 138e). Further distinguished from *albellus* by the moderately distributed, brown or fuscous markings on the hind femora, and from *juniperanus* by the shorter first antennal segment with ventral surface darkened, and the more sparsely distributed, pale setae on the left genital tubercle of the male. The ratio of length of antennal segment I to width of head across eyes is from 0.75:1 to 0.85:1 for males.

DESCRIPTION: *Male.* Length 4.16–4.48, width 1.31–1.39; pale grayish yellow general coloration. **Head:** width across eyes 0.76–0.78, vertex 0.31–0.32; pale yellow, lightly marked with red; frons weakly convex. **Rost- rum:** length 2.05, reaching well beyond apices of hind coxae. **Antennae:** I, length 0.61–0.63, dark reddish brown or fuscous with three large white patches on dorsal surface; II, length 1.66–1.73, brownish yellow, tinged with red; III, length 1.08–1.10, brown or yellowish brown; IV, length 0.65–0.68; brown. **Prono- tum:** mesal length 0.65, posterior width 1.13–1.15; disk pale grayish yellow, posterior submargin with transverse, fuscous line; collar and calli marked with red; propleura pale with reddish line across middle. **Scutellum:** pale yellow, lightly marked or tinged with red, and with faint dusky spot either side before apex. **Hemelytra:** pale grayish yellow; clavus, inner apical angle and basal third of corium, and apex of cuneus lightly to moderately marked with brown; cuneus tinged with red; membrane conspurcate, outer margin with two oblique pale marks. **Legs:** femora grayish

white or pale grayish yellow, lightly marked with reddish brown or fuscous, dark markings on hind pair forming two or three interrupted bands; tibiae pale with three dark annuli. **Vestiture:** dorsum with golden to dark brown simple setae, black scalelike setae, and narrow, silvery white scalelike setae. **Genitalia:** Figure 138.

Female. Similar to male in color, vestiture, and structure. Length 4.43, width 1.64. **Head:** width across eyes 0.84, vertex 0.36. **Rostrum:** length 2.07, reaching base of ovipositor. **Antennae:** I, 0.79; II, 1.98; III, missing; IV, missing. **Pronotum:** mesal length 0.71, posterior width 1.28.

ETYMOLOGY: Named for its host plant, *Pinus monophylla* Torr. & Frem.

DISCUSSION: *Phytocoris monophyllae* is known only from the type material taken in Riverside Co., California, and Washoe Co., Nevada. Although the holotype and female paratype were collected from *Pinus monophylla*, I would speculate that this species occurs more commonly on *Juniperus* L. in Pinon-Juniper woodland associations.

Phytocoris nigrisquamus, new species

Figure 139

HOLOTYPE MALE: Poway, Green Valley, San Diego Co., California, 12 June 1978, R. Kappel (SDNH).

PARATYPES: CALIFORNIA. **Contra Costa Co.:** 1 female, Briones Rd., N side of Briones Hills, 8 September 1970, R. M. Brown and J. Smith (CAS); 1 female, Mt. Diablo, 14 July 1916, E. P. Van Duzee (CAS); 1 male, 2 females, Mt. Diablo, east slope, 27 June 1931, R. L. Usinger (OSU, USNM). **Fresno Co.:** 1 female, Jacalitos Cyn., 5 mi S Coalinga, 16 July 1975, J. Doyen (UCB). **Marin Co.:** 6 males, 3 females, Cypress Ridge, 21 September 1930, E. P. Van Duzee (CAS, OSU). **Riverside Co.:** 1 male, Riverside, 19 June 1978, J. C. Hall (UCR). **Sacramento Co.:** 1 male, Sacramento, 17 June 1968 (OSU). **San Diego Co.:** 1 male, 2 females, same data as holotype (SDNH); 1 male, Little Cedar Cyn., 16 June 1978 (SDNH). **Santa Cruz Co.:** 1 male, Santa Cruz Mts., 13 August 1938, R. I. Sailer (KU).

DIAGNOSIS: *Phytocoris nigrisquamus* is distinguished from other species of the *juniperanus* group by the following combination of

characters: hemelytra grayish yellow with brown to fuscous markings but leaving clavus uniformly pale, or sometimes lightly tinged with brown; propleura mostly pale, dorsal margin and anteromedial spot or stripe crossing coxal cleft reddish brown or fuscous; left genital tubercle of male large, broadly rounded, set with long, pale setae dorsally (fig. 139a); shaft of left paramere abruptly and broadly expanded distally (fig. 139c); and left basal lobe of vesica with small sclerite laterally.

DESCRIPTION: **Male.** Length 4.16–4.75, width 1.48–1.55; grayish yellow ground color with reddish brown to fuscous markings. **Head:** width across eyes 0.76–0.82, vertex 0.30–0.33; pale yellow; jugum, lorum, and base of tylus marked with red or reddish brown; frons moderately convex, sometimes lightly marked with red. **Rostrum:** length 1.98–2.11, reaching well beyond apices of hind coxae. **Antennae:** I, length 0.77–0.94, fuscous with pale spots; II, length 1.78–1.89, brown or yellowish brown with pale, median annulus; III, length 1.08–1.15, brown or dark brown; IV, length 0.85, brown or dark brown. **Pronotum:** mesal length 0.63–0.76, posterior width 1.15–1.26; disk grayish white, posterior submargin with transverse fuscous line and 4–6 weakly elevated points; collar reddish brown to fuscous with pale spot medially; calli marked or tinged with red or brown; propleura pale, anterior margin with reddish brown or fuscous mark crossing coxal cleft. **Scutellum:** pale with dusky spot either side before apex. **Hemelytra:** pale grayish yellow; corium with fuscous patch between anal ridge and radial vein, sometimes extending anteriorly along claval suture; inner margin and apex of cuneus marked with fuscous; membrane densely conspurcate. **Legs:** femora white or pale yellow with red to fuscous markings mostly on distal half; hind femora more extensively darkened apically; tibiae pale with fuscous spots, front pair with three dark annuli, middle and hind pairs sometimes annulated. **Vestiture:** dorsum with dark simple setae, black scalelike setae, and silvery white scalelike setae. **Genitalia:** Figure 139. Left genital tubercle of male large and broadly rounded; set with long pale setae on dorsal surface (fig. 139a).

Female. Similar to male in color, vestiture, and structure. Length 4.27–4.64, width 1.44–

1.62. **Head:** width across eyes 0.76–0.81, vertex 0.34–0.40. **Rostrum:** length 2.02–2.18, reaching base of ovipositor. **Antennae:** I, 0.85–0.94; II, 1.85–2.09; III, 1.13–1.15; IV, 0.80–0.90. **Pronotum:** mesal length 0.61–0.70, posterior width 1.13–1.33.

ETYMOLOGY: From the Latin, *niger* (black) and *squama* (scale), referring to the dark scalelike setae on the dorsum.

DISCUSSION: This species is known only from the type material collected mostly in southwestern California. The northernmost records are from Marin and Sacramento counties, and the southern limit of the distribution is in San Diego County. The host plant is not known, but I would speculate that *nigrisquamus* occurs on *Juniperus* L. or a related member of the family Cupressaceae, possibly *Cupressus* L.

Phytocoris occidentalis Stonedahl

Figure 140

Phytocoris occidentalis Stonedahl, 1984: 50–52, figs. 5–7.

TYPES: Described from 17 specimens collected 4 mi NE of Cave Jct. on US Hwy. 199, Josephine Co., Oregon, 8 and 24 August 1979, ex. *Pinus ponderosa* Dougl., G. M. Stonedahl. The male holotype and two paratypes are deposited in the collection of the USNM, a pair each are deposited in the collections of the AMNH and CAS, and 10 paratypes are retained in OSU collection.

DIAGNOSIS: *Phytocoris occidentalis* is very similar to *adenostomae* but differs by the larger size, 4.4–5.8; pale bristlelike setae on the first antennal segment; and by the more sparsely distributed, pale setae on the left genital tubercle of the male (fig. 140a). The larger size distinguishes this species from *acaciae* and *miniatus*.

DISCUSSION: *Phytocoris occidentalis* is widely distributed along the west coast of North America from Goldstream, British Columbia to San Diego Co., California. Specimens have been collected as far east as Grant Co., Oregon, and the Cascade Range and Sierra Nevada Mts. in California. This species also occurs in the western mountain ranges of southern California. Adults have been collected on *Pinus attenuata* Lemmon, *P. contorta* Dougl., *P. ponderosa* Dougl., *P. radiata*

D. Don., and *P. sabiniana* Dougl. I have examined 75 specimens with collection dates from May 2 to October 1.

Phytocoris polhemusi, new species

Figure 141

HOLOTYPE MALE: Stonewall, 8000 ft (2438 m), Las Animas Co., Colorado, 28 July 1982, "mixed Pinyon and Ponderosa," J. T. Polhemus (USNM).

PARATYPES: ARIZONA. Coconino Co.: 1 male, William[s], 10 July 1918, A. Wetmore (USNM). COLORADO. Las Animas Co.: 1 male, same data as holotype, (JTP); 1 female, Stonewall [near] Trinidad, 2590 m, 7 August 1925, H. H. Knight (USNM). NEW MEXICO. San Miguel Co.: 1 female, Las Vegas HS, August 5, H. S. Barber (USNM). Torrance Co.: 1 male, Tajique, 20 July 1930, J. G. Shaw (AMNH). UTAH. Washington Co.: 1 male, 1 female, Zion Nat. Pk., 4 August 1929, C. C. Searl (AMNH, USNM).

DIAGNOSIS: Recognized by the brownish orange general coloration with red markings on head, first antennal segment, cuneus, and legs; posteromedial angle of corium, inner anterior margin of cuneus, and sometimes anal ridge creamy white; length of antennal segment I less than dorsoventral height of eye; hemelytra with silvery white, sericeous setae and golden, sericeous setae; and structure of the male genitalia, especially the vesica with two sclerotized processes (fig. 141e, f).

DESCRIPTION: *Male.* Length 4.40–5.60, width 1.47–1.65; pale brownish orange general coloration; first antennal segment, cuneus, and legs marked with red or reddish brown. **Head:** width across eyes 0.91–1.02, vertex 0.34–0.35; white ground color, except vertex and base of frons brownish orange; tylus laterally, base of jugum, lorum, and tylus marked with red; frons weakly convex, meeting tylus along broad depression, marked with five or six faint red striae laterally; eyes occupying approximately three-fourths of head height; antennal fossa nearly contiguous with inner margin of eye and inserted below its midpoint. **Rostrum:** length 2.15–2.45, reaching sixth or seventh abdominal segment. **Antennae:** I, length 0.46–0.56, creamy white with red spots and several erect, pale, bristlelike setae dorsally; II, length 1.62–2.23,

yellowish brown; III, length 1.04–1.25, brown or yellowish brown; IV, length 0.76–0.89, brown or yellowish brown. **Pronotum:** mesal length 0.67–0.77, posterior width 1.23–1.42; disk uniformly brownish yellow or pale brownish orange; propleura brownish orange, sometimes lightly tinged with red, apical third white. **Scutellum:** uniformly brownish orange; mesoscutum moderately exposed. **Hemelytra:** clavus and corium uniformly brownish orange, embolium sometimes lighter yellowish orange; cuneus tinged with red; posteromedial angle of corium and inner anterior margin of cuneus creamy white with two setose fuscous spots bordering membrane; membrane smoky, with moderately to densely distributed, darker fuscous spots, veins orange or reddish orange. **Legs:** femora creamy white with red or reddish brown, reticulate markings, mostly on apical two-thirds; hind femora more extensively reddened distally and marked with pale spots; tibiae pale, lightly marked with red, especially on basal half, without distinct annuli; tarsi yellowish brown. **Vestiture:** dorsum with golden to brown simple setae, and both golden and silvery white, scalelike setae. **Genitalia:** Figure 141.

Female. Similar to male in color, vestiture, and structure, except eyes slightly smaller and vertex relatively broader. Length 5.35–5.70, width 1.78–1.89. **Head:** width across eyes 0.99–1.04, vertex 0.45–0.47. **Rostrum:** length 2.45–2.64, reaching base of ovipositor or slightly beyond. **Antennae:** I, 0.52–0.60; II, 1.84–2.19; III, 1.21–1.36; IV, 0.88–0.89. **Pronotum:** mesal length 0.78–0.82, posterior width 1.42–1.51.

ETYMOLOGY: Named for Dr. John T. Polhemus, who supplied many specimens for this study, including the holotype of this species.

DISCUSSION: This species has been collected in Arizona, southern Utah, southern Colorado, and New Mexico. The holotype and one paratype were collected on *Pinus* (*P. edulis* Engelm. and/or *P. ponderosa* Dougl. according to the label data accompanying the specimens). Collection dates are from July 10 to August 7.

Phytocoris polhemusi is very similar to *comulus*, a member of the *fraterculus* group also inhabiting *P. edulis* and *P. ponderosa*. The former species is easily distinguished from

comulus by the pale bristlelike setae on antennal segment I; pale simple setae on the dorsum; uniformly brownish orange clavus and corium; longer rostrum; and by the structure of the male genitalia (compare figs. 63 and 141). *Phytocoris comulus* has dark bristlelike setae on antennal segment I and the dorsal surface of the body; the corium and clavus distinctly marked or tinged with red; and the rostrum reaching only to the apices of the hind coxae or slightly beyond.

Phytocoris sangabriel, new species

Figure 142

HOLOTYPE MALE: Tanbark Flat, Los Angeles Co., California, 9 July 1950, A. T. McClay (UCD).

PARATYPES: 1 male, same data as holotype except 12 July 1950 (UCD).

DIAGNOSIS: Most similar to *hualapai* and *latisquamus*, but distinguished by the broad vertex (dorsal width of eye of male distinctly less than width of vertex); rostrum reaching base of ninth abdominal segment or nearly so; and structure of the male genitalia, especially the large left genital tubercle with broadly truncate apex (fig. 142a), the long shaft of the right paramere (fig. 142d), and the more strongly flattened and distally broadened sclerotized process of the vesica (fig. 142e). *Phytocoris sangabriel* is distinguished from the remaining species of the *juniperanus* group by the predominantly fuscous propleura with apical third pale; first antennal segment with short, reclining setae ventrally; left genital tubercle of male with moderately distributed, bristlelike setae dorsally; and left basal lobe of vesica with field of small spines laterally.

DESCRIPTION: *Male.* Length 4.65–4.80, width 1.62–1.70; brown general coloration. **Head:** width across eyes 0.86–0.88, vertex 0.36–0.38; creamy white with fuscous markings on vertex, frons, and base of tylus; jugum, lorum, and medial region of tylus with red or reddish brown markings; frons moderately convex, meeting tylus along broad depression; eyes large, occupying approximately three-fourths of head height; antennal fossa nearly contiguous with inner margin of eye, inserted below its midpoint. **Rostrum:** length 2.52–2.61, reaching base of genital

capsule or nearly so. **Antennae:** brown or dark brown; I, length 0.91, with pale spots and several erect bristlelike setae dorsally and laterally; II, length 2.11, with pale band at base and middle; III, length 1.15–1.32, with pale band at base; IV, length 0.96. **Pronotum:** mesal length 0.73–0.75, posterior width 1.40–1.48; disk pale yellow with brownish tinge, more extensively darkened laterally and with wavy fuscous line on posterior submargin, extreme posterior margin narrowly pale; collar tinged with red or reddish brown either side of middle; propleura dark brown, apical third pale. **Scutellum:** creamy white with broad longitudinal fuscous line medially, and dark transverse line below middle, giving the appearance of a cross; mesoscutum moderately exposed, mostly fuscous. **Hemelytra:** creamy white or pale yellow, moderately to extensively darkened with brown or dark brown but leaving clavus bordering commissure, and large patches at middle and apex of corium pale; membrane densely conspurcate, veins pale or slightly darkened anteriorly. **Legs:** femora white with reddish brown or fuscous markings mostly on distal two-thirds, hind pair more extensively darkened and marked with pale spots; tibiae pale with fuscous markings, front pair with four dark annuli including narrow band at base; tarsi brown or dark brown. **Vestiture:** dorsum with dark brown simple setae, narrow, silvery white scalelike setae, and broad, black scalelike setae. **Genitalia:** Figure 142.

Female. Unknown.

ETYMOLOGY: Named for its occurrence in the San Gabriel Mts. of southwestern California.

DISCUSSION: *Phytocoris sangabriel* is known only from the holotype and single paratype collected in the San Gabriel Mts., Los Angeles Co., California. The female and host plant association are not known.

Phytocoris tricinctus Knight

Figures 116, 123, 143

Phytocoris tricinctus Knight, 1968: 256, fig. 315.

TYPES: Described from 13 specimens collected in Pima and Pinal counties, Arizona. The male holotype and nine paratypes were taken at Superior, Pinal Co., 1 August 1930, E. D. Ball. The holotype, allotype, and seven

paratypes are retained in the Knight Collection (USNM). One paratype is deposited in the collection of BYU and four paratypes were not located.

DIAGNOSIS: Length 4.0–4.6. *Phytocoris tricinctus* is similar to *ventralis* but differs by the brownish general coloration; abdomen without black longitudinal line laterally; and left genital tubercle with densely distributed, dark, bristlelike setae dorsally (fig. 143a). The shaft of the left paramere is only slightly expanded distally (fig. 143c), and the sensory lobe (fig. 143b) is less prominent than for *ventralis*. Also, the left basal lobe of the vesica has an elongate patch of spinulae not found on *ventralis*.

DISCUSSION: This species is known from Cochise, Gila, Maricopa, Pima, Pinal, and Santa Cruz counties in Arizona. Adults have been collected on *Rhus microphylla* Engelm. Several specimens also were collected near Moctezuma, Chihuahua, Mexico on *Rhamnus* sp. I have examined several dozen specimens with collection dates from April 27 to November 16. Males and females have been taken at night on white sheets illuminated by mercury vapor lamps.

Phytocoris vanduzeei Reuter

Figures 120, 144

Lygus vividus Uhler, 1894: 260, 261 (preoc. by *Lygaeus vividus* Fabricius 1803: 235; see Stål 1868: 87). – Van Duzee, 1917a: 344 (cat.).

Phytocoris vividus: Knight, 1917: 640 (n. comb. for *Lygus vividus* Uhler); 1968: 216.

Dichrooscytus marmoratus Van Duzee, 1910: 78, 79 (preoc. by *Phytocoris marmoratus* Douglas and Scott 1869: 261). – Henry and Stonedahl, 1983: 461 (lectotype designation).

Phytocoris vanduzeei Reuter, 1912: 30 (n.n. for *Dichrooscytus marmoratus* Van Duzee). – Van Duzee, 1912: 512; 1917a: 320 (cat.); 1923: 149. – Knight, 1917: 640 (syn.); 1968: 217. – Carvalho, 1959: 220. – Henry and Stonedahl, 1983: 461.

Phytocoris nigripubescens Knight, 1925a: 55. – Carvalho, 1959: 208. – Knight, 1968: 216. – Henry and Stonedahl, 1983: 462 (syn.).

TYPES: *Lygus vividus* was described from a single male specimen collected at Comondú, Baja California Sur, March 1889, C. D. Haines. It is deposited in the collection of the CAS (type number 561) and bears a red lec-

totype label, which was probably added by E. P. Van Duzee. This specimen is correctly recognized as a holotype, because it appears to be the only insect on which the original description was based (see Uhler, 1894).

Dichrooscytus marmoratus was described from an unknown number of specimens collected at Alamogordo, Otero Co., New Mexico. I have examined 16 specimens from the original syntype series with collection dates from 8 April to 10 May 1902. Fifteen of these specimens are tagged with orange paratype labels, which were apparently added by E. P. Van Duzee after publication of the original description. The remaining specimen (female, CAS) bears a red "allotype" label and a second red label reading "TYPE." These labels also appear to have been added by Van Duzee, but with no published record of a type designation for the species. A male specimen from the syntype series was designated a lectotype by Henry and Stonedahl (1983). The lectotype and 13 paralectotypes are retained in the Van Duzee Collection (CAS) and two paralectotypes are deposited in the collection of the USNM.

The junior synonym, *nigripubescentis*, was described from seven specimens collected at Tucson, Pima Co., Arizona, 5 April–3 May 1924, A. A. Nichol. The male holotype (5 April), allotype, and one female paratype are retained in the Knight Collection (USNM). Two paratypes are deposited in the collection of the UAZ, one paratype is deposited in the collection of the CAS, and one paratype was not located.

DIAGNOSIS: Length 4.2–5.7. Recognized by the yellowish green to bright green general coloration and short first antennal segment; ratio of segment length to width of head across eyes from 0.40:1 to 0.60:1. The left genital tubercle of the male is well developed (fig. 144a) and the shaft of the left paramere is abruptly expanded distally (fig. 144c). The vesica has a single elongate sclerotized process originating near the apex of the basal process (fig. 144e).

DISCUSSION: *Phytocoris vanduzeei* is widely distributed in the southwestern United States and northern Mexico, where it occurs on *Larrea divaricata* Cav. Specimens have been collected as far north as Inyo Co., California; Nye Co., Nevada; and Washington Co., Utah.

It is found throughout much of Arizona, New Mexico, and western Texas, east to Laredo in Webb County. The southern coast ranges form the western boundary of the distribution in California. I have examined 900 specimens with collection dates from January 6 to December 17.

Lygaeus vividus was described by Fabricius (1803) and moved to the genus *Phytocoris* by Stål (1868). *Lygus vividus* was described by Uhler (1894) and moved to the genus *Phytocoris* by Knight (1917). As a result of these actions, the names *vividus* (Fabricius) and *vividus* (Uhler) were brought together in secondary homonymy.

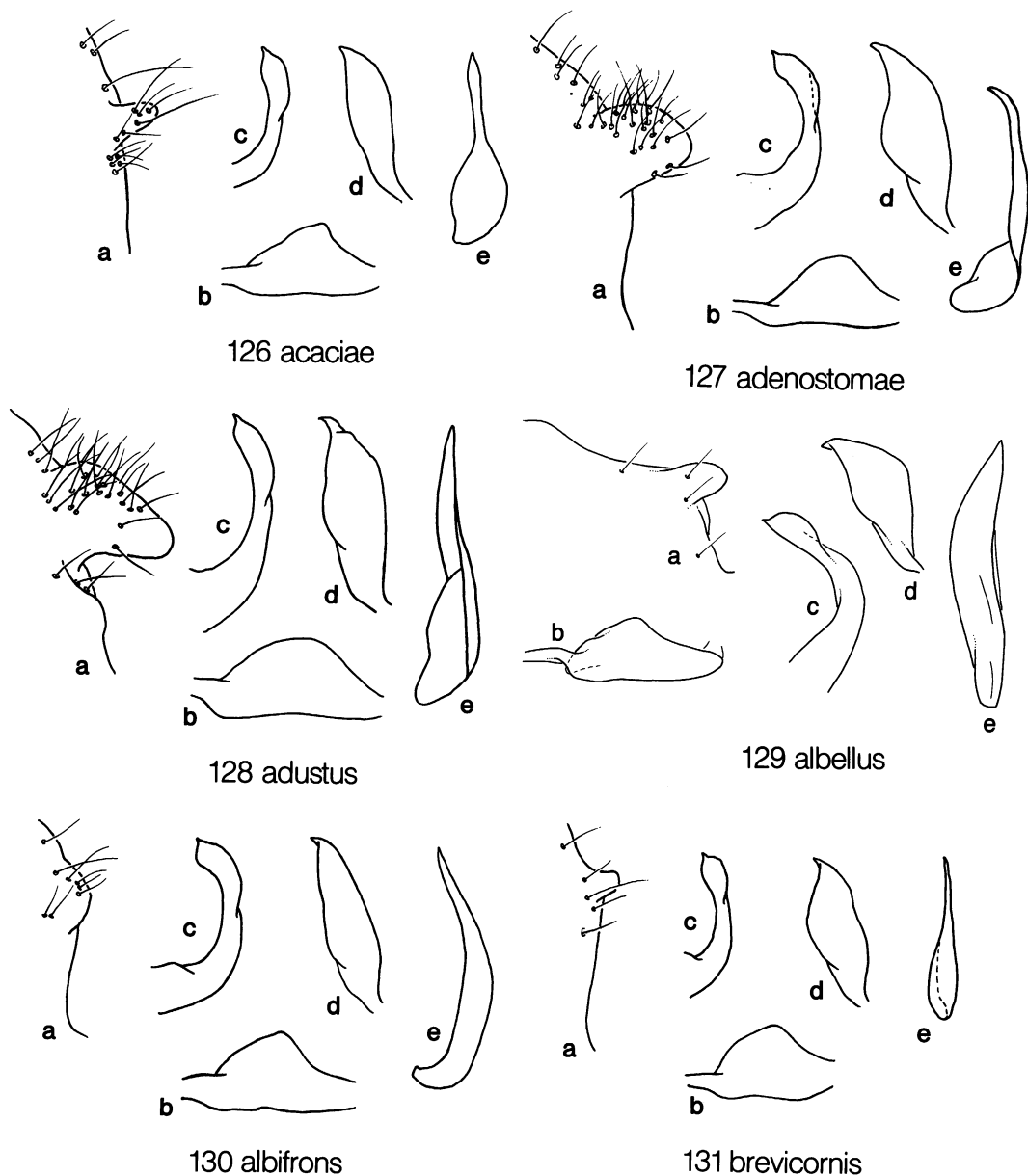
Dichrooscytus marmoratus was described by Van Duzee (1910) and moved to the genus *Phytocoris* by Reuter (1912). At this time, Reuter proposed the new specific name, *vanduzeei*, because the combination, *Phytocoris marmoratus*, was preoccupied by a European species (Douglas and Scott, 1869). *Phytocoris vanduzeei* Reuter was placed in synonymy with *vividus* (Uhler) by Knight (1917). Since *vividus* (Uhler) is clearly a junior secondary homonym, the name must be rejected and *vanduzeei* becomes the next available name by priority.

Phytocoris vanduzeei and *vividus* (Uhler) were once again recognized as distinct species by Knight (1968) in the Nevada Test Site study. Knight presents characters to distinguish these species but does not discuss his earlier synonymy of *vanduzeei*. I have examined type material of both nominal taxa and believe that they are conspecific (Henry and Stonedahl, 1983).

Phytocoris ventralis Van Duzee
Figures 118, 145

- Phytocoris ventralis* Van Duzee, 1918: 287, 288.
– Carvalho, 1959: 220. – Knight, 1968: 216.
Phytocoris ephedrae Knight, 1961: 478, 479, fig. 2; 1968: 216. NEW SYNONYMY.
Phytocoris quadricinctus Knight, 1968: 256, 257, fig. 316. NEW SYNONYMY.
Phytocoris contrastus Knight, 1968: 259, fig. 318. NEW SYNONYMY.

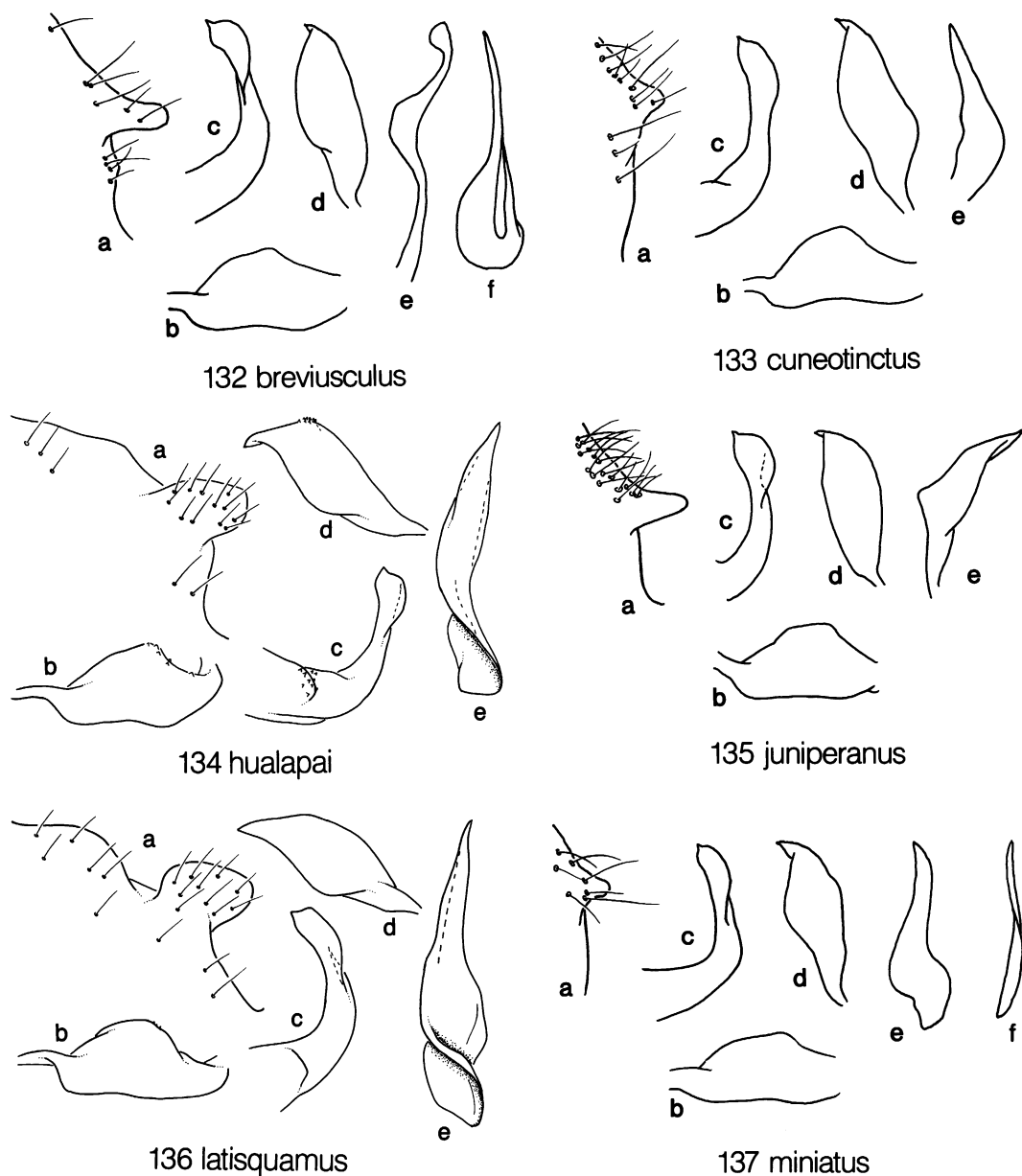
TYPES: *Phytocoris ventralis* was described from three specimens collected 7 mi W of Coachella, Riverside Co., California, 16 May 1917, taken on "palo-verde," E. P. Van Duzee. The female holotype (no. 406), allotype



Figs. 126–131. Male genitalia of *juniperanus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

(no. 407), and female paratype are deposited in the Van Duzee Collection (CAS). The allotype of *ventralis* is not conspecific with the holotype. This specimen is teneral and in somewhat poor condition, but I believe it to be an example of *brevicornis*.

The junior synonym, *ephedrae*, was described from 10 specimens collected in southeastern Arizona and western Texas. The male holotype was taken at Bowie, Cochise Co., Arizona, 15 July 1917, H. H. Knight. All type material is retained in the Knight Collection

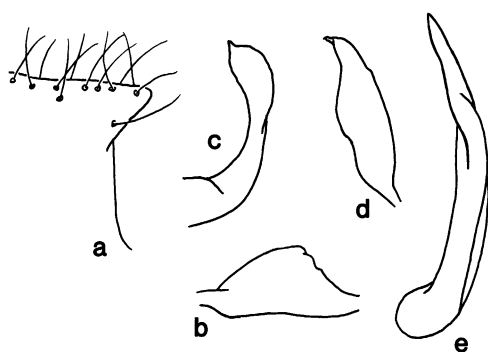


Figs. 132–137. Male genitalia of *juniperanus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica, or left sclerotized process for *breviusculus* and *miniatus*. f. Right sclerotized process of vesica for *breviusculus* and *miniatus*.

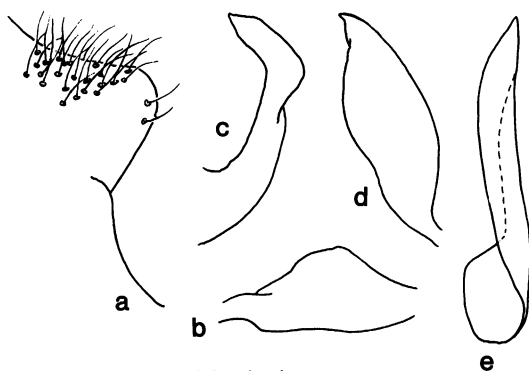
(USNM) except three paratypes that were not located.

Phytocoris quadricinctus was described from five specimens collected in Gila Co., Arizona and Brewster Co., Texas. The male

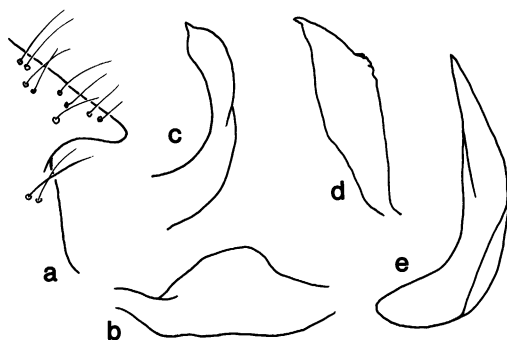
holotype, allotype, and two female paratypes were taken in the Salt River Mts., 396 m, Gila Co., Arizona, 9 May 1926, ex. *Lycium* sp., A. A. Nichol. All type material is deposited in the Knight Collection (USNM) ex-



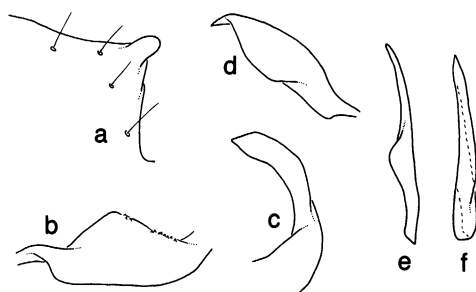
138 monophyllae



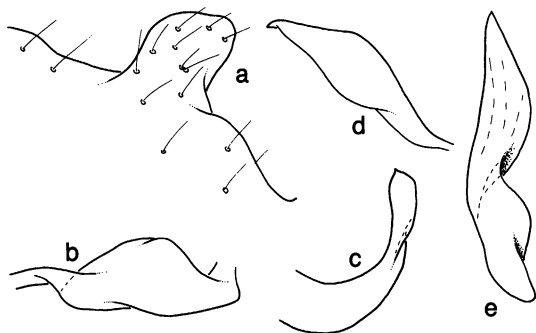
139 nigrisquamus



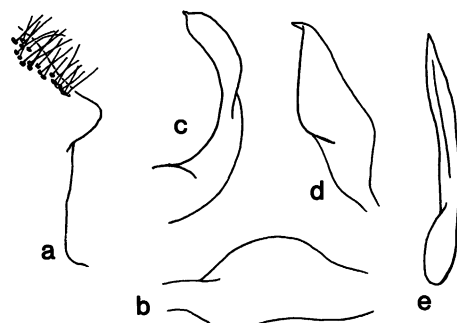
140 occidentalis



141 polhemusi



142 sangabriel



143 tricinctus

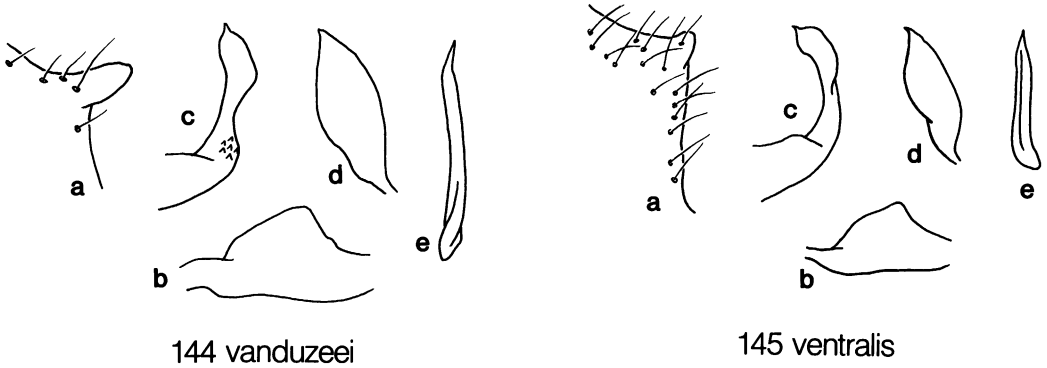
Figs. 138–143. Male genitalia of *juniperanus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica, or left sclerotized process for *polhemusi*. f. Right sclerotized process of vesica for *polhemusi*.

cept one female paratype that was not located.

The junior synonym, *contrastus*, was described from four specimens collected near Mercury, Nye Co., Nevada (Nevada Test Site). The male holotype, allotype, and one

male paratype were taken in Area 5M (TB), Nevada Test Site, 19 July 1965, E. Beck and J. Merino. All type material is retained in the Knight Collection (USNM) except one male paratype that was not located.

DIAGNOSIS: *Phytocoris ventralis* is distin-



Figs. 144, 145. Male genitalia of *juniperanus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

guished from other species of the *juniperanus* group by the grayish white general coloration; brush of long, pale setae on ventral surface of antennal segment I (fig. 118); and the dark line on each side of the abdomen.

REDESCRIPTION: Length 3.8–5.1; grayish white or yellowish gray general coloration; antennae pale, segments III and IV, and apical third of segment II fuscous; segment I with brush of long pale setae on ventral surface; segment II sometimes divided by dark annuli; frons weakly convex; tylus strongly produced at base; pronotal disk gray, posterior submargin with transverse fuscous band or series of fuscous spots, rarely without dark markings; collar and calli marked with fuscous; propleura pale, anterior margin sometimes marked with fuscous; hemelytra grayish white or pale yellowish gray, lightly marked with fuscous along veins, rarely more extensively darkened; cuneus narrowly fuscous at apex; membrane lightly to moderately sprinkled with dark spots; femora grayish white or pale grayish yellow, apical third marked with fuscous especially along anterior margin; tibiae pale, narrowly darkened basally; front tibiae with three, sometimes obscured, dark annuli; abdomen with black, longitudinal line on each side extending through eighth segment.

DISCUSSION: This species is widely distributed in the southwestern United States where it occurs most commonly on *Ephedra*. Specimens have been collected as far north as Inyo Co., California; White Pine Co., Nevada; and

Millard Co., Utah. It is distributed throughout Arizona and New Mexico, and also occurs in western Texas. The westernmost records are from Anza-Borrego Desert St. Pk., San Diego Co., California. Adults have been collected from *Ephedra nevadensis* Wats., *E. torreyana* Wats., *E. trifurca* Torr., *Lycium andersonii* Gray., and *L. berlandieri* Dunal. var. *parviflorum* (Gray) Terrac. Van Duzee (1918) collected the type series of this species on "palo-verde." Males and females are attracted to light. I have examined 160 specimens with collection dates from April 28 to September 28.

Phytocoris contrastus, *ephedrae*, and *quadricinctus* are here placed in synonymy with *ventralis* on the basis of the indistinguishable genitalic structures of the males. The holotypes of *contrastus* and *quadricinctus* differ from typical *ventralis* only by the darker general coloration. These specimens have dark annuli on the second antennal segment, which caused Knight (1968) to place them in a different species-group from *ventralis*. I have examined additional dark-colored specimens from Arizona, but they are relatively uncommon in collections. The holotype of *ephedrae* is nearly identical to the male allotype of *ventralis*. The characters provided by Knight (1961) to distinguish these two nominal species are subject to variation and are not consistent with his identifications of specimens collected at the Nevada Test Site (Knight, 1968).

LASIOMERUS SPECIES-GROUP

DIAGNOSIS: Recognized by the moderate to large body size; brown or reddish brown general coloration; thickened first antennal segment with densely distributed, erect, bristle-like setae (fig. 146); and structure of the male genitalia, especially the comblike sclerotized process of the vesica broadly attached to right lobe of primary membranous sac, and right basal lobe of vesica with sclerotized outer surface.

DESCRIPTION: Moderate to large, 6.5–8.4, brown or reddish brown species; dorsum with suberect, golden to dark brown, simple setae and silvery white, sericeous setae. **Head:** subquadrate to slightly elongate with moderately convex frons and broadly developed gular region; antennae pale yellow to yellowish brown; thickness of segment I two to three times that of segment II; length of segment I greater than width of head across eyes, with densely distributed, erect, black, bristlelike setae; frons sometimes slightly deflexed distally, meeting tylus along broad, shallow depression, with six or seven reddish striae laterally; eyes elliptical to slightly reniform, occupying about four-fifths of head height in lateral view. **Pronotum:** disk pale yellow or yellowish gray with red to fuscous markings; lobes separated by deep furrow behind prominent calli; propleura yellowish brown or reddish brown, apical third pale. **Hemelytra:** pale yellow with red to fuscous markings; apex and inner margin of cuneus mostly red or reddish brown, cuneus extensively reddened in *rubropictus*; membrane moderately to densely marbled with brown or fuscous, veins red. **Legs:** femora pale yellow or brownish yellow with limited red or reddish brown markings; hind femora with more extensive reticulate pattern of reds; tibiae pale yellow, sometimes narrowly darkened apically; hind tibiae marked with reddish brown basally. **Male genitalia:** genital capsule, except *pallidicornis*, with well developed tubercle above base of left paramere. **Left paramere:** sensory lobe moderately produced; shaft slightly to moderately expanded distally in dorsal view; apex narrowly rounded. **Right paramere:** elongate or narrowly lanceolate; slightly expanded distally in dorsal view; apex blunt,

sometimes with short process. **Vesica:** primary membranous sac well developed, multilobed, extreme right lobe with broad lateral attachment to sclerotized process; outer surface of right basal lobe weakly sclerotized, basal process well sclerotized, extending slightly beyond level of gonopore, greatly expanded apically; sclerotized process comblike, usually with 20–25 small toothlike serrations, inner margins of process, except distally, weakly sclerotized and appearing continuous with right membranous lobe.

DISCUSSION: The *lasiomerus* group comprises three species, two with transcontinental distributions in southern Canada and the northern United States and one known only from Maine and New York. They are reported to be inhabitants of herbaceous plants (Knight, 1923; Kelton, 1980), but specific host plant records are lacking.

Based on external morphology, particularly the head structure, and dorsal vestiture, *lasiomerus* group species appear closely related to members of the *cunealis* and *roseipennis* groups. However, certain genitalic structures of the male (i.e., broadly attached, comblike sclerotized process of the vesica and partly sclerotized right basal lobe of the vesica) are more similar to those possessed by *tiliae* group species. The similarities in male genitalia may be the result of convergence from what is believed to be the more plesiomorphic condition of narrowly attached, nonserrate sclerotized processes and non-sclerotized basal lobes (Schwartz, 1987). However, it is not unreasonable to accept the hypothesis that *lasiomerus* group species, which have northern Nearctic distributions, actually are more closely related to native Palearctic species (*tiliae* group) than they are to other Nearctic *Phytocoris*.

KEY TO SPECIES OF THE LASIOMERUS GROUP

- 1 Antennal segment II yellow or brownish yellow, apical fourth to one-third dark brown or black *lasiomerus* Reuter
- Antennal segment II uniformly yellow, sometimes darker yellowish brown at ex-

treme apex but never dark brown or black

- 2
 2(1) Scutellum with red markings; genital capsule swollen dorsad of base of left paramere but without prominent tubercle (fig. 149a); length 6.5–7.4 *pallidicornis* Reuter
 Scutellum uniformly pale yellow, without red markings; genital capsule with large tubercle dorsad of base of left paramere (fig. 150a); length 7.4–8.2 *rubropictus* Knight

Phytocoris lasiomerus Reuter

Figures 146–148

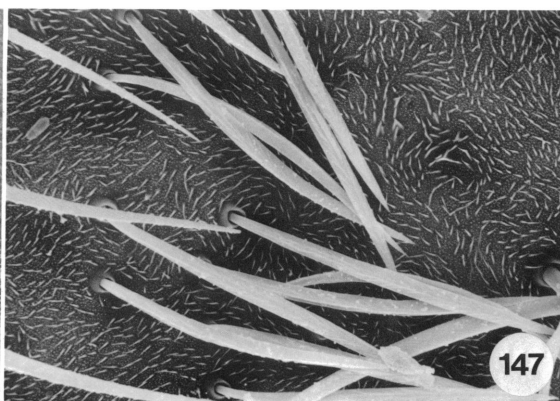
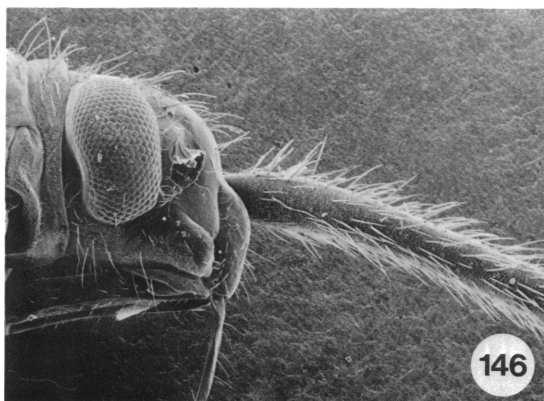
Phytocoris lasiomerus Reuter, 1909: 34. – Van Duzee, 1917a: 316. – Knight, 1923: 617, 618. – Blatchley, 1926: 702, fig. 167a. – Knight, 1941: 185, fig. 173. – Carvalho, 1959: 204 (see this catalog for complete listing of pre-1959 citations and misidentifications). – Kelton, 1980: 167, figs. 114, 116, map 49. – Henry and Stonedahl, 1983: 455.

TYPES: The original description lists the following locality data for *lasiomerus*: “Gold River, Long Lake, Huckleberry.” Reuter (1909) did not indicate the number of specimens in the type series, but it is clear from the description that he examined both sexes. Henry and Stonedahl (1983) record a specimen from each of the above localities (2 males, 1 female) in the Termesztudományi Museum, Budapest, Hungary. These specimens bear no additional label data to substantiate their place and date of collection. However, each of the place names provided

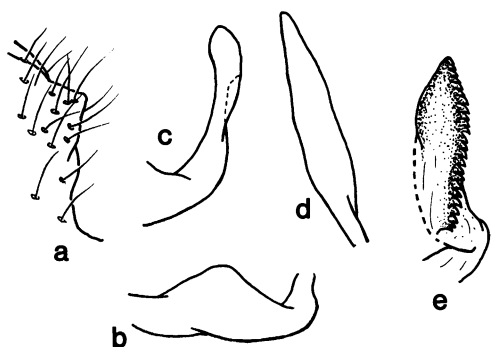
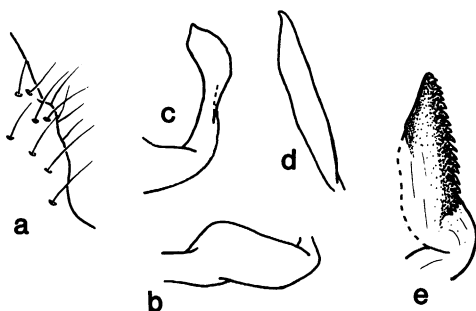
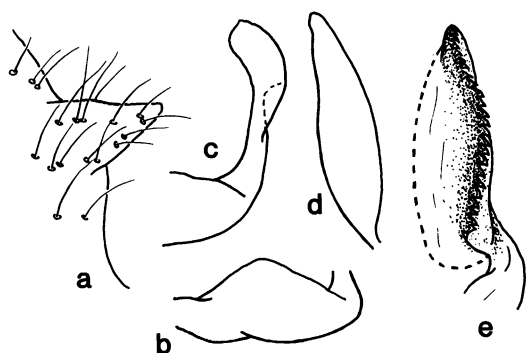
by Reuter describes a geographic locality in northern New York state. A male specimen from the “Long Lake” locality was designated a lectotype by Henry and Stonedahl (1983), and is deposited in the Budapest Museum.

DIAGNOSIS: Length 7.1–8.4. *Phytocoris lasiomerus* is easily distinguished from *pallidicornis* and *rubropictus* by the dark brown or black apical region on the second antennal segment. This species is further differentiated from *pallidicornis* by the distinct tubercle above the left paramere base (fig. 148a) and longer first antennal segment. The parameres, and heavy spines on the vesica are similar to those of *pallidicornis* and *rubropictus*.

DISCUSSION: *Phytocoris lasiomerus* has a transcontinental distribution in the northern United States and southern Canada (Carvalho, 1959; Kelton, 1980). In western North America this species is known from Colorado, Idaho, Montana, Oregon, Utah, Washington, Wyoming, Alberta, and British Columbia. Specimens have been collected as far south as Umatilla Co., Oregon; Utah Co., Utah; and Douglas Co., Colorado. The northernmost record in British Columbia is at Quesnel. Kelton (1980) reports this species as far north as Peace River in Alberta. I have examined 80 specimens with collection dates from June 18 to September 15. No host plant records were given with these specimens, but Knight (1923) and Kelton (1980) report this species from herbaceous plants. Blatchley



Figs. 146, 147. *Phytocoris lasiomerus*. 146. Lateral view of head and first antennal segment. 147. Sericeous setae of dorsal vestiture.

148 *lasiomerus*149 *pallidicornis*150 *rubropictus*

Figs. 148–150. Male genitalia of *lasiomerus* group species. **a.** Left dorsolateral margin of genital capsule. **b.** Arm of left clasper, lateral view. **c.** Shaft of left clasper, dorsal view. **d.** Right clasper, lateral view. **e.** Sclerotized process of vesica.

(1926) lists “willows and weeds” as the habitat of *lasiomerus* in New York.

Phytocoris pallidicornis Reuter

Figure 149

Phytocoris pallidicornis Reuter, 1876: 69. – Uhler, 1895: 33. – Reuter, 1909: 33, 34 (misspelled *pallicornis*). – Van Duzee, 1917a: 316. – Knight, 1923: 618, 619. – Blatchley, 1926: 703. – Knight, 1941: 185. – Carvalho, 1959: 209 (see this catalog for complete listing of pre-1959 citations). – Kelton, 1980: 169, fig. 117, map 50. – Henry and Stonedahl, 1983: 457.

TYPES: *Phytocoris pallidicornis* was described from a single female specimen collected in Wisconsin by Kumlien (see Reuter, 1876, 1909). This specimen was examined by Henry and Stonedahl (1983), and identified by them as the holotype of the species. It is deposited in the SMNH.

DIAGNOSIS: Length 6.5–7.4. *Phytocoris pallidicornis* is very similar to *lasiomerus* but differs by the unicolored second antennal segment, and the genital capsule without a distinct tubercle above the base of the left paramere (fig. 149a). The small size, red markings on the scutellum, and unmodified genital capsule distinguish this species from *rubropictus*.

DISCUSSION: The distribution of *pallidicornis* is similar to that of *lasiomerus*; transcontinental in the northern United States and southern Canada. I have examined several dozen specimens from British Columbia, Colorado, Idaho, Montana, Oregon, and Washington. Specimens have been collected as far south as Union Co., Oregon and Routt Co., Colorado. The northernmost record is from Soda Crk. in British Columbia. Collection dates are from July 23 to September 14. Knight (1923) and Kelton (1980) give “herbaceous plants” as the habitat of this species.

Phytocoris rubropictus Knight

Figure 150

Phytocoris rubropictus Knight, 1923: 619, 620. – Blatchley, 1926: 703, 704. – Carvalho, 1959: 215.

TYPES: This species was described from two specimens: female holotype, Wanakena, Lawrence Co., New York, 12 August 1920, C. J. Drake; male allotype, Roque Bluffs, Washington Co., Maine, 15 August 1907, J. A. Cushman. Both specimens are retained in the Knight Collection (USNM).

DIAGNOSIS: Length 7.4–8.2. This species closely resembles *lasiomerus* but differs by the more reddish general coloration, uniformly yellow second antennal segment and scutellum, and much larger tubercle above the base of the left paramere (fig. 150a). The larger body size, uniformly pale scutellum, and large genital tubercle distinguish this species from *pallidicornis*.

DISCUSSION: *Phytocoris rubropictus* is known only from Maine and New York. One additional specimen was examined from Paul Smiths, Franklin Co., New York. The habitat of *rubropictus* is not known, but like other members of the *lasiomerus* group, it probably occurs on herbaceous plants. Collection dates are from July 29 to August 15.

LISTI SPECIES-GROUP

DIAGNOSIS: Recognized by the small size; short first antennal segment; lorum and jugum equally swollen (fig. 152); dorsum with erect, black, bristlelike setae; and genital structures of the males: right primary membranous lobe of vesica large and highly folded, partly sclerotized or set with spinulae; left primary lobe of vesica with horn- or platelike lobal sclerite distally; sclerotized process with strongly serrate outer margin. All known females of this group are strongly brachypterous.

DESCRIPTION: Small to moderate size, 3.2–6.5, brown or reddish brown species with sparsely distributed, black, bristlelike setae predominantly along veins of hemelytra, and more evenly distributed, silvery white, sericeous setae. **Head:** antennae brownish yellow to dark brown; segment I pale, usually with red to fuscous markings dorsally, length of segment I less than width of head across eyes; frons moderately and evenly convex, meeting tylus along shallow depression; frons with 6–8 dark striae laterally; tylus moderately produced at base; jugum and lorum equally swollen, elongate; eyes obovate to slightly reniform, occupying from slightly more than half to two-thirds of head height; rostrum reaching apices of hind coxae or beyond, sometimes to base of genital capsule. **Pronotum:** disk pale with reddish brown or fuscous markings; calli swollen, often rising abruptly from collar; propleura dark reddish brown or fuscous, apical fourth to one-third pale. **Hemelytra:** grayish white or pale grayish yellow; clavus and corium moderately to densely checked or spotted with brown to fuscous, except uniformly brownish red for *decorus*; cuneus fuscous, basal third to one-half and extreme apex mostly pale, except cuneus bright red for *decorus*; membrane smoky,

sometimes with faint darker maculae. **Legs:** femora pale, moderately to extensively darkened with red to fuscous, dark regions often broken by pale spots; hind femora sometimes with pale preapical band; tibiae pale yellow or reddish yellow, sometimes with four or five dark annuli. **Male genitalia:** genital capsule, except *hispidus*, with prominent tubercle above base of left paramere. **Left paramere:** sensory lobe moderately to strongly produced; shaft narrow, slightly expanded distally in dorsal view, except broad and strongly dorsoventrally flattened for *albicuneatus* and *decorus*; apex acute or truncate. **Right paramere:** elongate; dorsal margin somewhat arcuate; narrow region before apex of shaft weakly sclerotized, often appearing membranous; apex acute. **Vesica:** primary membranous sac multilobed, extreme right lobe highly folded, sclerotized in part and usually set with tiny spinulae; left margin of primary sac usually with horn- or platelike lobal sclerite distally; basal lobes well developed; basal process lightly to heavily sclerotized, extending to level of gonopore or slightly beyond; sclerotized process with medial groove, and reflexed margins, outer margin with 9–15 strong serrations.

DISCUSSION: The *listi* group comprises five species distributed predominantly in Arizona, Colorado, New Mexico, and western Texas. A few specimens of *decorus* and *listi* have been collected in southwestern Kansas. The latter species is reported as far north as Fall River Co., South Dakota (Knight, 1928) and southern Saskatchewan, Canada (Kelton, 1980). The host plant associations of these species are entirely unknown.

The males of *listi* group species are attracted to light, suggesting that they are at least partially nocturnal in their habits. The fe-

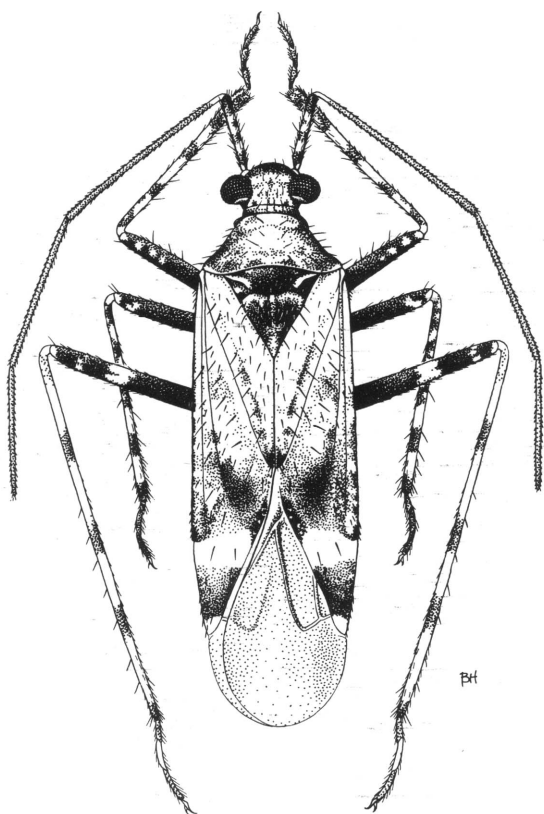


Fig. 151. *Phytocoris albicuneatus*, dorsal habitus of male.

males of *decorus* and *listi* are strongly brachypterous, which explains why they are not taken at light with the males. The females of other *listi* group species are not known. Sweeping vegetation at night in areas where males are coming to light should produce female specimens and provide a means for determining the host plant associations of these species.

KEY TO SPECIES OF THE *LISTI* GROUP

- 1 Pronotum, at least on posterior lobe, mesoscutum, and scutellum, with continuous pale line medially 2
- Pronotum, mesoscutum, and scutellum without pale median line 3
- 2(1) Collar and propleura mostly fuscous; front tibiae with five well-defined dark annuli; genital capsule of male without distinct tu-

bercle above base of left paramere (fig. 156a); length 4.75–5.05 ... *hispidus* n. sp.

Collar and propleura mostly pale, with limited brownish markings; front tibiae with two or three faint annuli; genital capsule of male with elongate tubercle above base of left paramere (fig. 158a); length 5.45–5.50 *schaffneri* n. sp.

- 3(1) Hemelytra dark reddish brown, cuneus bright red; legs uniformly yellowish red; length of antennal segment II of male equal to or slightly greater than posterior width of pronotum *decorus* (Reuter)

Hemelytra grayish or brownish yellow with brown to fuscous markings, cuneus pale basally, distal half mostly fuscous; length of antennal segment II of male much greater than posterior width of pronotum ... 4

- 4(3) Ratio of length of antennal segment I to width of head across eyes from 0.75:1 to 0.85:1 for males; left genital tubercle flattened laterally, apex angulate (fig. 154a)

..... *albicuneatus* n. sp.

Ratio of length of antennal segment I to width of head across eyes from 0.65:1 to 0.75:1 for males; left genital tubercle not noticeably flattened, apex broadly rounded (fig. 157a) *listi* Knight

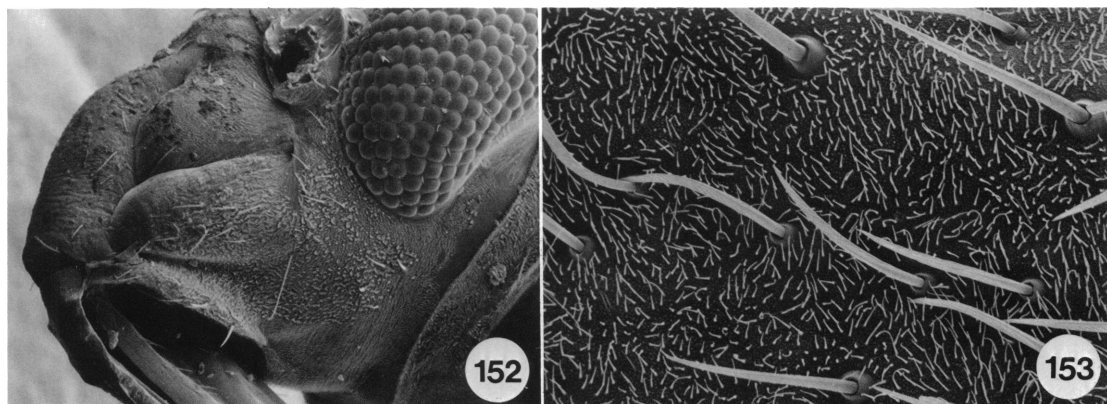
Phytocoris albicuneatus, new species

Figures 151, 154

HOLOTYPE MALE: 17 mi E of Douglas, Cochise Co., Arizona, 12 August 1975, taken at black light, J. D. Pinto and S. I. Frommer (UCR; donated to the AMNH).

PARATYPES: ARIZONA. **Cochise Co.:** 11 males, same data as holotype (OSU, UCR); 1 male, Douglas, 8 July 1956, J. H. Russell (USNM); 1 male, Douglas, 15 August 1958, W. R. Bowen (UCR); 1 male, Portal, 1 August 1967, taken at black light, S. S. Frommer (UCR). NEW MEXICO. **Hidalgo Co.:** 2 males, Cienega Lk., N of Rodeo, 29 July 1967, V. D. Roth (AMNH). TEXAS. **Culberson Co.:** 2 males, 10 mi N Van Horn, 27 August 1971, E. E. Grissell and R. F. Denno (CSU).

DIAGNOSIS: *Phytocoris albicuneatus* is distinguished from other species of the *listi* group by the following combination of characters: general coloration grayish brown with dark brown markings; pronotum and scutellum without pale, median line as in *hispidus* and *schaffneri*; ratio of length of antennal segment I to width of head across eyes from 0.75:1 to



Figs. 152, 153. *Phytocoris decorus*. 152. Ventrolateral view of head. 153. Sericeous setae of dorsal vestiture.

0.85:1 for males; length of antennal segment II of male much greater than posterior width of pronotum; left genital tubercle laterally flattened, apex angulate (fig. 154a); and shaft of the left paramere broad, strongly flattened (fig. 154c).

DESCRIPTION: *Male*. Length 5.56–6.21, width 1.57–1.69; dark grayish brown general coloration, ventral regions reddish brown to nearly fuscous. **Head:** width across eyes 0.91–0.96, vertex 0.31–0.35, ventral region shiny reddish brown; vertex, frons, basal half of tylus, and apices of jugum and lorum pale yellow with limited red to fuscous markings; frons moderately convex, meeting tylus along shallow depression, with 6–8 dark striae either side of middle. **Rostrum:** length 2.45–2.66, reaching between sixth and eighth abdominal segments. **Antennae:** I, length 0.68–0.72, white or pale yellow with reddish brown to fuscous annulus at base and apex, pale medial region lightly mottled with reddish brown on dorsal aspect; II, length 1.80–2.03, yellowish brown; III, length 1.24–1.35, yellowish brown; IV, length 1.03–1.26, yellowish brown. **Pronotum:** mesal length 0.77–0.83, posterior width 1.31–1.42; disk grayish yellow, lightly to moderately tinged or mottled with brown to fuscous; calli swollen, rising abruptly from collar, lightly mottled with reddish brown to fuscous; propleura dark reddish brown or fuscous, shiny, sometimes narrowly pale at apex. **Scutellum:** pale yellow, moderately to extensively mottled with fuscous, almost entirely

darkened in some specimens but basal angles and apex remaining pale. **Hemelytra:** grayish yellow, variously tinged and mottled with brown to fuscous; corium with large fuscous fascia posteromedially; basal third to one-half and apex of cuneus white or pale yellow, remaining portion fuscous; membrane uniformly infuscated. **Legs:** femora dark reddish brown or fuscous, sparsely marked with pale spots mostly on apical half; front and middle femora narrowly pale basally; preapical band and basal third of hind femora pale; tibiae pale with reddish brown to fuscous markings; front tibiae with five dark annuli including narrow band at base and apex; middle and hind tibiae also with dark bands but sometimes less distinct. **Vestiture:** dorsum with short, suberect, simple setae, silvery white, sericeous setae, and sparsely distributed, long, erect; black, bristlelike setae, the latter mostly along veins of clavus and corium. **Genitalia:** Figure 154.

Female. Unknown.

ETYMOLOGY: From the Latin, *albus* (white) and *cuneatus* (wedge-shaped), referring to the white basal region of the cuneus.

DISCUSSION: This species is known only from the type material collected in Cochise Co., Arizona, Hidalgo Co., New Mexico, and Culberson Co., Texas. Most of these specimens were taken at black light. The absence of females at light suggests that they are brachypterous, as are the females of *decorus* and *listi*. The host plant association of *albicunea-*

tus is not known. Collection dates are from July 29 to August 27.

Phytocoris decorus (Reuter),
new combination

Figures 152, 153, 155

Ecertobia decora Reuter, 1909: 36. – Van Duzee, 1917a: 320. – Carvalho, 1952: 88; 1955: 87; 1959: 87.

TYPES: According to the original description, Reuter described this species from a single male specimen (Fort Collins, Col., 10 June 1898) sent to him by E. P. Van Duzee. At the time, Reuter was under the impression that P. R. Uhler was providing descriptions for this new genus and species, and so attributed his description of “*decora*” to Uhler. Since Uhler’s treatment of this taxon was never published, Reuter (1909) is credited for the description of the genus and species. The holotype is deposited in the ZMH and is identified by a red rectangular label with data: “HOLOTYPE: *Ecertobia decora* Reuter, det. by Stonedahl, 1985.”

DIAGNOSIS: Length: male 5.65–6.05, female 3.75–4.05. Distinguished from other members of the *listi* group by the reddish brown general coloration, pronotum and scutellum without pale median line, length of antennal segment II of male equal to or slightly greater than posterior width of pronotum, and by the structure of the male genitalia, especially the broad, flattened shaft of the left paramere (fig. 155c). The females of this species are strongly brachypterous.

DISCUSSION: I have examined 18 specimens of *decorus* from the following localities: ARIZONA. Apache Co.: Vernon (UAZ). COLORADO. Larimer Co.: Fort Collins (USNM). Prowers Co.: Lamar (USNM). KANSAS. Hamilton Co.: Unspecified locality, 1022 m (USNM). Collection dates are from June 10 to June 26. Nine of the 11 specimens collected at Fort Collins, Colorado, have label data identical to that of the holotype, but apparently were not examined by Reuter when he described the species. The host plant association of *decorus* is not known. Several male specimens have been collected at UV light.

The male genitalic structures of *decorus* are similar to those of *albicuneatus*, but differ by

the smaller and more narrowly produced genital tubercle (fig. 155a), shaft of left paramere less broadly flattened (fig. 155c), and sclerotized process of vesica slightly smaller and with narrower serrations (fig. 155e).

Phytocoris hispidus, new species

Figure 156

HOLOTYPE MALE: Badger, Santa Cruz Co., Arizona, 31 July 1924, E. O. Martin (CAS).

PARATYPES: ARIZONA. Pima Co.: 1 male, 30 mi E Quijotoa, 28–29 August 1927 (OSU); Santa Cruz Co.: 1 male, same data as holotype (OSU).

DIAGNOSIS: *Phytocoris hispidus* is easily recognized by the pale median line on the pronotum and scutellum, and males without a tubercle on the genital capsule near the left paramere base (fig. 156a). Characters that further differentiate this species from *schaffneri* are the mostly fuscous collar and propleura, front tibiae with five well defined dark annuli, and ratio of length of antennal segment III to length of segment II approximately 0.75:1 (ratio for *schaffneri* 0.60:1).

DESCRIPTION: *Male.* Length 4.75–5.05, width 1.51–1.56; dark brown general coloration. **Head:** width across eyes 0.86–0.90, vertex 0.32–0.34; pale yellow; buccula, jugum, lorum, apex of tylus, and postocular region marked with dark shiny reddish brown or fuscous; vertex and frons lightly tinged with brown; frons moderately convex, meeting tylus along shallow depression with 6–8 narrow striae either side of middle. **Rostrum:** length 2.28–2.39, reaching apices of hind coxae or slightly beyond. **Antennae:** I, length 0.75–0.81, dark reddish brown with pale markings; II, length 2.20–2.31, brownish yellow; III, length 1.64–1.76, brownish yellow; IV, length 1.04–1.07, brownish yellow. **Pronotum:** mesal length 0.75–0.78, posterior width 1.30–1.34; disk pale yellow, mottled with brown behind calli and with distinct pale line medially; collar fuscous, with broad pale region medially; calli swollen, rising abruptly from collar, marked with fuscous anteriorly; propleura fuscous, apical third and line crossing coxal cleft pale. **Scutellum:** pale yellow, mottled with brown or dark reddish brown but leaving median line pale, basal angles and apex broadly pale. **Hemelytra:** grayish white

or pale grayish yellow, extensively darkened with brown or dark brown; cuneus pale, invaded by reddish brown, apical half mostly fuscous, apex narrowly pale; membrane uniformly infuscated or nearly so. **Legs:** femora pale yellow, extensively darkened with deep reddish brown or fuscous, dark regions broken by pale spots; tibiae pale with five fuscous annuli, dark bands sometimes broken by pale spots. **Vestiture:** dorsum with short, suberect, simple setae, silvery white, sericeous setae and sparsely distributed, erect, black, bristle-like setae. **Genitalia:** Figure 156.

Female. Unknown.

ETYMOLOGY: From the Latin, *hispidus*, to describe the bristly setae on the dorsum of this species.

DISCUSSION: *Phytocoris hispidus* is known only from the type material collected in Pima and Santa Cruz counties, Arizona. The host plant association is not known.

Phytocoris listi Knight

Figure 157

Phytocoris listi Knight, 1928: 30, 31. – Carvalho, 1959: 204. – Kelton, 1980: 172, fig. 120, map 51.

TYPES: Described from eight male specimens collected at Fort Collins, Larimer Co., Colorado and Ardmore, Fall River Co., South Dakota. The holotype was taken at Fort Collins, 17 June 1920, G. M. List. The holotype and two paratypes are deposited in the Knight collection (USNM); five paratypes were not located.

DIAGNOSIS: Length: male 5.0–6.0, female 3.2. *Phytocoris listi* is very similar to *albicuneatus* but is distinguished by the shorter first antennal segment and structure of the male genitalia. The ratio of length of antennal segment I to width of head across eyes ranges from 0.65:1 to 0.75:1 for males. The left genital tubercle is thicker and more broadly rounded than for *albicuneatus* (fig. 157a). The shaft of the left paramere is narrow and slightly expanded distally (fig. 157c); not broad and strongly flattened as in *albicuneatus*.

DISCUSSION: Several dozen specimens of *listi* were examined from the following localities: ARIZONA. Apache Co.: Ganado (UAZ). Cochise Co.: Texas Cyn., Chiricahua Mts., 1740 m (USNM). Santa Cruz Co.: Pat-

agonia (USNM); Santa Rita Mts., T17S, R14E (UAZ). COLORADO. Larimer Co.: Fort Collins (USU). Las Animas Co.: Unspecified locality (USNM). Otero Co.: La Junta (JTP). KANSAS. Meade Co.: Unspecified locality, 1143 m (KU). NEW MEXICO. Eddy Co.: Unspecified locality (TA&M). Sandoval Co.: Jemez Springs (KU). TEXAS. Brewster Co.: 9 mi W Alpine (TA&M). Jeff Davis Co.: Davis Mts. (UCD, USNM); Sawtooth Mt. Pk. (TA&M). Collection dates are from June 9 to September 23. Kelton (1980) records this species from southern Saskatchewan, Canada. I have seen only two females of *listi*; both are strongly brachypterous. The host plant association is not known.

Phytocoris schaffneri, new species

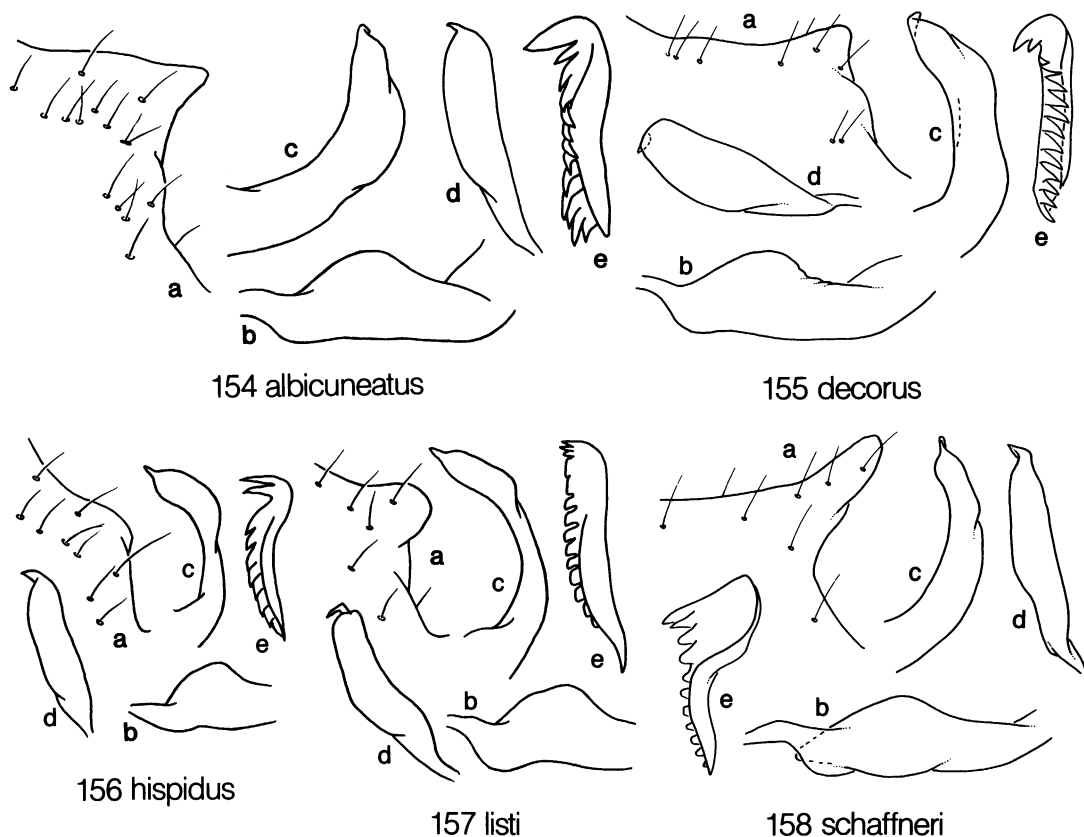
Figure 158

HOLOTYPE MALE: 9 mi W of Alpine, 30°16'N, 103°47'W, Brewster Co., Texas, 17 August 1965, taken at light, J. C. Schaffner (TA&M; donated to the AMNH).

PARATYPES: 1 male, same data as holotype (TA&M).

DIAGNOSIS: Recognized by the pale brown general coloration; posterior lobe of pronotal disk, mesoscutum, and scutellum with continuous pale line medially; front tibiae with two or three poorly defined dark bands; and genital capsule of male with large, cylindrical tubercle above base of left paramere (fig. 158a).

DESCRIPTION: *Male.* Length 5.45–5.50, width 1.60–1.66; yellowish brown general coloration with limited darker brown markings. **Head:** width across eyes 1.00–1.01, vertex 0.40–0.42; creamy white with reddish brown to fuscous markings on vertex, lower margin of jugum, lorum, narrow border around antennal fossa, and region behind eyes; frons moderately convex, marked with several faint striae; lower margin of antennal fossa even with or slightly above ventral margin of eye; eye occupying slightly more than half of head height. **Rostrum:** length 3.15–3.30, reaching base of ninth abdominal segment. **Antennae:** brownish yellow, segment I with limited brown markings dorsally; I, length 0.65–0.73, with several stout setae distally; II, length 2.08–2.25; III, length 1.24–1.37; IV, length 0.95–1.12. **Pronotum:** mesal



Figs. 154–158. Male genitalia of *listi* group species. **a.** Left dorsolateral margin of genital capsule. **b.** Arm of left clasper, lateral view. **c.** Shaft of left clasper, dorsal view. **d.** Right clasper, lateral view. **e.** Sclerotized process of vesica.

length 0.88–0.91, posterior width 1.43–1.50; brownish yellow with limited brown or reddish brown markings, median longitudinal line pale; propleura mostly pale, lightly tinged with brown. **Scutellum:** weakly convex; pale yellow with limited fuscous markings dorsally and lateromedially, and with pale median line continuous across mesoscutum onto posterior lobe of pronotal disk; mesoscutum broadly darkened bordering median line. **Hemelytra:** grayish yellow with limited brownish or fuscous markings; inner half of clavus and posteromedial region of corium more broadly tinged with brown; posteromedial angle of corium and inner margin of cuneus narrowly fuscous; membrane with densely scattered faint maculae, veins mostly pale.

Legs: femora pale yellow, usually more brownish yellow distally, lightly to moderately marked with red or reddish brown mostly on distal half; tibiae pale, front pair with two or three faint bands, hind pair marked with red basally; tarsi yellowish brown. **Vestiture:** dorsum with stout, erect, black, simple setae and recumbent, silvery white, sericeous setae. **Genitalia:** Figure 158.

Female. Unknown.

ETYMOLOGY: Named for Joe C. Schaffner, Professor of Entomology, Texas A&M University, College Station.

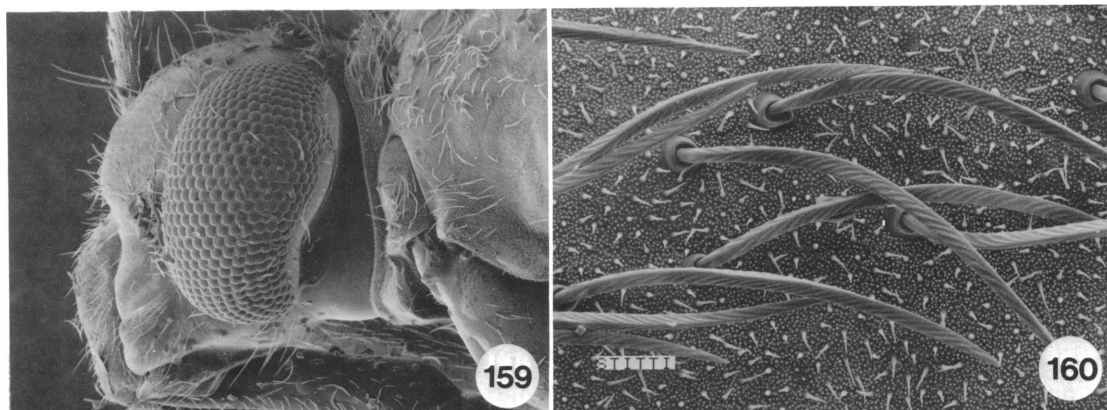
DISCUSSION: Known only from the type and paratype collected at light in Brewster County, Texas. The host plant association is not known.

PLENUS SPECIES-GROUP

DIAGNOSIS: Recognized by the brown or brownish yellow general coloration; subquadrate head, with moderate to large eyes (fig. 159); dorsum without scalelike setae (fig. 160); pronotal disk without tumid points on posterior submargin; and the following characters of the male genitalia: genital capsule usually with well-developed tubercle above paramere bases; vesica with large, multilobed primary membranous sac, and one or rarely two sclerotized processes, usually with three or more coarse serrations (fig. 2); sclerotized processes of vesica broadly attached to primary membranous sac.

DESCRIPTION: Moderate to large, 4.7–9.1, brown, brownish yellow, or sometimes pale green species; vestiture of dorsum with pale to dark brown, simple setae and silvery white to golden, sericeous setae. **Head:** subquadrate; height usually slightly greater than length in lateral view; frons moderately to strongly convex, noticeably produced antieriad of antennae fossae, or rarely less prominent and only scarcely protruding beyond fossae; junction of frons and tylus shallowly to deeply depressed; eyes occupying from slightly less than two-thirds to nearly entire height of head in lateral view; antennae brownish yellow to fuscous, segments III and IV usually darker than segment II; segment II sometimes with pale, median annulus. **Pronotum:** disk uniformly pale to extensively darkened, posterior submargin sometimes with transverse fuscous line or series of dark patches; propleura uniformly pale or variously darkened, sometimes divided by one or two dark lines. **Hemelytra:** grayish white, pale brownish yellow, or sometimes pale green; usually with limited to extensive mottled pattern of reddish brown, brown, or fuscous; rarely lightly to heavily tinged with red, especially on cuneus and distal third of corium; darker species usually with distinct pale region at apex of corium and base of cuneus; membrane lightly to densely mottled with fuscous. **Legs:** femora white or pale yellow, with red, brown, reddish brown, or fuscous markings or reticulations; hind femora sometimes extensively darkened and marked with pale spots, sometimes with pale, preapical band; tibiae

pale, usually with 3–5 dark annuli. **Male genitalia:** genital capsule, except *bakeri*, *microfascinum*, *tehachapi*, *tenerum*, with prominent tubercle above base of left paramere. **Left paramere:** sensory lobe moderately to strongly produced; ventrodistal margin of arm sometimes strongly produced; shaft slightly to moderately expanded distally in dorsal view; apex truncate. **Right paramere:** elongate to broadly lanceolate; dorsal margin in lateral view usually slightly concave medially; basal region sometimes with knoblike protuberance on dorsal or inner-dorsal surface; distal half variable, gradually tapered or sometimes nearly parallel-sided and abruptly tapered apically; apex acute. **Vesica:** primary membranous sac multilobed, lobes large, sometimes with patches of small tubercles or spines, or rarely with small lobal sclerite apically; *hirsuticus*, *ingens*, and *sanjoaquin* with larger, broadly attached lobal sclerite originating from distomedial surface of primary sac just left of sclerotized process; sclerotized process of three types: (1) bulbous and broadly opened basally; flattened and tapered distally, sometimes gently curved, or rarely with strongly recurved, expanded apical region; nonserrate; narrowly attached basally to membranous sac; (2) slightly flattened, elongate sclerite with 3–15 marginal serrations, usually restricted to distal third to one-half of process; sometimes strongly twisted distally; basal half or slightly more attached to membranous sac; (3) small, somewhat ovate process with deep medial groove, and 6–10 serrations along one margin; attached for nearly entire length to primary membranous sac (see generic discussion for further discussion of sclerotized process); basal lobes well developed; right basal lobe usually larger than left, sometimes extending well ventrad of gonopore and with partly sclerotized outer surface; left basal lobe sometimes obsolete; basal process usually heavily sclerotized, extending to level of gonopore or beyond, joined to base of sclerotized process by narrow membranous region, or rarely broadly continuous with base of sclerotized process. Note: In *bakeri*, *formosus*, and *microfascinum*, the primary membranous sac of the vesica is



Figs. 159, 160. *Plenus* group species. 159. *plenus*, lateral view of head. 160. *stitti*, sericeous setae of dorsal vestiture.

greatly reduced or obsolete, the sclerotized process is very small or absent, and the basal process is indistinct.

DISCUSSION: The *plenus* group comprises 24 species distributed predominantly in the American Desert and California Chaparral provinces of the southwestern United States. Several members of this group also occur in the Intermountain Sagebrush Province, and two species are known only from southeastern Arizona.

The host plant relationships of many *plenus* species are poorly known. However, the available records indicate that members of this group occur primarily on herbaceous plants and small, highly branched shrubs. Some species (e.g., *plenus*, *stitti*, *tenerum*) have been collected on a variety of plants and do not appear to have a specific breeding host. In particular, the species inhabiting herbaceous plants exhibit little or no host plant specificity.

Many *plenus* group species are attracted to light, which suggests that they are active and may forage at night. Several species also have been collected in pitfall traps, which supports the idea that some *Phytocoris* species inhabiting arid regions seek shelter in ground litter during hot daylight hours.

The *plenus* group is the most morphologically diverse assemblage of species recognized in the present study. Although the head structure, dorsal vestiture, and color patterns of these species are similar, the male genitalia

show a wide range of variation, which complicates group recognition. Based primarily on the structure of the vesica, four distinct subgroups can be recognized:

Subgroup 1 (*bakeri*, *formosus*, *microfascinum*)—primary membranous sac of vesica greatly reduced or obsolete; sclerotized process small or absent; basal process weakly developed.

Subgroup 2 (*aridus*, *desertinus*, *longihirtus*, *megatuberis*, *quadriannulipes*, *reticulatus*, *te-hachapi*)—primary membranous sac of vesica slightly reduced; right basal lobe very large, with partly sclerotized outer surface; left basal lobe small or obsolete; sclerotized process as described in group description under type 1.

Subgroup 3 (*conspicuus*, *hirsuticus*, *hirtus*, *ingens*, *plenus*, *roseus*, *sanjoaquin*, *seminotatus*, *sierrae*, *stitti*)—primary membranous sac of vesica normally developed, not appearing reduced; basal lobes equally developed or with right lobe slightly larger; sclerotized process as described in group description under type 2.

Subgroup 4 (*breviatus*, *electilis*, *solano*, *tenerum*)—membranous portions of vesica as described for subgroup 3; sclerotized process as described in group description under type 3.

Based on the structure of the male genitalia, especially the form of the sclerotized process and its attachment to the primary membranous sac of the vesica, the four

subgroups of the *plenus* group are individually supported as monophyletic. However, no synapomorphies were found that applied to all members of the *plenus* group collectively. The broadly attached, serrate, sclerotized process is the only diagnostic character of the *plenus* group that is synapomorphic, and indicates a sister-group relationship for subgroups 3 and 4 only. All other external and genitalic characters given in the group diagnosis appear to be plesiomorphic based on outgroup comparison with other mirine genera (Stonedahl, 1983b; Schwartz, 1987). In other words, there is no character information to support the *plenus* group as a monophyletic assemblage, specifically that subgroups 1 and 2 are the nearest relatives of the sister-groups 3 and 4. A similar conclusion was reached by Stonedahl (1983b), where I divided the *plenus* group into five subgroups and included them in a cladistic analysis with the other species-groups of western North American *Phytocoris*.

Although the analysis of species-groups conducted by Stonedahl (1983b) is tentative (see earlier explanation), it did indicate a lack of defining characters for the *plenus* group as a whole. Based on the available character information, the only reasonable solution is to recognize three distinct species-groups (subgroup 1, subgroup 2, subgroups 3 + 4). This has not been implemented in the present study because many additional, undescribed species belonging to the "*plenus* complex" are distributed in Mexico. Consideration of this poorly studied material may substantially alter the classification presented here, or perhaps, result in the discovery of characters to support larger monophyletic groupings. At present, the *plenus* group is one of convenience with its included species recognized by the characters given in the group diagnosis. These species can be placed into their respective monophyletic subgroups by the genitalic characters described earlier.

KEY TO SPECIES OF THE *PLENUS* GROUP

Since positive identification of some *plenus* group species requires examination of male genital structures, portions of the following

key are based exclusively on characters of the male genitalia.

- 1 Ratio of length of antennal segment I to width of head across eyes less than or equal to 1.10:1 for males and 1.20:1 for females 2
- Ratio of length of antennal segment I to width of head across eyes greater than 1.10:1 for males and 1.20:1 for females 6
- 2(1) Antennal segment II sparsely set with long, erect setae *longihirtus* Knight
- Antennal segment II without long, erect setae 3
- 3(2) Antennal segment I with middle third uniformly pale 4
- Antennal segment I with pale markings, but middle third never uniformly pale 5
- 4(3) Hemelytra pale green; inner apical angle of corium with large fuscous spot *electilis* n. sp.
- Hemelytra pale grayish yellow with brown or reddish brown markings; corium without fuscous spot apically *conspicuus* Johnston
- 5(3) Paracuneus marked with fuscous spot; scutellum strongly convex; genital capsule of male without tubercle above base of left paramere (fig. 184a) *tenerum* n. sp.
- Paracuneus without fuscous spot; scutellum weakly to moderately convex; genital capsule of male with blunt tubercle above base of left paramere (fig. 163a) *breviatus* Knight
- 6(1) Front tibiae with 3–5 dark annuli 7
- Front tibiae unicolored, without dark annuli 22
- 7(6) Apices of front tibiae pale 8
- Apices of front tibiae darkened 10
- 8(7) Antennal segment I pale with three dark bands dorsally; tubercle above base of left paramere narrowly produced, elongate (fig. 165a) *desertinus* n. sp.
- Antennal segment I with fuscous markings, but lacking dark bands; left genital tubercle broadly produced (figs. 161a, 176a) 9
- 9(8) Pronotal disk with fuscous spot behind each callus; shaft of left paramere abruptly expanded distally (fig. 176c) *reticulatus* Knight
- Pronotal disk without fuscous spots behind calli; shaft of left paramere only slightly and gradually expanded distally (fig. 161c) *aridus* n. sp.

- 10(7) Primary membranous sac of vesica greatly reduced or obsolete (fig. 173e); sclerotized process absent or very small and club-shaped 11
 Primary membranous sac of vesica well developed; sclerotized process present, variable in size and shape but never small or club-shaped 13
- 11(10) Genital capsule with small knoblike tubercle above base of left paramere (fig. 167a); vesica with small club-shaped sclerotized process (fig. 167e)
 *formosus* Van D.
 Genital capsule without tubercle above left paramere base; vesica without sclerotized process 12
- 12(11) Basal fourth of antennal segment I nearly twice as thick as segment II; length 4.8–5.2 *bakeri* Reuter
 Basal fourth of antennal segment I only slightly thicker than segment II; length 5.3–6.7 *microfascinum* n. sp.
- 13(10) Vesica with prominent lobal sclerite originating from distomedial surface of primary membranous sac (fig. 2)
 *ingens* Van D.
 Vesica without lobal sclerites 14
- 14(13) Sclerotized process with three or more strong serrations 15
 Sclerotized process without serrations 20
- 15(14) Hemelytra tinged or marked with red, sometimes almost entirely reddened
 *roseus* (Uhler)
 Hemelytra without red markings 16
- 16(15) Sclerotized process with three or four strong serrations distally (figs. 174e, 180e, f) 17
 Sclerotized process with eight or more serrations (figs. 169e, 181e, 182e) 18
- 17(16) Sclerotized process large, length equal to or greater than length of right paramere, apical serrations broad (fig. 174e); expanded distal region of shaft of left paramere with distinct notch proximally (fig. 174c); left genital tubercle as in figure 174a *plenus* Van D.
 Sclerotized process much shorter than right paramere (fig. 180e), or if similar in length then apical serrations narrow (fig. 180f); expanded region of shaft of left paramere unnotched proximally (fig. 180c); left genital tubercle as in figure 180a *sierrae* n. sp.
- 18(16) Antennal segment II with broad, pale annulus medially; left genital tubercle broad and slightly flattened laterally (fig. 181a); length 6.6–6.8 *solano* n. sp.
 Antennal segment II sometimes lighter medially, but without distinct pale annulus; left genital tubercle narrow and cylindrical (figs. 169a, 182a); length 6.5–9.2 19
- 19(18) Legs clothed with erect pale setae, length of setae two to three times thickness of hind tibia *hirtus* Van D.
 Legs clothed with short pale setae, length of setae rarely exceeding thickness of hind tibia *stitti* Knight
- 20(14) Genital capsule with large tubercle above base of left paramere (figs. 172a, 175a); sclerotized process of vesica narrowly bulbous basally, gradually tapered distally (figs. 172e, 175e) 21
 Genital capsule swollen above base of left paramere, but without distinct tubercle (fig. 183a); sclerotized process broadly bulbous basally, strongly constricted medially with distal portion of uniform thickness (fig. 183e) .. *tehachapi* n. sp.
- 21(20) Ratio of length of antennal segment I to posterior width of pronotum from 0.85:1 to 1.00:1 for males and 1.11:1 to 1.23:1 for females; left genital tubercle as in figure 172 *megatuberis* n. sp.
 Ratio of length of antennal segment I to posterior width of pronotum from 0.75:1 to 0.85:1 for males and 1.02:1 to 1.08:1 for females; left genital tubercle as in figure 175a ... *quadriannulipes* Knight
- 22(6) Calli and lateral margins of collar with pinkish tinge and red markings; distal fourth to one-half of femora extensively marked with red or brownish red
 *sanjoaquin* n. sp.
 Calli, collar, and femora lacking red markings 23
- 23(22) Legs and antennal segment I densely set with long, pale setae; vestiture of hemelytra pale, sometimes with limited golden brown, simple setae; dorsal width of eye of male distinctly less than width of vertex 24
 Legs and antennal segment I without or with only a few long, pale setae; hemelytra with sparsely distributed, dark brown or black, simple setae; dorsal width of eye of male equal to or greater than width of vertex 25
- 24(23) Hemelytra pale green with faint dusky flecks; vesica with sclerotized process and large lobal sclerite (fig. 168e, f)
 *hirsuticus* Knight
 Hemelytra pale yellow, clavus and corium lightly tinged with brown; vesica with sclerotized process only (fig. 179e) ...
 *seminotatus* Knight
- 25(23) Antennal segment I sparsely set with long,

pale setae; dorsal width of eye of male greater than width of vertex; vesica with sclerotized process and elongate lobal sclerite (fig. 170e, f) ... *ingens* Van D.
 Antennal segment I without long, pale setae; dorsal width of eye of male about equal to width of vertex; vesica with sclerotized process only (fig. 182e) ...
 *stitti* Knight

***Phytocoris aridus*, new species**

Figure 161

HOLOTYPE MALE: Salt R. Cyn., Apache Lk., Maricopa Co., Arizona, 28 April 1981, D. A. and J. T. Polhemus (USNM).

PARATYPES: ARIZONA. **Maricopa Co.:** 1 male, same data as holotype (JTP); 6 males, Fish Crk., Tonto Nat. For., 9 and 10 May 1918, J. Ch. Bradley (CU). CALIFORNIA. **Riverside Co.:** 1 male, Andreas Cyn., 24 April 1954, taken at light, Timberlake (UCR); 1 male, Cottonwood Spg., 26 April 1949, taken at light, J. E. Gillaspay (UCB); 1 male, Deep Cyn., 16 May 1963, taken at light, E. I. Schlinger (UCR); 1 male, P. L. Boyd Desert Research Center, 3.5 mi S Palm Desert, 3 May 1974, D. L. Dickson (UCR). NEVADA. **Clark Co.:** 1 female, Boulder Beach, Lake Mead, 27 May 1965, J. Powell (UCB).

DIAGNOSIS: Distinguished from other members of the *plenus* group by the following combination of characters: antennal segment I without dark bands, length of segment greater than width of head across eyes; front tibiae with three dark annuli, apices pale; pronotal disk without fuscous spots behind calli; left genital tubercle of male broadly produced (fig. 161a); sensory lobe of left paramere prominent (fig. 161b), shaft only slightly expanded distally (fig. 161c); sclerotized process of vesica without serrations (fig. 161e).

DESCRIPTION: *Male.* Length 7.78–8.21, width 2.59–2.70; pale yellow ground color with brown to fuscous markings. **Head:** width across eyes 1.18–1.24, vertex 0.35–0.39; jugum, lorum, and tylus marked with reddish brown; frons moderately convex, with 6–8 dark striae laterally. **Rostrum:** length 3.11–3.31, reaching between fourth and sixth abdominal segments. **Antennae:** I, length 1.76–1.85, pale yellow with scattered brown markings; II, length 3.51–3.67, brownish yellow, apical third sometimes darker brown; III, length 1.80–1.89, brown to fuscous; IV, length

0.99–1.28, brown to fuscous. **Pronotum:** mesal length 1.13–1.22, posterior width 1.98–2.07; pale yellow with reddish brown to dark brown markings, particularly around calli and along lateral margins; propleura pale, anterior margin sometimes lightly infuscated medially. **Scutellum:** moderately convex; pale yellow with faint brown markings. **Hemelytra:** white or pale yellow, mottled with reddish brown to fuscous patches; membrane conspurcate. **Legs:** femora white or pale yellow with reddish brown to fuscous markings mostly on apical half; tibiae pale with three dark annuli. **Vestiture:** dorsum with light and dark, simple setae and silvery white, sericeous setae. **Genitalia:** Figure 161.

Female. Similar to male in color, vestiture, and structure. Length 8.05, width 2.74. **Head:** width across eyes 1.22, vertex 0.42. **Rostrum:** length 3.31, reaching fourth abdominal segment. **Antennae:** missing. **Pronotum:** mesal length 1.22, posterior width 2.11. The female of *aridus* is known from a single specimen.

ETYMOLOGY: From the Latin, *aridus* (dry), referring to the dry habitat of the species.

DISCUSSION: *Phytocoris aridus* is known only from the type material collected in Arizona, California, and Nevada. The host plant association is not known. Several male paratypes were taken at light. Collection dates are from April 24 to May 27.

***Phytocoris bakeri* Reuter**

Figure 162

Phytocoris bakeri Reuter, 1909: 28. – Van Duzee, 1917a: 318. – Carvalho, 1959: 191. – Knight, 1968: 229. – Henry and Stonedahl, 1983: 446.

TYPES: *Phytocoris bakeri* was described from a series of specimens collected at Claremont, Los Angeles Co., California, Baker. I have examined 10 specimens of this series: two males from the collection of the Zoological Museum, Helsinki, Finland; one male from the collection of the USNM; and five males and two females from the CAS collection. A specimen bearing Reuter's hand-printed determination label was designated a lectotype by Henry and Stonedahl (1983). The lectotype is deposited in the ZMH.

DIAGNOSIS: This species closely resembles *formosus* and *microfascinum* but is distinguished by the smaller size, 4.8–5.3, shorter first antennal segment, with greatly thickened

base and the more extensively darkened hind femora. The genital capsule lacks a tubercle above the base of the left paramere (fig. 162a) and the vesica is without a sclerotized process.

DISCUSSION: *Phytocoris bakeri* is known from Los Angeles, Riverside, San Bernardino, and San Diego counties in California. The host plant is not known, but like the allied species *formosus*, it probably occurs on an herbaceous plant. I have examined 18 specimens with collection dates from April 6 to June 19.

Phytocoris breviatus Knight

Figure 163

Phytocoris breviatus Knight, 1968: 226, 227, fig. 274.

TYPES: Described from 20 specimens collected near Mercury, Nye Co., Nevada (Nevada Test Site), 19 July to 26 August 1962 and 1965, at light (in part). The male holotype was taken at light in Area M(T), Nevada Test Site, 26 August 1965, J. M. Merino. The holotype, allotype, and 13 paratypes are retained in the Knight Collection (USNM). Four paratypes are deposited in the collection of BYU and one paratype was not located. Five additional specimens bearing Knight paratype labels are deposited at the USNM: 1 female, Mercury, Nevada, 401M(TB), VII-21-1965, E. Beck and J. Merino; 1 female, Mercury, Nevada M(T), VIII-5-1965, Joe Merino; 3 females, Mercury, Nevada, 1M(T), VII-27-1965, E. Beck and J. Merino. However, the data for these specimens were not included in the original description.

DIAGNOSIS: *Phytocoris breviatus* closely resembles *plenus* but is distinguished by the smaller size, 5.40–6.80, shorter first antennal segment, and structure of the male genitalia. The ratio of length of antennal segment I to width of head across eyes is less than 1.10:1 for males and 1.20:1 for females. The tubercle above the base of the left paramere is small (fig. 163a), the shaft of the left paramere is only slightly expanded distally (fig. 163c), and the sclerotized process of the vesica has 6–8 serrations (fig. 163e).

DISCUSSION: *Phytocoris breviatus* has been collected in southern California (Kern, Inyo, Riverside, and San Diego counties), Nevada

(Clark, Nye, and Pershing counties), and Washington Co., Utah, most frequently at light. One specimen from the paratype series was collected on *Atriplex canescens* (Pursh) Nutt. Collection dates are from May 2 to September 24.

Phytocoris conspicuus Johnston

Figure 164

Phytocoris conspicuus Johnston, 1930: 295–297, fig. 1. – Carvalho, 1959: 195.

TYPES: Described from 12 specimens collected in Colorado and Texas. The female holotype, allotype, and four female paratypes were taken at College Station, Brazos Co., Texas, 5–12 October 1928, in light trap, S. E. Jones. The holotype, allotype, and two paratypes are retained in the personal collection of H. G. Johnston and eight paratypes are deposited in the collection of the USNM.

DIAGNOSIS: Length 5.1–6.5. *Phytocoris conspicuus* is distinguished from other species of the *plenus* group by the following combination of characters: middle third of antennal segment I uniformly pale, basal and apical thirds red or reddish brown; length of antennal segment I equal to or slightly greater than width of head across eyes; corium and clavus pale grayish yellow with limited brown or reddish brown markings; and cuneus marked with red or reddish brown.

DISCUSSION: Specimens were examined from Armstrong, Bexar, and Brazos counties, Texas; Meade Co., Kansas; and an unspecified locality in Colorado. Although the distribution of this species is poorly known, it probably does not occur west of the Rocky Mts. *Phytocoris conspicuus* has not been associated with any host plants, but both sexes have been taken at light. The period of occurrence is from July 19 to October 12.

Phytocoris desertinus, new species

Figure 165

HOLOTYPE MALE: P. L. Boyd Desert Research Center, 3.5 mi S of Palm Desert, Riverside Co., California, 3 May 1974, J. D. Pinto (UCR; donated to the AMNH).

PARATYPES: ARIZONA. **Maricopa Co.:** 1 male, Sierra Estrella, 24 March 1983, J. T. and D. A. Polhemus (JTP). CALIFORNIA.

Riverside Co.: 6 males, 8 females, same locality data as holotype, 3–4 May 1974, D. L. Dickson, J. A. Mollet, J. D. Pinto, P. S. Silva, S. E. vanVorhis (UCR). **San Bernardino Co.:** 9 males, 2 females, Saratoga Spgs., 22 March 1977, black light trap, Doyen and Ulrich (UCB). **San Diego Co.:** 2 males, Anza-Borrego Desert St. Pk., Borrego Palm Cyn. Cmpgd., 180 m, 16 May 1982, at mercury vapor light, M. D. Schwartz (AMNH).

DIAGNOSIS: *Phytocoris desertinus* is distinguished from other species of the *plenus* group by the following combination of characters: antennal segment I with three dark bands on the dorsal aspect, length of segment I much greater than width of head across eyes; front tibiae with three dark annuli, leaving apices pale; left genital tubercle narrow and cylindrical (fig. 165a); and sclerotized process of vesica without serrations (fig. 165e).

DESCRIPTION: *Male.* Length 6.21–7.40, width 2.05–2.43; grayish white ground color with brown markings. **Head:** width across eyes 1.11–1.17, vertex 0.39–0.42; jugum and tylus lightly marked with reddish brown; frons usually with several faint, red or reddish brown striae laterally. **Rostrum:** length 3.29–3.47, reaching seventh or eighth abdominal segment. **Antennae:** I, length 1.55–1.84, white or pale yellow with three dark annuli; II, length 3.22–3.67, brown or yellowish brown, narrowly pale at base; III, length 1.85–2.00, brown or dark brown; IV, length 1.08–1.33, brown or dark brown. **Pronotum:** mesal length 0.99–1.13, posterior width 1.57–1.91; disk grayish white or pale yellow, sometimes with faint, brownish tinge; collar and calli usually marked with red or reddish brown; propleura pale, anterior margin sometimes lightly marked with red or reddish brown. **Scutellum:** pale, sometimes with faint brownish tinge. **Hemelytra:** grayish white or pale yellow, marked with brown particularly along outer margin of corium and lateral margins of cuneus; corium with large brown patch basally and another between anal ridge and radial vein; cuneus sometimes marked with red at apex; membrane uniformly pale or faintly conspurcate. **Legs:** femora white or pale yellow, lightly marked with brown to fuscous mostly on apical half; tibiae pale with three dark annuli; hind tibiae with long, erect, pale setae. **Vestiture:** dorsum with golden to

brown, simple setae and silvery white, sericeous setae. **Genitalia:** Figure 165.

Female. Similar to male in color, vestiture, and structure. Length 6.00–7.40, width 1.85–2.52. **Head:** width across eyes 1.06–1.22, vertex 0.38–0.43. **Rostrum:** length 3.19–3.67, reaching base of ovipositor or slightly beyond. **Antennae:** I, 1.57–1.89; II, 3.19–3.83; III, 1.91–2.00; IV, 1.12–1.30. **Pronotum:** mesal length 0.94–1.13, posterior width 1.49–1.87.

ETYMOLOGY: Named for its occurrence in desert regions.

DISCUSSION: *Phytocoris desertinus* is distributed in the Mojave and Sonoran deserts of southeastern California and southern Arizona. The host plant association is not known. Both sexes have been collected at light.

ADDITIONAL SPECIMENS: 14 specimens were examined from the following localities: **ARIZONA. Pima Co.:** Organ Pipe Nat. Mon., Drippings Spgs. (UCB). **CALIFORNIA. Riverside Co.:** Andreas Cyn. (UCR); Deep Cyn. (UCR); 3.5 mi S Palm Desert (UCR). **San Diego Co.:** Borrego Desert, Palm Cyn. (UCR). Collection dates are from April 22 to November 11.

Phytocoris electilis, new species

Figure 166

HOLOTYPE MALE: 1 mi E of Wilcox, Cochise Co., Arizona, 11 August 1973, J. D. Pinto (UCR; donated to the AMNH).

PARATYPES: **ARIZONA. Cochise Co.:** 2 females, Wilcox, 8 August 1974, ex. *Chenopodium album* L., J. D. Pinto (UCR); 1 male, Wilcox, 2 August 1975, J. D. Pinto (UCR); 2 females, 4.3 mi S Wilcox, 15 August 1975, ex. *Chenopodium album*, J. D. Pinto (UCR). **Pima Co.:** 2 males, 3 females, St. Xavier Msn., Tucson, 29 July 1924, E. P. Van Duzee (CAS, OSU); 2 males, 6 females, Tucson, 14–17 August 1916 (AMNH, OSU).

DIAGNOSIS: *Phytocoris electilis* is distinguished from other species of the *plenus* group by the pale green general coloration, with large fuscous spot on inner apical angle of corium, and the short first antennal segment (see couplet 1 in key) with middle third uniformly pale.

DESCRIPTION: *Male.* Length 4.75–5.45,

width 1.64–1.91; pale green general coloration, fading with age to yellow. **Head:** width across eyes 0.91–0.98, vertex 0.33–0.37; frons strongly convex, meeting tylus along deep depression. **Rostrum:** length 1.80–2.09, reaching between or slightly beyond hind coxae. **Antennae:** I, length 0.83–1.01, brown, middle third pale; II, length 1.66–2.14, fuscous, basal and preapical fourths pale, III, length 1.12–1.28, color pattern as in segment II; IV, length 0.90, fuscous. **Pronotum:** mesal length 0.76–0.94, posterior width 1.35–1.64; disk pale green with faint dusky markings; propleura pale. **Scutellum:** pale green; moderately convex. **Hemelytra:** pale green with dusky markings; inner apical angle of corium with large fuscous spot; anal ridge and apex of cuneus marked with red; membrane lightly to moderately marked with dusky spots. **Legs:** femora pale greenish yellow, apical third to one-half with brown or reddish brown markings; tibiae pale; front and middle tibiae with three or four narrow, brownish annuli, hind tibiae with single dark annulus proximally. **Vestiture:** dorsum with pale to golden brown, simple setae, silvery white, sericeous setae and golden, sericeous setae. **Genitalia:** Figure 166.

Female. Similar to male in color, vestiture, and structure. Length 5.67–6.10, width 2.07–2.23. **Head:** width across eyes 0.97–1.02, vertex 0.40–0.41. **Rostrum:** length 2.05–2.23, reaching between or slightly beyond hind coxae. **Antennae:** I, 0.95–1.03; II, 1.80–2.07; III, 1.17–1.33; IV, 0.86–0.99. **Pronotum:** mesal length 1.01–1.06, posterior width 1.69–1.80.

ETYMOLOGY: From the Latin, *electilis* (choice, fine), referring to the fine general appearance of the bug.

DISCUSSION: *Phytocoris electilis* is known only from the type material collected in southern Arizona. The host plant is *Chenopodium album*. Collection dates are from July 29 to August 17.

Phytocoris formosus Van Duzee

Figure 167

Phytocoris reuteri Van Duzee, 1914: 18, 19 (preoc. by *reuteri* Saunders).

Phytocoris formosus Van Duzee, 1916: 37 (n.n.); 1917a: 319; 1925: 89. – Knight, 1927a: 44. –

Carvalho, 1959: 199. – Knight, 1968: 223. – Henry and Stonedahl, 1983: 450, 451.

TYPES: Described from an undesignated number of specimens collected at Alpine, San Diego Co., California, 4 July and 5 August 1913, E. P. Van Duzee. Fifteen specimens of the original syntype series are retained in the Van Duzee Collection (CAS) and two specimens are deposited in the Knight Collection (USNM). After the original description, Van Duzee selected a lectotype (no. 2000) and “allotype” (no. 2001) from the original series, but did not publish an account of these actions. He tagged the remaining specimens of the syntype series with orange “paratype” labels. The male specimen selected as a lectotype by Van Duzee is designated as such by Henry and Stonedahl (1983) and is deposited in the collection of the CAS.

DIAGNOSIS: The following characters will distinguish *formosus* from other species of the *plenus* group: antennal segment I much longer than width of head across eyes, only slightly thickened basally; front tibiae with dark annulus at apex; membranous lobes of vesica greatly reduced, sclerotized process very small and club-shaped (fig. 167e).

REDESCRIPTION: Length 5.7–7.6; yellowish brown general coloration; antennae yellowish brown, segments III and IV brown to fuscous; frons moderately convex, meeting tylus along broad depression; disk pale, posterior submargin with transverse fuscous line or series of fuscous patches; propleura pale, anterior margin sometimes with reddish brown stripe; scutellum with fuscous markings laterally and anteromedially; hemelytra yellowish brown, often lightly tinged with red; claval vein, outer margin of corium, and inner apical angle of corium marked with brown; femora pale yellow, reticulated with reddish brown to dark brown; tibiae pale with brown or reddish brown markings; front and middle tibiae with four or five dark annuli.

DISCUSSION: *Phytocoris formosus* is distributed in the chaparral province of southwestern California where it occurs on *Cordylanthus filifolius* Nutt. I have examined specimens from Los Angeles, Riverside, San Bernardino, and San Diego counties. Collection dates are from June 22 to September 23.

Phytocoris hirsuticus Knight

Figure 168

Phytocoris hirsuticus Knight, 1968: 223, 224.

TYPES: Described from four females collected near Mercury, Nye Co., Nevada (Area 401M, Nevada Test Site), 20 June 1965, ex. *Atriplex canescens* (Pursh) Nutt., H. H. Knight and J. M. Merino. The holotype and two paratypes are deposited in the Knight Collection (USNM). One paratype was not located.

DIAGNOSIS: Length 6.1–7.1. *Phytocoris hirsuticus* is distinguished from other species of the *plenus* group by the pale green coloration, unicolored front tibiae, and densely distributed, long, pale setae on the legs and first antennal segment. For males, the dorsal width of the eye is less than the vertex width, and the vesica has a triserrate sclerotized process and one large lobal sclerite (fig. 168e, f).

DISCUSSION: Seventeen specimens of *hirsuticus* were examined from Inyo Co., California and Pershing Co., Nevada. The specimens from California were collected on *Atriplex* and two males from Nevada were taken at light. Collection dates are from May 18 to July 12.

Phytocoris hirtus Van Duzee

Figure 169

Phytocoris hirtus Van Duzee, 1918: 284, 285. – Carvalho, 1959: 201. – Knight, 1968: 223.

TYPES: Described from two females collected in southern California. The holotype (no. 401) was taken at Pasadena, Los Angeles Co., F. Grinnell, and the paratype at Coronado, North Island, San Diego Co., 30 June 1913, E. P. Van Duzee. Both specimens are retained in the Van Duzee Collection (CAS).

DIAGNOSIS: Length 7.0–8.5. This species closely resembles *plenus* but differs by the long, pale setae on the legs and dorsum; multiple serrations on the sclerotized process of the vesica (fig. 169e); and the narrow, cylindrical left genital tubercle (fig. 169a). The long, pale setae on the legs and dorsum will differentiate this species from *stitti*. *Phytocoris hirtus* is distinguished from *ingens* by the smaller eyes, narrow genital tubercle, and

greater number of serrations on the sclerotized process.

DISCUSSION: *Phytocoris hirtus* is distributed in the chaparral province of southwestern California from San Luis Obispo County to San Diego County. Specimens also have been collected in Maricopa and Pima counties, Arizona; Inyo Co., California; and Washington Co., Utah. The only host record is for a single female taken on *Malvastrum* in the Santa Catalina Mts., Arizona. Both sexes have been taken at light. I have examined 51 specimens with collection dates from April 19 to August 1.

Phytocoris ingens Van Duzee

Figures 2, 170

Phytocoris ingens Van Duzee, 1920: 340. – Carvalho, 1959: 202. – Knight, 1968: 235.

TYPES: *Phytocoris ingens* was described from two males and two females collected at Pasadena, Los Angeles Co., California, F. Grinnell. The male holotype (no. 687), allotype (no. 688), and one female paratype are deposited in the Van Duzee Collection (CAS). The male paratype is retained in the Knight Collection (USNM).

DIAGNOSIS: Length 7.5–8.3. Distinguished from other species of the *plenus* group by the following combination of characters: antennal segment I longer than width of head across eyes; front tibiae usually with four or five dark annuli, sometimes indistinct in paler specimens; hemelytra dull grayish yellow with scattered, dark brown or black, simple setae; legs and first antennal segment usually sparsely set with long, pale setae; dorsal width of eye of male greater than width of vertex; vesica with triserrate sclerotized process (fig. 170f) and large lobal sclerite (fig. 170e).

DISCUSSION: The distribution of *ingens* is restricted to the chaparral province of southwestern California. I have examined 65 specimens from Dulzura, San Diego Co.; north to Refugio Beach, Santa Barbara Co.; and east to Palm Springs, Riverside County. The only host plant record is for a single specimen collected on *Salvia* sp. Both sexes have been taken at light. The period of occurrence is from May 16 to August 22.

Phytocoris longihirtus Knight

Figure 171

Phytocoris longihirtus Knight, 1968: 218, fig. 257.

TYPES: Described from two specimens collected near Mercury, Nye Co., Nevada (Nevada Test Site). The male holotype was taken in Area JAL10C, Nevada Test Site, 25 April 1961, in "can pit-trap." The holotype and allotype are retained in the Knight Collection (USNM).

DIAGNOSIS: Length 5.7–7.6. *Phytocoris longihirtus* is similar to *aridus* and *reticulatus* but is distinguished by the shorter first antennal segment (see couplet 1 in key) and the long, erect setae on the legs and antennae. The tubercle above the base of the left paramere is large and strongly tapered (fig. 171a), and the sclerotized process of the vesica is continuous with the basal process (fig. 171e). The female is strongly brachypterous.

DISCUSSION: Three additional specimens of *longihirtus* were examined from near Kramer Jct., San Bernardino Co., California, and near Mercury, Nye Co., Nevada. The host plant association is not known. The types were taken in pitfall traps, indicating that *longihirtus* is at times in contact with the ground surface. It is possible that this species is nocturnal and seeks shelter in ground litter during arid daylight hours. Collection dates are from April 10 to May 20.

Phytocoris megatuberis, new species

Figure 172

HOLOTYPE MALE: 3.5 mi W of Westgard Pass Sumt. on St. Hwy. 168, 2134 m, Inyo Co., California, 12 July 1980, taken at light, G. M. Stonedahl and R. T. Schuh (AMNH).

PARATYPES: CALIFORNIA. **Inyo Co.:** 3 males, same data as holotype (USNM, CAS, OSU); 3 males, 1 female, 9 mi E Big Pine, 1920 m, 9 June 1966, ex. *Artemisia* sp. at night, W. Gagne (UCB, OSU). **NEVADA. Lyon Co.:** 4 males, 3 mi NE of Toiyabe Nat. For. Boundary on Rt. 338, 1920 m, 2 July 1983, at black light, R. T. Schuh and M. D. Schwartz (AMNH). **Nye Co.:** 2 males, 1 female, 11 mi N of Belmont, T10N R46E Sec. 26, 2195 m, 29 June 1983, ex. *Artemisia nova* (A. Nels.) Ward., R. T. Schuh and M. D. Schwartz (AMNH).

DIAGNOSIS: *Phytocoris megatuberis* is distinguished from other species of the *plenus* group by the following combination of characters: ratio of length of antennal segment I to posterior width of pronotum from 0.85:1 to 1.00:1 for males; front tibiae annulated, apical annulus fuscous; left genital tubercle notched dorsally (fig. 172a); and sclerotized process of vesica without serrations (fig. 172e).

DESCRIPTION: *Male.* Length 6.21–8.60, width 1.80–2.32; brown general coloration. **Head:** width across eyes 1.00–1.12, vertex 0.40–0.45; frons strongly convex, with 6–8 fuscous striae laterally. **Rostrum:** length 2.84–3.24, reaching seventh or eighth abdominal segment. **Antennae:** I, length 1.21–1.76, dark brown with scattered pale patches dorsally; II, length 2.47–3.47, brownish yellow, narrowly pale at base; III, length 1.24–1.67, brown to fuscous; IV, length 0.97–1.13, brown to fuscous. **Pronotum:** mesal length 0.77–1.03, posterior width 1.42–1.82; disk grayish white with brown to fuscous markings; propleura fuscous, median stripe and distal third pale. **Scutellum:** extensively infuscated; apex, midline, and anterolateral angles pale. **Hemelytra:** grayish white with brown to fuscous markings particularly along veins and on inner apical portion of corium; membrane densely conspurcate. **Legs:** femora fuscous with pale spots; tibiae pale with four or five dark annuli, usually broken by pale spots, apical annulus narrow. **Vestiture:** dorsum with suberect, black, simple setae and silvery white, sericeous setae. **Genitalia:** Figure 172.

Female. Brachypterous, wing membrane greatly reduced; similar to male in color and vestiture. Length 4.80–5.30, width 1.94–2.09. **Head:** width across eyes 1.06–1.12, vertex 0.49–0.50. **Rostrum:** length 3.05–3.20, reaching base of ovipositor. **Antennae:** I, 1.38–1.55; II, 2.68–3.00; III, 1.28–1.37; IV, 0.94–0.95. **Pronotum:** mesal length 0.65–0.72, posterior width 1.24–1.32.

ETYMOLOGY: From the Greek *megas* (large) and Latin *tuberis* (swelling), referring to the large left genital tubercle of the male.

DISCUSSION: *Phytocoris megatuberis* is distributed in southern California and southwestern Nevada. Adults have been collected on *Artemisia* and *Purshia*; males are attracted to light. This species is very similar to *quad-*

riannulipes but is distinguished by the longer first antennal segment and large, blunt genital tubercle with medial depression on dorsal surface (fig. 172a).

ADDITIONAL SPECIMENS: 27 specimens were examined from the following localities: CALIFORNIA. **Fresno Co.:** Jacalitos Cyn., 5 air mi S Coalinga (UCB). **Inyo Co.:** 9 mi W Lone Pine (UCD); 7 mi N Parcher's Camp (UCD). **Los Angeles Co.:** 2 mi NW Valermo (UCB); Little Rock Cyn. (CAS, USU). **Mono Co.:** Crooked Crk. Naval Reserve Stn. (UCB); Lee Vining Cmpgd., W of Mono Lk. (CAS). **Riverside Co.:** Desert Spg. (UCD). **San Bernardino Co.:** Phelan (UCB). NEVADA. **Esmeralda Co.:** 2 mi W Lida, 1900–1980 m (UCB, USNM). **Nye Co.:** 3.5 mi SE Manhattan, 2134 m (OSU); 2.5 mi NE Gabbs off Rt. 844 at Gabbs Rifle Range, 1463 m (AMNH); Northumberland Cyn. Rd., Toquima Mts., T14N R44E Sec. 31, 1950 m (AMNH). Collection dates are from May 1 to August 4.

Phytocoris microfascinum, new species

Figure 173

HOLOTYPE MALE: Oroville, Butte Co., California, 29 May 1926, H. H. Keifer (CAS).

PARATYPES: CALIFORNIA. 1 male, 2 females, same data as holotype (CAS, OSU); 2 females, same data as holotype except 13 and 15 July 1926 (CAS). **Fresno Co.:** 1 male, 1 female, 18 mi SW Mendota, Ciervo Hills, 10 November 1977, taken in UV light trap, J. Powell and P. Rude (UCB). **Lake Co.:** 1 female, N Fork Cache Crk., Hwy. 20, 14 May 1961, F. D. Parker (UCD). **Monterey Co.:** 1 female, Bryson, 20 May 1920, E. P. Van Duzee (CAS). **Napa Co.:** 1 female, N side Howell Mt., 2 mi NNE Angwin, 396 m, 15 October 1974, H. B. Leech (CAS). **Plumas Co.:** 1 female, 1737 m (no specific locality data given), 22 June 1966, T. Halstead (UCB). **Sacramento Co.:** 1 male, Folsom, 25 June 1936, H. H. Keifer (CAF&A). **Santa Clara Co.:** 1 male, Los Gatos, 1 July 1933, J. A. Kusche (CAS). **Santa Cruz Co.:** 1 female, Santa Cruz, 15 June 1922 (UCB). **Sutter Co.:** 1 male, M(ar)ysv(i)lle Buttes, 11 May 1928, ex. *Lotus*, H. H. Keifer (CAS). OREGON. **Jackson Co.:** 1 female, Medford, 1 August 1950, C. Fitch (UCD).

DIAGNOSIS: Recognized by the banded tibiae, front pair with dark annulus apically and the greatly reduced membranous portion of vesica, without sclerotized process (fig. 173e). Externally, this species resembles *formosus* but is easily distinguished by the absence of fuscous markings on the scutellum. *Phytocoris microfascinum* differs from *bakeri* by its larger body size and longer first antennal segment which is only slightly thickened basally.

DESCRIPTION: *Male.* Length 5.88–6.40, width 1.87–1.98; brownish yellow general coloration with red, reddish brown, or fuscous markings. **Head:** width across eyes 1.01–1.08, vertex 0.38–0.40; pale yellow with red markings on vertex, lorum, jugum, distal portion of tylus, and basal margin of buccula; frons moderately convex with several faint red striae laterally, meeting tylus along broad, deep depression; eyes occupying nearly entire height of head. **Rostrum:** length 2.40–2.66, reaching fourth or fifth abdominal segment. **Antennae:** I, length 1.34–1.51, pale yellow with extensive reticulate pattern of red or reddish brown; II, length 2.34–2.65, yellowish brown, becoming fuscous distally; III, length 1.56–1.73, dark brown or black; IV, length 0.98–1.10, dark brown or black. **Pronotum:** mesal length 0.83–0.95, posterior width 1.53–1.65; brownish yellow, posterior margin with several fuscous patches; collar and calli sometimes faintly tinged with red or reddish brown. **Scutellum:** moderately convex; uniformly brownish yellow. **Hemelytra:** brownish yellow with scattered brown markings, particularly on outer half of clavus, and inner margin and posteromedial region of corium; embolium, posterolateral angle of corium, and distal margins and apex of cuneus with red or reddish brown markings; cuneus usually with distinct pink or reddish hue; membrane moderately to densely conspurcate, veins pale, sometimes darkened anteriorly. **Legs:** femora pale yellow, sometimes more brownish yellow distally, marked with red or reddish brown spots and reticulations mostly on distal half; tibiae pale yellow with four or five red or reddish brown annuli; tarsi brownish yellow, first segment and distal half of third segment dark brown. **Vestiture:** dorsum with pale to golden, simple setae and silvery white, sericeous setae. **Genitalia:** Figure 173. Vesica

with small basal lobes only, primary membranous sac and sclerotized process obsolete (fig. 173e); genital capsule without prominent tubercles above paramere bases (fig. 173a).

Female. Similar to male in color, vestiture, and structure except eyes slightly smaller and vertex broader. Length 5.30–6.65, width 1.77–2.12. **Head:** width across eyes 0.96–1.05, vertex 0.43–0.46. **Rostrum:** length 2.44–2.65, reaching third or fourth abdominal segment. **Antennae:** I, 1.28–1.52; II, 2.17–2.60; III, 1.48–1.79; IV, 0.91–1.00. **Pronotum:** mesal length 0.78–0.98, posterior width 1.43–1.77.

ETYMOLOGY: From the Greek *mikros* (small) and Latin *fascinum* (penis), referring to the small vesica of the male.

DISCUSSION: In addition to the holotype and paratypes, several teneral specimens were collected at Yreka, Siskiyou Co., California, 21 June 1973 and 15 and 20 September 1974 (CAF&A); and a single specimen at Dales, Tehama Co., California, 28 June 1935, R. H. Beamer (KU). The only host record is for a single specimen collected on *Lotus* in Sutter Co., California. The distribution range of *microfascinum* (Jackson Co., Oregon south to Fresno and Monterey counties, California) is well north of the distributions of the related species *bakeri* and *formosus*.

Phytocoris plenus Van Duzee

Figures 159, 174

Phytocoris plenus Van Duzee, 1918: 282, 283. – Carvalho, 1959: 211. – Knight, 1968: 228, fig. 276.

TYPES: Described from four males collected in southern California. The holotype (no. 398) was taken at Keen Camp, San Jacinto Mts., Riverside Co., California, 6–12 June 1917, E. P. Van Duzee. The holotype and two paratypes are retained in the Van Duzee Collection (CAS). One paratype is deposited in the Knight Collection (USNM).

DIAGNOSIS: Distinguished from other members of the *plenus* group by the following combination of characters: antennal segment I longer than width of head across eyes (see couplet 1 in key); front tibiae annulated, with apical annulus fuscous; sclerotized process of vesica with two or three broad serrations apically (fig. 174e); and expanded distal region

of shaft of left paramere with prominent notch proximally (fig. 174c).

REDESCRIPTION: Length 6.0–8.1; brown general coloration; antennae brown to fuscous, segment I with pale spots dorsally, segment II sometimes lighter yellowish brown; frons moderately convex, usually marked with fuscous striae laterally; disk grayish white or pale brownish yellow, with brown to fuscous markings, posterior submargin of disk with broad fuscous band or series of dark patches; propleura pale, usually with one or two fuscous stripes; hemelytra grayish white or grayish yellow with brown to fuscous markings; corium usually with angular fuscous patch between anal ridge and radial vein; membrane moderately to densely conspurcate; femora white to pale brownish yellow, reticulated with brown or dark brown; tibiae pale with four or five dark annuli.

DISCUSSION: *Phytocoris plenus* is widely distributed in the western United States. I have examined several hundred specimens from Arizona, California, Idaho, Oregon, Nevada, Utah, and Washington. The northernmost records are from Mazama, Okanogan Co., Washington and Dixie, Idaho Co., Idaho. Specimens have been collected as far east as St. Anthony, Fremont Co., Idaho; Bryce Canyon Nat. Pk., Garfield Co., Utah; and Eddy Co., New Mexico. The southernmost records are from San Diego Co., California and Yuma Co., Arizona. This species occurs west to the coast ranges of Oregon and California. Adult specimens have been collected from a variety of herbaceous and shrubby plants including *Eriogonum* spp., *Mentzelia laevicaulis* (Dougl.) T.&G., *Oxytheca perfoliata* T.&G., *Phacelia distans* Benth., *Purshia* sp., and *Rhus trilobata* Nutt. In Oregon, this species was swept from dried grasses and herbs. Both sexes have been taken at light. Collection dates are from February 23 to December 2, suggesting that *plenus* is bivoltine or multivoltine at least in the southern portion of its range.

Considerable variation is seen in *plenus* over its range of distribution. Body size and some measurable characters of the head (e.g., lengths of antennal segments, width of eye and vertex) are particularly variable, even when transformed into ratios. The male gen-

italia of *plenus*, however, display much less variation and offer excellent characters for recognition of the species. The vesica has a single sclerotized process with three, rarely two, apical serrations (fig. 174e). The left genital tubercle is broad and flattened laterally (fig. 174a), and the expanded distal region of the shaft of the left paramere is notched proximally (fig. 174c).

Phytocoris quadriannulipes Knight

Figure 175

Phytocoris quadriannulipes Knight, 1968: 228, fig. 270.

TYPES: Described from seven males taken in light traps at Richfield, Sevier Co., Utah, 15 July 1929 and 29 May 1930, E. W. Davis. The holotype and five paratypes are retained in the Knight Collection (USNM). One paratype was not located.

DIAGNOSIS: Length: male, 6.5–7.6; female, 4.4–4.8, strongly brachypterous. *Phytocoris quadriannulipes* closely resembles *megatuberis* but is distinguished by the shorter first antennal segment (see couplet 21 in key) the smaller, more erect left genital tubercle (fig. 175a); and the shaft of the left paramere less abruptly expanded distally (fig. 175c).

DISCUSSION: *Phytocoris quadriannulipes* has been collected in Butte and Lemhi counties, Idaho; Lander Co., Nevada; Sevier Co., Utah; and Yakima Co., Washington. The host plant association is not known. I have examined 50 specimens with collection dates from May 21 to July 15.

Phytocoris reticulatus Knight

Figure 176

Phytocoris reticulatus Knight, 1968: 217, fig. 260.

TYPES: *Phytocoris reticulatus* was described from 11 specimens collected near Mercury, Nye Co., Nevada (Nevada Test Site) in "can pit-traps." The male holotype was taken in Area CBA10, Nevada Test Site, 11 April 1961. The holotype, allotype, and five paratypes are retained in the Knight Collection (USNM), and two paratypes are deposited in the collection of BYU. The other two paratypes were not located. One female bearing a Knight paratype label and the following la-

bel data was omitted from the original description: Mercury, Nevada, N.T.S., 23 Oct. 1961, CBA1 (USNM).

DIAGNOSIS: Length 5.5–7.8. This species closely resembles *aridus* but is distinguished by the fuscous spots behind the calli and the structure of the male genitalia. The hemelytra of *reticulatus* also tend to be more extensively infuscated, although the degree of darkening is somewhat variable. The sensory lobe of the left paramere is less prominent in *reticulatus* (fig. 176b), and the shaft is abruptly expanded distally (fig. 176c). The sclerotized process is continuous with the basal process; lateral margins of expanded distal region deflexed, forming a bowl-shaped structure (fig. 176e). *Phytocoris reticulatus* also resembles *longihirtus* but differs by the longer first antennal segment (see couplet 1 in key) and absence of long pale setae on the legs and antennae. Females of *reticulatus* occasionally have the wing membrane slightly to moderately reduced, but strongly brachypterous individuals are rare.

DISCUSSION: *Phytocoris reticulatus* is widely distributed in the Mojave and Sonoran deserts. Specimens have been collected as far north as Manhattan, Nye Co., Nevada; east to Hovenweep Nat. Mon., Montezuma Co., Colorado; and south to Organ Pipe Nat. Mon., Pima Co., Arizona. The western boundary of the distribution is formed by the southwestern mountain ranges of California and the southern tip of the Sierra Nevada Mts. The host plant association is not known. Both sexes have been collected at light. Collection dates are from March 18 to December 17.

Phytocoris roseus (Uhler)

Figure 177

Compsocerochoris roseus Uhler, 1894: 253, 254.

Phytocoris roseus: Reuter, 1909: 27, 28. – Van Duzee, 1914: 19; 1917a: 318. – Carvalho, 1959: 214. – Knight, 1968: 249. – Henry and Stone-dahl, 1983: 459.

Phytocoris barbatus Van Duzee, 1920: 353, 354. – Carvalho, 1959: 214 (synonymy).

TYPES: In the original description of *roseus*, Uhler refers to a single specimen from San Borja, Mexico, and a pair from Los Angeles, California. A type specimen was not desig-

nated in the original description. I have examined one male specimen with label data "San Borja, Lower Cal., Mex., Chas D. Haines, May 1889;" "778;" male; "LECTOTYPE *roseus*" (handwritten). The red lectotype label was probably applied by E. P. Van Duzee, but no type designation was published. The above specimen was designated a lectotype by Henry and Stonedahl (1983) and is retained in the collection of the CAS (Type no. 557).

The junior synonym, *barbatus*, was described from a single male collected at Pasadena, Los Angeles Co., California, F. Grinnell. This specimen is deposited in the Van Duzee Collection (CAS), type number 710.

DIAGNOSIS: *Phytocoris roseus* is distinguished from other *plenus* group species by the red tinge or markings on the hemelytra, long first antennal segment, fuscous second antennal segment with pale median annulus, and the annulated tibiae. The sclerotized process of the vesica has three or four large serrations (fig. 177e).

REDESCRIPTION: Length 5.6–7.3; pale yellow general coloration, variously marked or tinged with red; antennae fuscous; segment I with scattered pale patches, length equal to or greater than posterior width of pronotum; segment II with broad, pale annulus medially; frons strongly convex, meeting tylus along deep depression; disk white or pale yellow; collar and calli marked with fuscous in darker specimens; propleura pale, sometimes tinged with red; hemelytra pale yellow, lightly to extensively tinged with red, sometimes marked with fuscous along claval suture; membrane lightly to densely conspurcate; femora pale yellow, reticulated with reddish brown to fuscous; tibiae with 3–5 dark annuli.

DISCUSSION: *Phytocoris roseus* is widely distributed in the chaparral province of southwestern California from San Diego County north to San Benito County. Specimens also have been collected in Maricopa and Pinal counties, Arizona; Inyo Co., California; and Washington Co., Utah. The host plant of this species is *Eriogonum fasciculatum* Benth. Both sexes have been taken at light. I have examined several hundred specimens with collection dates from April 28 to August 10.

Phytocoris sanjoaquin, new species

Figure 178

HOLOTYPE MALE: 18 mi SW of Mendota, Ciervo Hills, Fresno Co., California, 10 November 1977, taken in UV light trap, J. Powell and P. Rude (UCB).

PARATYPES: CALIFORNIA. **Tulare Co.:** 1 male, Strathmore, 1 October 1935, taken at light, Timberlake (UCR).

DIAGNOSIS: Recognized by the yellowish white general coloration with red markings on the head, pronotum, and legs. Front tibiae without dark annuli; and vesica with triserate sclerotized process and large lobal sclerite (fig. 178e, f).

DESCRIPTION: *Male.* Length 6.30–6.65, width 2.10–2.30; yellowish white general coloration with red markings on the lorum, lateral margins of collar, calli, apices of femora, base of hind tibiae, sternum, and lateral margins of abdomen. **Head:** width across eyes 1.08–1.13, vertex 0.35–0.39; lorum *roseus*; frons moderately convex, meeting tylus along broad, deep depression; eyes occupying nearly entire height of head. **Rostrum:** length 2.34–2.47, reaching apices of hind coxae. **Antennae:** I, length 1.60, uniformly pale yellow; II, length 2.80, yellowish brown; III, length 1.69, yellowish brown; IV, missing. **Pronotum:** mesal length 0.98, posterior width 1.73–1.77. **Scutellum:** weakly convex, uniformly pale; mesoscutum tinged with red. **Hemelytra:** yellowish white; clavus between vein and commissure, and inner margin and apex of cuneus marked with brown; corium marked with oblique brownish fascia between anal ridge and radial vein; membrane moderately sprinkled with dark spots, coalescing into larger maculate patches along outer margin of membrane and within areolar cells. **Legs:** femora pale yellow proximally, distal fourth to one-half extensively marked with red or brownish red; tibiae uniformly pale yellow, sometimes lightly tinged with red basally; tarsi and extreme apex of tibiae brownish yellow. **Vestiture:** dorsum with pale and golden brown, simple setae and silvery white, sericeous setae. **Genitalia:** Figure 178.

Female. Unknown.

ETYMOLOGY: Named for its occurrence in the San Joaquin Valley; a noun in apposition.

DISCUSSION: This species is known only from the holotype and single paratype collected at light in California. It closely resembles *formosus* and *microfascinum* but is easily distinguished from these species by the uniformly pale first antennal segment, tibiae without dark annuli, and by the structure of the male genitalia.

Phytocoris seminotatus Knight

Figure 179

Phytocoris seminotatus Knight, 1934: 7, 8. – Carvalho, 1959: 216. – Knight, 1968: 216.

TYPES: Described from 13 specimens collected in southeastern Arizona. The male holotype and allotype were taken at Tucson, Pima Co., 19 September 1928, A. A. Nichol. These specimens and a single female paratype are retained in the Knight Collection (USNM). Seven paratypes are deposited in the collection of the CAS; three paratypes were not located.

In the original description of this species, Knight (1934) incorrectly recorded one male and one female paratype from Texas Canyon, Chiricahua Mts., Arizona, Oct. 14, 1927 (J. A. Kusche). The date and collector are correct, but the locality data on the label read: "Patagonia, Ariz., on Sonoita Cr."

DIAGNOSIS: Length 6.8–7.7. *Phytocoris seminotatus* closely resembles *hirsuticus* but is distinguished by the pale yellowish brown general coloration, reddish brown markings on the hind femora, and structure of the male genitalia, particularly the narrow, erect left genital tubercle (fig. 179a), and broadly rounded sensory lobe of the left paramere (fig. 179b). The sclerotized process of the vesica has three or four strong, apical serrations subtended by several smaller serrations (fig. 179e).

DISCUSSION: I have examined 26 specimens of *seminotatus* from Cochise, Pima, and Santa Cruz counties, Arizona, and Lea Co., New Mexico. Collection dates are from September 8 to October 27. The specimens from New Mexico were collected on *Artemisia ludoviciana* Nutt. Knight (1934) stated that A. A. Nichol collected the type and allotype on "grasses," but this information was not included with the label data.

Phytocoris sierrae, new species

Figure 180

HOLOTYPE MALE: End of Stump Spgs. Rd. to Aspen Mdw., W of Huntington Lk., 1935 m, Fresno Co., California, 25 August 1971, H. B. Leech (CAS).

PARATYPES: CALIFORNIA. **Eldorado Co.:** 1 male, Bijou, near Lk. Tahoe, 1981 m, 30 August 1965, G. A. Gorelick (UCB). **Fresno Co.:** 3 males, same data as holotype (CAS, OSU). **Mariposa Co.:** 1 male, Yosemite Nat. Pk., 1 August 1940, L. C. Kuitert (KU). **Placer Co.:** 1 male, Kaspian Rec. Area, 5 mi S Tahoe City, 20 August 1980, taken at UV light, J. DeBenedictis and J. Powell (UCB); 1 male, Silver Crk., 1860 m, near Lk. Tahoe, 10 September 1973, at light, E. I. Schlinger (UCB); 1 male, Tahoma, 1916 m, 29 July 1974, E. L. Smith (CAS). **Plumas Co.:** 2 males, Johnsville, 2 September 1967, light trap, H. Pini (CAF&A); 1 male, 1 mi W Johnsville, 18 July 1973, R. A. Belmont (CSU); 3 males, 4 mi W Quincy, 12 and 14 July 1949, R. L. Langston (LACM); 1 female, 4 mi W Quincy, 18 July 1949, E. L. Atkinson (UCB). **Tuolumne Co.:** 2 males, 2 females, Strawberry, 5–12 August 1960, D. Q. Cavagnaro (UCD).

DIAGNOSIS: Recognized by the brown general coloration; long first antennal segment; banded tibiae, front pair with dark annulus apically; and sclerotized process of vesica with three or four prominent serrations distally (fig. 180e, f). Externally, this species is very similar to *plenus*, but differs by the larger eyes and narrower vertex, less pronounced left genital tubercle (fig. 180a), and smaller sclerotized process of the vesica, or if similar in size, then distal serrations narrower (fig. 180e, f).

DESCRIPTION: *Male.* Length 6.50–8.15, width 2.14–2.50; brown general coloration. **Head:** width across eyes 1.07–1.22, vertex 0.31–0.34; pale brownish yellow with reddish brown or fuscous markings; frons moderately convex, meeting tylus along broad depression; eyes large, occupying entire height of head; antennal fossae inserted near middle of eye. **Rostrum:** length 2.51–3.20, reaching third or fourth abdominal segment. **Antennae:** I, length 1.45–1.70, fuscous with 4–6 white spots dorsally, ventral surface mostly pale except

darkened apically and narrowly at base, dorsal and lateral margins with scattered, erect, pale, bristlelike setae; II, length 2.60–3.20, brown or yellowish brown, apex sometimes slightly darker; III, length 1.77–1.95, dark brown; IV, length 1.17–1.26, dark brown. **Pronotum:** mesal length 0.88–1.06, posterior width 1.53–1.87; grayish yellow, posterior lobe usually tinged with brown; collar, calli, lateral and posterior margins, and postero-medial region of disk moderately to extensively darkened with brown or fuscous; propleura mostly pale, extreme basal margin and anteromedial ray reddish brown or fuscous. **Scutellum:** moderately convex; pale grayish yellow with fuscous markings; apex and anterolateral angles uniformly pale. **Hemelytra:** grayish yellow, moderately to extensively tinged and marked with brown and fuscous; posteromedial region of corium with large oblique fuscous patch; clavus bordering vein, embolium, and distal half of cuneus sometimes more extensively darkened and marked with pale spots; anterior half and extreme apex of cuneus mostly pale; membrane moderately to densely conspurcate, veins darkened, except pale and sometimes tinged with red distally. **Legs:** femora pale yellow with reddish brown or fuscous, reticulate markings mostly on apical half; tibiae pale with five fuscous annuli, usually broken by pale spots. **Vestiture:** dorsum with short, dark, simple setae and silvery white, sericeous setae, the latter sometimes arranged in clusters. **Genitalia:** Figure 180.

Female. Similar to male in color, vestiture, and structure except eyes slightly smaller and vertex relatively broader. Length 7.10–7.65, width 2.20–2.50. **Head:** width across eyes 1.07–1.13, vertex 0.39–0.45. **Rostrum:** length 2.70–3.15, reaching fourth abdominal segment. **Antennae:** I, 1.56–1.72; II, 2.51–2.90; III, 1.78–2.00; IV, 1.17–1.27. **Pronotum:** mesal length 1.03–1.07, posterior width 1.76–1.90.

ETYMOLOGY: Named for the Sierra Nevada Mts.; a noun in the genitive case.

DISCUSSION: *Phytocoris sierrae* is distributed in the Sierra Nevada Mts. from Plumas County south to Fresno County. Sixteen specimens also were examined from Tanbark Flat, Los Angeles County and Mill Crk., San Bernardino County. Specimens from the lat-

ter locality (Mill Crk.) differed from all others examined by the slightly smaller body size and much smaller sclerotized process of the vesica with less produced distal serrations. Specimens from the Sierra Nevada Mts. also exhibited variation in the size of the sclerotized process and its distal serrations (figs. 180e, f). However, due to the homogeneity in external appearance and lack of variation in other genitalic structures of the male, all specimens examined were considered to be conspecific with the type from Fresno County, including those from Mill Crk. and Tanbark Flat.

Several individuals from the Mill Crk. locality were taken on *Cordylanthus nevinii* Gray and *Eriogonum* sp. The remaining specimens of this series, as well as several individuals from Placer and Plumas counties, were taken at light. Collection dates are from June 25 to September 10.

Phytocoris solano, new species

Figure 181

HOLOTYPE MALE: Vacaville, Solano Co., California, 25 July 1948, A. T. McClay (UCD).

PARATYPES: CALIFORNIA. 1 male, same data as holotype except 4 September 1947 (UCD). **Colusa Co.:** 1 male, 1 female, 5 mi S Arbuckle, 13 August 1959, B. N. Chaniotis (UCD, OSU). **Fresno Co.:** 1 female, Ciervo Hills, 18 air mi SW Mendota, 16 March 1975, at light, J. T. Doyen (UCB).

DIAGNOSIS: Recognized by the following characteristics: antennal segment I longer than width of head across eyes; antennal segment II with pale, median annulus; front tibiae annulated, apical annulus fuscous; left genital tubercle broad, flattened laterally (fig. 181a); and sclerotized process of vesica with 8–10 serrations (fig. 181e). *Phytocoris solano* closely resembles *desertinus* but differs by the dark apices of the front tibiae, pale annulus at middle of antennal segment II, broader genital tubercle, and the serrate sclerotized process.

DESCRIPTION: *Male.* Length 6.59–6.64, width 2.00–2.09; grayish yellow ground color with brown markings. **Head:** width across eyes 1.07–1.12, vertex 0.40–0.42; buccula, jugum, lorum, and tylus marked with reddish brown; frons moderately convex, marked with sev-

eral reddish striae laterally. **Rostrum:** length 2.97–3.19, reaching seventh or eighth abdominal segment. **Antennae:** dark brown; I, length 1.39–1.44, with three pale annuli; II, length 2.70, with broad pale annulus medially; III, length 1.64; IV, length 1.35. **Pronotum:** mesal length 0.93–0.99, posterior width 1.53–1.62; disk pale grayish yellow, lightly marked with brown; collar and calli with reddish brown markings; propleura pale, lightly infuscated basally, anterior margin with reddish brown stripe medially. **Scutellum:** pale, lightly marked with reddish brown, usually with fuscous fascia either side before apex. **Hemelytra:** pale grayish yellow, with limited brown or fuscous markings; corium with angular fuscous patch between anal ridge and radial vein; margins of cuneus marked with brown or fuscous; membrane lightly to moderately conspurcate. **Legs:** femora white or pale yellow with reddish brown to fuscous markings; tibiae pale, front and middle pair with four or five fuscous annuli; hind tibiae with two dark annuli. **Vestiture:** dorsum with light and dark, simple setae and silvery white, sericeous setae. **Genitalia:** Figure 181.

Female. Similar to male in color, vestiture, and structure. Length 6.80, width 2.16. **Head:** width across eyes 1.09, vertex 0.44. **Rostrum:** length 3.13, reaching fifth abdominal segment. **Antennae:** I, 1.53; II, 2.92; III and IV, missing. **Pronotum:** mesal length 0.99, posterior width 1.58. The measurements for the female were taken from the specimen collected in Colusa County.

ETYMOLOGY: Named for the county of the type locality; a noun in apposition.

DISCUSSION: *Phytocoris solano* is known only from the type material collected in Colusa, Fresno, and Solano counties, California. A single female in very poor condition also was collected in the Panamint Valley, Inyo Co., California (CAS). Collection dates are from March 14 to September 4. Although the host plant association is not known, this species probably occurs on a small shrub or perennial herb.

Phytocoris stitti Knight
Figures 160, 182

Phytocoris stitti Knight, 1961: 474, 476, fig. 2; 1968: 228, fig. 275.

Phytocoris albiceps Knight, 1968: 234, 235, fig. 277. NEW SYNONYMY.

Phytocoris merinoi Knight, 1968: 227, fig. 271. NEW SYNONYMY.

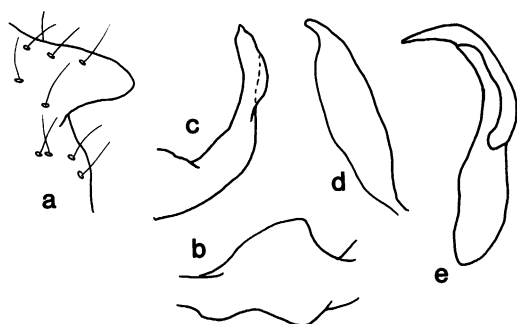
TYPES: *Phytocoris stitti* was described from three males taken at Tucson, Pima Co., Arizona, 9–10 April 1942, L. L. Stitt. All type material is retained in the Knight Collection (USNM).

The junior synonym, *albiceps*, was described from 10 specimens collected in southern California and southwestern Arizona. The male holotype, allotype, and six male paratypes were taken at Barstow, San Bernardino Co., California, 21 May 1938, J. Standish. All type material is retained in the Knight Collection (USNM) except one paratype that was not located.

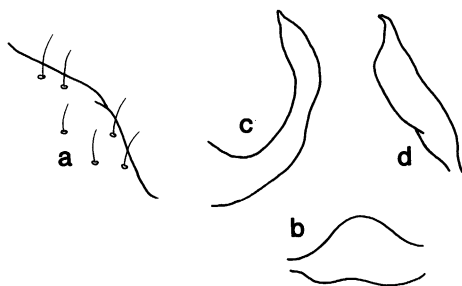
The junior synonym, *merinoi*, was described from 13 specimens collected near Mercury, Nye Co., Nevada (Nevada Test Site). The male holotype, allotype, and six paratypes were taken in Area 16M, Nevada Test Site, 11 June 1965, ex. *Grayia spinosa* (Hook.), H. H. Knight and J. M. Merino. The holotype, allotype, and eight paratypes are retained in the Knight Collection (USNM), and two paratypes are deposited in the collection of BYU.

DIAGNOSIS: Length 6.5–9.1. *Phytocoris stitti* is distinguished from allied species by the following combination of characters: legs and antennal segment I without long, pale setae; hemelytra with sparsely distributed, dark simple setae; dorsal width of eye of male about equal to width of vertex; left genital tubercle narrow and cylindrical (fig. 182a); and sclerotized process of vesica with 8–10 serrations (fig. 182e). The front tibiae are usually annulated, but the bands are sometimes indistinct on pale specimens.

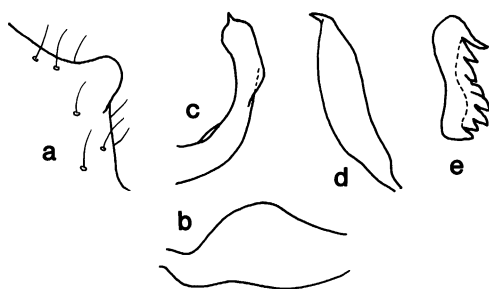
DISCUSSION: *Phytocoris stitti* is widely distributed in the Mojave and Sonoran deserts. Specimens have been collected as far north as Lone Pine, Inyo Co., California; and Mercury, Nye Co., Nevada. The easternmost record is Tucson, Pima Co., Arizona. The western boundary of the distribution is formed by the southwestern mountain ranges of California and the southern tip of the Sierra Nevada Mts. Adults have been collected on *Franseria deltoidea* (Torr.) Payne, *F. dumosa*



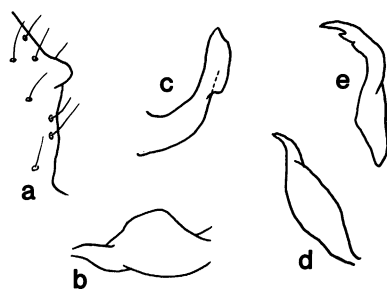
161 aridus



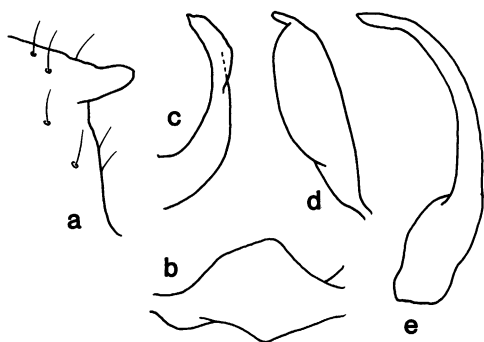
162 bakeri



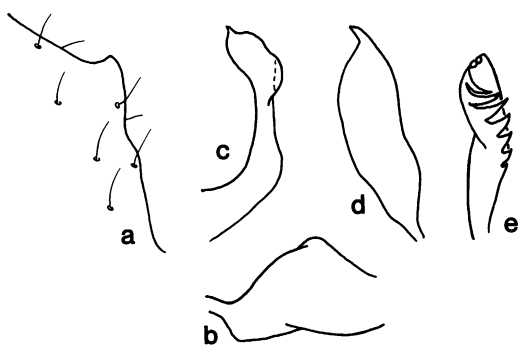
163 brevatus



164 conspicuus



165 desertinus



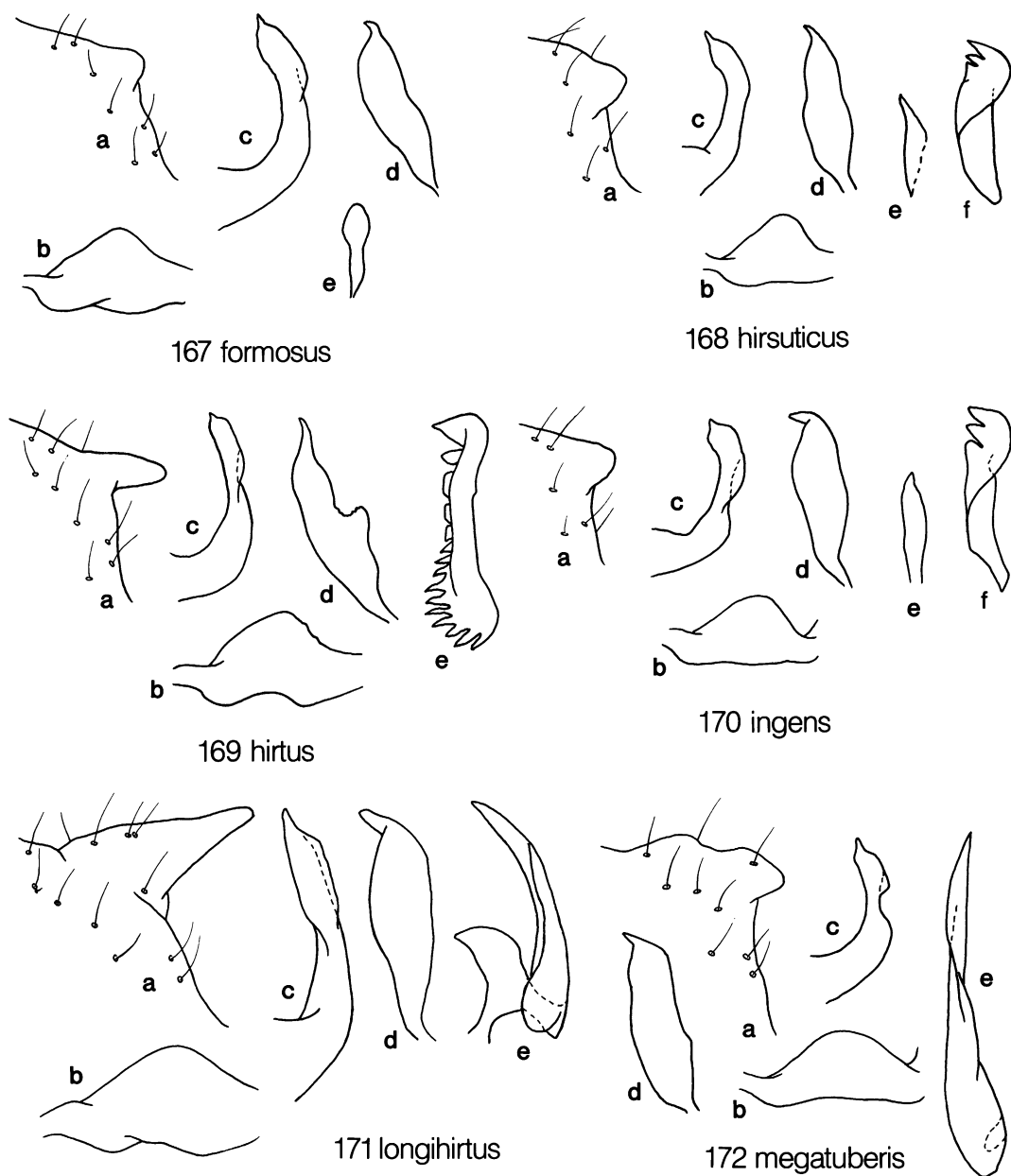
166 electilis

Figs. 161–166. Male genitalia of *plenus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

(Gray) Payne, *Grayia spinosa* (Hook.) Moq., *Hymenoclea monogyra* T.&G., *H. salsola* T.&G., *Lycium andersonii* Gray., *Purshia tridentata* (Pursh) DC., *Salazaria mexicana* Torr., and *Sphaeralcea* sp. Males and females

are attracted to light. I have examined several hundred specimens with collection dates from March 9 to June 26.

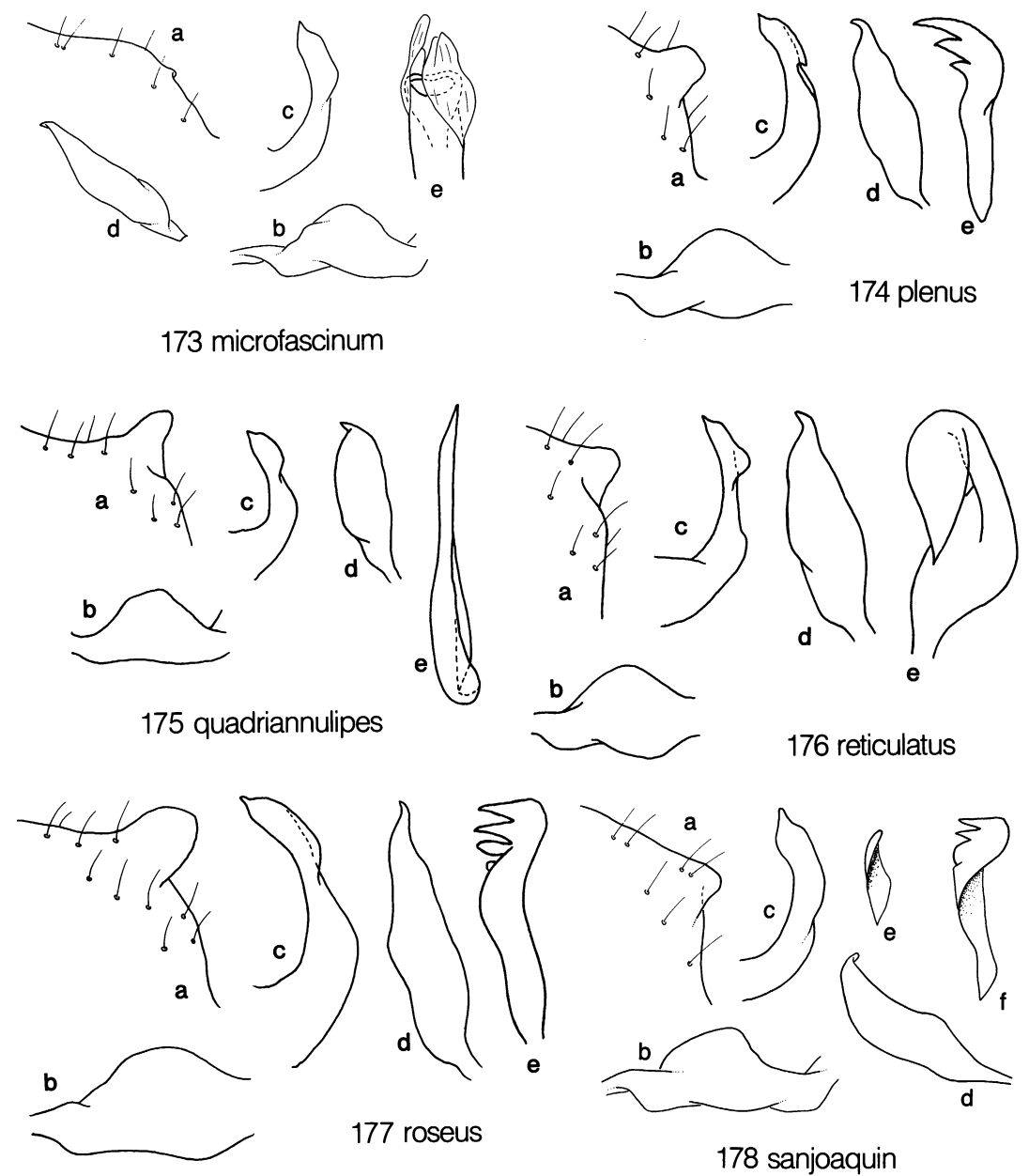
Phytocoris albiceps and *merinoi* are here placed in synonymy with *stitti* on the basis



Figs. 167–172. Male genitalia of *plenus* group species. 167. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica. 168. a–d as in fig. 167. e. Lobal sclerite of vesica. f. Sclerotized process of vesica. 169. a–e as in fig. 167. 170. a–f as in fig. 168. 171, 172. a–e as in fig. 167.

of the indistinguishable genitalic structures of the males. Externally, the holotypes of *albiceps* and *merinoid* differ from *stitti* only in the lighter general coloration. *Phytocoris stitti* ranges in color from white with limited dusky

markings to specimens that are extensively darkened with brown or dark brown. Females have slightly shorter hemelytra than males but the wing membrane is always well developed.

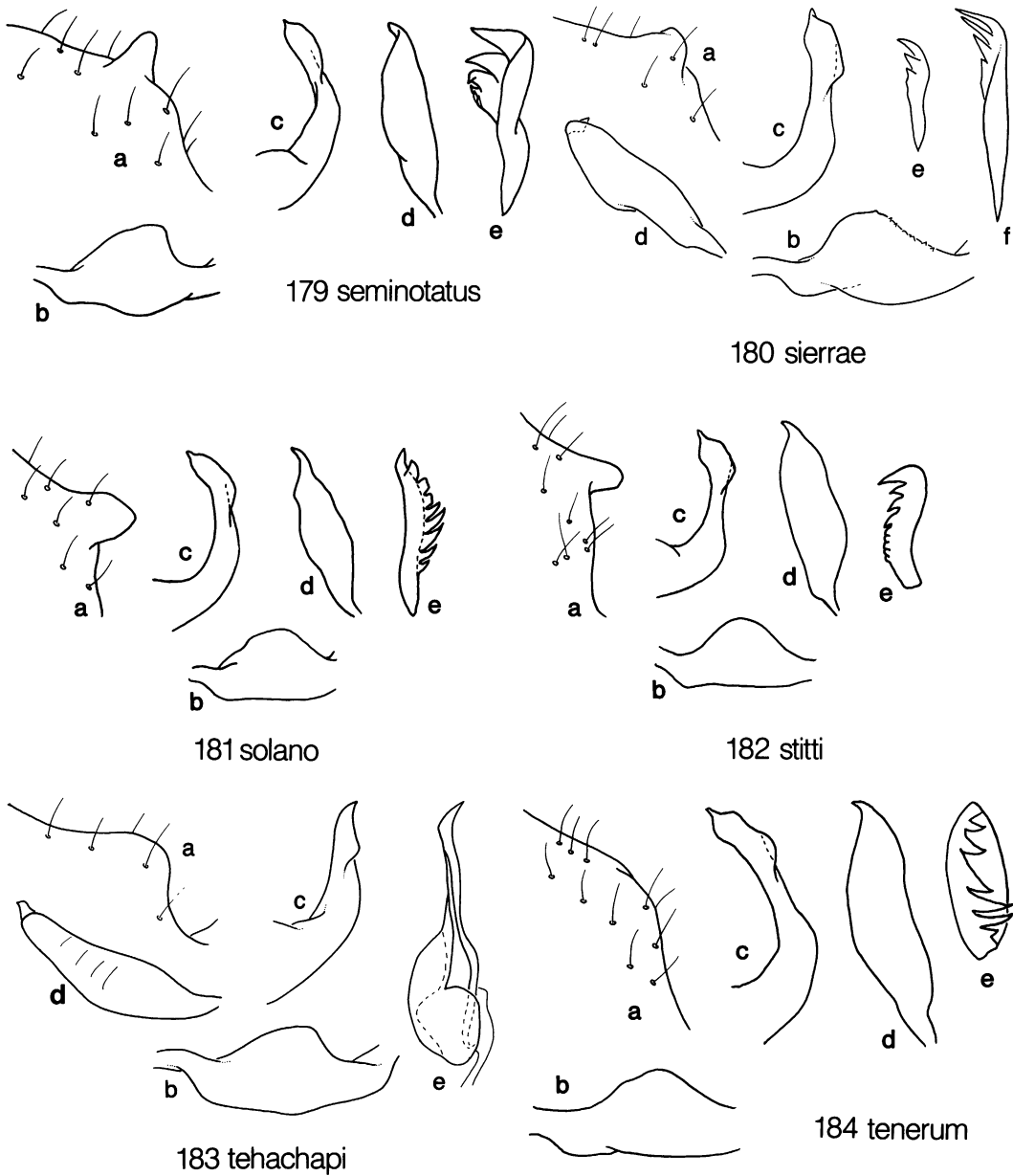


Figs. 173–178. Male genitalia of *plenus* group species. 173. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Vesica. 174–177. a–d as in fig. 173. e. Sclerotized process of vesica. 178. a–d as in fig. 173. e. Lobal sclerite of vesica. f. Sclerotized process of vesica.

***Phytocoris tehachapi*, new species**
Figure 183

HOLOTYPE MALE: Tehachapi Mt. Pk., 8 mi SW of Tehachapi, 1970 m, Kern Co., California, 13 August 1980, C. E. Griswold (UCB).

DIAGNOSIS: Distinguished from all other species of the *plenus* group by the structure of the male genitalia (fig. 183), particularly the shape of the sclerotized process of the vesica, and the genital capsule without tubercles above paramere bases. Additional di-



Figs. 179–184. Male genitalia of *plenus* group species. 179. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica. 180. a–d as in fig. 179. e, f. Sclerotized process of vesica. e. Fresno Co., California. f. Eldorado Co., California. 181–184. a–e as in fig. 179.

agnostic features are first antennal segment much longer than width of head across eyes; front tibiae with dark annulus at apex; and posterior lobe of pronotum, scutellum, and proximal region of cuneus with faint pinkish tinge.

DESCRIPTION: *Male*. Length 7.00, width

2.20; brown general coloration; pronotal disk, scutellum, and cuneus with faint pinkish tinge. **Head**: width across eyes 1.13, vertex 0.46; grayish yellow with reddish brown to fuscous markings; frons moderately convex, meeting tylus along broad, shallow depression; eyes occupying slightly less than two-thirds of head

height; lower margin of antennal fossa slightly above ventral margin of eye. **Rostrum:** length 3.50, reaching well beyond apices of hind coxae. **Antennae:** I, length 1.60, dark brown with scattered pale patches and long erect bristlelike setae, ventral surface mostly pale; II, length 2.85, yellowish brown, darker brown distally; III, length 1.43, dark brown; IV, length 1.18, dark brown. **Pronotum:** mesal length 1.12, posterior width 1.83; grayish yellow, posterior lobe with faint pinkish tinge; collar and calli with fuscous markings; propleura with basal third and broad antero-medial ray fuscous, distal region pale. **Scutellum:** moderately convex; grayish yellow with fuscous markings and faint pinkish tinge; midline, apex, and anterolateral angles mostly pale. **Hemelytra:** gray or yellowish gray with extensive fuscous markings; corium bordering radial vein with faint pink tinge; embolium with alternating light and dark patches; cuneus mostly pale basally with pink tinge, distal region with extensive fuscous markings; membrane densely conspurcate, veins pale distally. **Legs:** femora yellow or grayish yellow with reticulate pattern of brown or reddish brown; tibiae pale with four fuscous annuli, apical annulus narrow. **Vestiture:** dorsum with light and dark, simple setae and silvery white, sericeous setae, the latter sometimes arranged in clusters. **Genitalia:** Figure 183.

Female. Unknown.

ETYMOLOGY: Named for its occurrence in the Tehachapi Mts.; a noun in apposition.

DISCUSSION: Known only from the male holotype taken in Kern Co., California. The host plant association is not known.

***Phytocoris tenerum*, new species**

Figure 184

HOLOTYPE MALE: 14 mi E of Brawley, Imperial Co., California, 28 April 1973, J. Schuh (AMNH).

PARATYPES: CALIFORNIA. 7 females, same data as holotype (AMNH). **Riverside Co.:** 18 mi W Blythe: 29 April 1952, 1 male taken at light; 13–18 April 1958, 1 male taken on *Coldenia plicata* (Torr.) Cov., 1 male taken on *Nama hispidum* Gray, 1 male, 4 females collected at light (UCR).

DIAGNOSIS: Distinguished from other

members of the *plenus* group by the following combination of characters: ratio of length of antennal segment I to width of head across eyes less than 1.10:1 for males and 1.20:1 for females; paracuneus marked with fuscous spot; and genital capsule without tubercle above base of left paramere (fig. 184a). *Phytocoris tenerum* is most similar to *electilis* but differs by the larger size, pale brownish yellow general coloration, strongly convex scutellum, and antennal segment I without broad, pale region medially.

DESCRIPTION: *Male.* Length 6.37–7.56, width 1.98–2.50; yellow or pale brownish yellow general coloration, sometimes with faint reddish tinge. **Head:** width across eyes 0.95–1.12, vertex 0.30–0.36; frons moderately convex, meeting tylus along broad depression. **Rostrum:** length 2.52–2.88, reaching fourth abdominal segment. **Antennae:** brownish yellow, segments III and IV sometimes darker brown; I, length 0.88–1.13, with red to brown markings; II, length 2.29–2.57; III, length 1.04–1.24; IV, length 0.38–0.54. **Pronotum:** mesal length 0.88–1.08, posterior width 1.55–1.89; disk pale yellow, tinged or marked with brown or reddish brown; collar, calli, and posterior submargin of disk usually marked with fuscous; calli prominent, bordered posteriorly by deep impressed line; propleura pale, anterodorsal angle sometimes lightly infuscated. **Scutellum:** strongly convex; pale, usually with dark spot or stripe either side before apex. **Hemelytra:** yellow or pale brownish yellow with brown to fuscous markings, sometimes with faint reddish tinge; paracuneus marked with fuscous spot; membrane conspurcate. **Legs:** femora pale yellow or brownish yellow, lightly marked with reddish brown to fuscous mostly on apical third to one-half; tibiae pale; front and middle tibiae usually with three dark annuli. **Vestiture:** dorsum with pale to golden, simple setae and silvery white, sericeous setae; sericeous setae on pronotal disk and hemelytra mostly grouped into scattered, subcircular patches. **Genitalia:** Figure 184.

Female. Similar to male in color, vestiture, and structure. Length 5.94–7.24, width 2.09–2.66. **Head:** width across eyes 0.98–1.12, vertex 0.41–0.48. **Rostrum:** length 2.70–3.13, reaching fourth or fifth abdominal segment.

Antennae: I, 0.90–1.08; II, 1.60–2.23; III, 0.82–1.12; IV, 0.49–0.54. **Pronotum:** mesal length 0.93–1.19, posterior width 1.64–2.09.

ETYMOLOGY: From the Latin, *tenerum* (soft, delicate), referring to the general appearance.

DISCUSSION: This species is distributed in the Mojave and Sonoran deserts where it occurs on herbaceous plants. Adults have been collected from *Abronia*, *Chaenactis*, *Coldenia*, *Haplopappus*, *Nama*, and *Verbena*. Both sexes have been taken at light.

ADDITIONAL SPECIMENS: 103 specimens were examined from the following localities: **ARIZONA.** **Maricopa Co.:** Mesa (OSU). **Pima Co.:** Ajo Mts., the Alamo (USNM). **Yuma Co.:** Ehrenberg (USNM); Yuma (NAU,

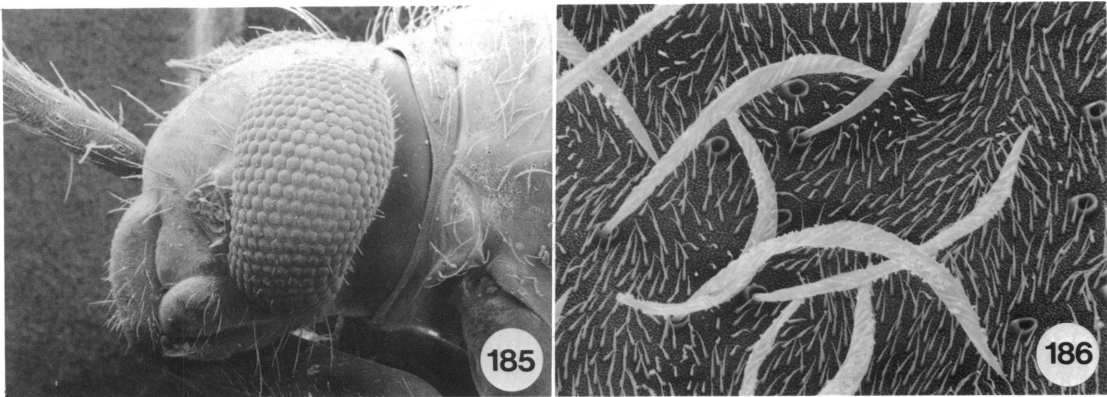
UAZ, USNM). **CALIFORNIA.** **Kern Co.:** El Paso Mts., Iron Cyn. (UCB). **Imperial Co.:** El Centro (CAF&A); Glamis (CAF&A); 3.5 mi NW Glamis (CAF&A, UCR); Picacho St. Rec. Area (KU). **Riverside Co.:** Andreas Cyn. (UCR); Blythe (OSU); Hopkins Well (UCB); Palm Springs (UCR, USNM); 9 km E Thousand Palms Sand Dunes (UCR); 3 mi S Whitewater (UCB). **San Bernardino Co.:** 9 air mi S Baker (UCB); 16 mi SW Baker (UCB); 23 mi SW Baker, Afton Rd. (UCB); Needles (CAS); San Bernardino (CAS); 16 mi NE Twentynine Palms (UCB). **San Diego Co.:** Borrego Valley (UCD, UCR). Collection dates are from August 10 to May 1.

PULCHELLUS SPECIES-GROUP

DIAGNOSIS: Recognized by the pale greenish yellow or brownish yellow general coloration, with distinct red or brownish red markings, especially on pronotal disk, cuneus, and femora; dorsum without scalelike setae; and structure of the male genitalia, especially the sclerotized process of the vesica with 6–14 coarse, marginal serrations, and primary membranous sac usually with patches of tiny, dispersed tubercles.

DESCRIPTION: Small to moderate, 4.5–5.8, pale greenish yellow or brownish yellow species with red or brownish red markings; sometimes also with limited brown or fuscous markings; vestiture of dorsum with pale, simple setae and silvery white, sericeous setae, pronotal disk sometimes with dark simple setae, or in *rubroornatus* with limited black, scalelike setae. **Head:** height slightly greater than length in lateral view, sometimes nearly quadrate; pale yellow or brownish yellow with red markings; frons moderately convex, noticeably produced anteriorly of antennal fossae in lateral view, meeting tylus along broad depression; tylus weakly to moderately produced basally; antennae pale yellow or brownish yellow, segment I sometimes marked with red or brown dorsally; eyes occupying about three-fourths of height of head in lateral view. **Pronotum:** disk variously colored, sometimes pale yellow with broad reddish orange vittae, or brownish yellow with reddish orange markings on anterior lobe, and posterior lobe broadly suffused or flecked with

brown, or entire disk brownish red or deep ruby red; posterior submargin of disk sometimes with several weakly elevated, tumid points; propleura pale, lightly to moderately marked or tinged with red or brown dorsally. **Hemelytra:** yellow, greenish yellow, or pale brownish yellow, sometimes with large reddish orange maculae on clavus and anterior half of corium, or clavus and corium broadly suffused and/or flecked with brown; cuneus and paracuneus usually marked with red or brownish red, sometimes nearly entirely reddened; membrane mottled with dusky spots or uniformly suffused with pale fuscous. **Legs:** femora pale brownish yellow, sometimes lightly marked with red or brown; hind femora with reticulate pattern of red or reddish brown distally, or extensively reddened and marked with pale spots; tibiae pale, usually with limited brown or reddish brown markings; front tibiae sometimes with three faint, dark annuli; hind tibiae sometimes with broad red band basally. **Male genitalia:** genital capsule with well developed tubercle above base of left paramere. **Left paramere:** sensory lobe weakly to strongly produced, sometimes with prominent tubercles on inner-distal surface; shaft variable, long, and slightly expanded distally, or shorter and more broadly expanded; basal region of shaft sometimes with strong surface tubercles; apex narrowly rounded. **Right paramere:** elongate to broadly lanceolate, sometimes with spinose process or series of strong spines dorsally; apex acute.



Figs. 185, 186. *Phytocoris olseni*. 185. Lateral view of head. 186. Sericeous setae of dorsal vestiture.

Vesica: primary membranous sac multi-lobed, lobes usually with patches of tiny dispersed tubercles, basal lobes well developed; sclerotized process, except *rubroornatus*, with 6–14 coarse, marginal serrations, basal half to three-fourths of process attached to primary membranous sac; basal process heavily sclerotized, extending well above level of gonopore, joined to base of sclerotized process by narrow membranous region.

DISCUSSION: The *pulchellus* group comprises five species distributed primarily in steppe and plateau regions of southern Colorado, central and southwestern Arizona, and western New Mexico. *Phytocoris olseni* and *quercicola* also occur in the Chihuahuan Desert Province of southern New Mexico and western Texas, and are reported from a number of midwestern and east coast states by Knight (1941). With the exception of *rubroornatus*, *pulchellus* group species are inhabitants of oak and sycamore. The former species occurs on barberry (*Berberis*).

Pulchellus group species are most closely related to a complex of species distributed in the eastern United States (i.e., Group IV of Knight, 1941). Based on external morphology and the structure of the male genitalia, Knight's Group IV, exclusive of *taxodii* Knight, appears to be monophyletic. Since the defining characters of Knight's Group IV, as determined in the present study, are the same as those of the *pulchellus* group, it is more reasonable to treat the two groups as one monophyletic assemblage recognized by the characters given in the previous diagnosis. Only the western species are treated in

the present study. The eastern taxa have been keyed and illustrated by Knight (1941). They, like western species, are primarily inhabitants of deciduous trees (e.g., *Betula*, *Carya*, *Quercus*).

The broadly attached, coarsely serrate sclerotized process of the vesica, tiny tubercles on the primary membranous sac of the vesica, structure of the genital parameres, and prominent tubercles above the paramere bases suggest a relationship between *pulchellus* group species and members of the *junceus*, *listi*, and *plenus* groups. The genitalic structures of *interspersus* and *stellatus* group species also are similar to those of *pulchellus* species, except the sclerotized process of the vesica usually has fewer serrations and a much weaker medial ridge, and the genital capsule is usually without tubercles above the paramere bases.

KEY TO SPECIES OF
THE *PULCHELLUS* GROUP

- 1 Clavus mottled with red or reddish orange; pronotal disk with four reddish orange vittae on pale yellow background; male genitalia as in figure 190 *rubrocuneatus* n. sp.
- Clavus without red markings; pronotal disk sometimes deep rosy red or reddish brown, but without distinct reddish vittae on pale background 2
- 2(1) Pronotal disk deep ruby red or uniformly brown to dark yellowish brown, sometimes lightly tinged with red; clavus and corium pale greenish yellow, sometimes with faint reddish tinge; paracuneus mostly red 3

Pronotal disk pale brownish yellow with brown to fuscous markings, posterior submargin with fuscous band, sometimes breaking into distinct spots; clavus and corium grayish yellow, lightly to moderately mottled or flecked with brown or dark brown, sometimes also lightly tinged or marked with red; paracuneus pale with brown or sometimes red markings ... 4

- 3(2) Pronotal disk deep ruby red, narrowly pale between calli, posterior submargin with four broadly tumid points; antennal segment I uniform in thickness; sclerotized process of vesica without marginal serrations (fig. 191e) ... *rubroornatus* Knight

Pronotal disk brown or dark yellowish brown, sometimes lightly tinged with red, posterior submargin without tumid points; antennal segment I slightly narrower medially; sclerotized process of vesica with six or seven broad, marginal serrations (fig. 188e) ... *pulchellus* Knight

- 4(2) Clavus and corium usually with distinct flecks or small spots of brown to fuscous; sclerotized process of vesica broader apically, with 12–14 marginal serrations (fig. 187e); parameres as in figure 187b–d; body length 5.20–6.40 ... *olseni* Knight
- Clavus and corium variously marked with red, reddish brown, or brown, but usually lacking smaller flecks or spots of brown to fuscous; sclerotized process of vesica broader basally, with nine or ten marginal serrations (fig. 189e); parameres as in figure 189b–d; body length 4.25–5.25 ... *quercicola* Knight

Phytocoris olseni Knight

Figures 185–187

Phytocoris olseni Knight, 1923: 647, 648, fig. 142.
– Blatchley, 1926: 727, 728. – Knight, 1941: 205, fig. 179. – Carvalho, 1959: 209.

TYPES: Described from nine specimens collected in New Jersey and New York. The male holotype, allotype, and three paratypes were taken at Lakehurst, Ocean Co., New Jersey, 4 July 1909, C. E. Olsen. All type material is retained in the Knight Collection (USNM).

DIAGNOSIS: Length 5.2–6.4. Recognized by the yellowish brown general coloration, pronotum and hemelytra usually with numerous small flecks or spots of brown to fuscous, cuneus moderately to extensively reddened; posterior submargin of pronotal disk

with fuscous band, sometimes breaking into distinct spots; paracuneus with brown and/or red markings, rarely extensively reddened; and structure of the male genitalia, particularly the shape of the parameres (fig. 187b–d) and distally broadened sclerotized process of vesica, with 12–14 marginal serrations (fig. 187e).

DISCUSSION: *Phytocoris olseni* is widely distributed in the coastal eastern United States. Knight (1941) reported *olseni* from Florida, Mississippi, New Jersey, New York, and Virginia. In the western United States, this species has been collected in Colorado, New Mexico, and western Texas where it appears to be an inhabitant of oak (taken on *Q. gambelii* Nutt. in Colorado and *Quercus* sp. in Texas). I have examined 21 specimens from the following localities: COLORADO. **Garfield Co.:** Glenwood Spgs. (KU). **Jefferson Co.:** Deer Crk. Cyn. (JTP). **Montezuma Co.:** Dolores (USNM); Mesa Verde Nat. Pk. (USNM). **Montrose Co.:** 18 mi SE Naturita (JTP). NEW MEXICO. **Colfax Co. (KU).** **Lincoln Co.:** Ruidoso (KU). **Sandoval Co.:** Jemez Spgs. (AMNH, USNM). **Santa Fe Co.:** Tesuque (USNM). TEXAS. **Brewster Co.:** Pine Cyn., Big Bend Nat. Pk. (JTP). **Culbertson Co.:** N of Guadalupe Mts. Nat. Pk., 1660 m (AMNH). **Jeff Davis Co.:** Fort Davis St. Pk., 1585 m (TA&M). **Presidio Co.:** Shafter (TA&M). Collection dates are from April 28 to September 15.

Specimens examined from western states differ from East Coast specimens in the following genitalic characters: sensory lobe of left paramere slightly less developed; right paramere with weaker basodorsal spine and larger, noticeably rounded protuberance on outer surface of shaft near apex; sclerotized process of vesica with 12 marginal serrations (13 or 14 serrations in eastern specimens); right (anteriormost) membranous sac of vesica extending well above apex of sclerotized process (not or only slightly surpassing process in eastern specimens); partially sclerotized medial (posteriormost) sac of vesica without tubercles apically (with pointed tubercles in East Coast specimens); and left membranous sac of vesica much smaller in western specimens. Although the specimens examined from Colorado, New Mexico, and Texas may represent a distinct species, they

are treated here as conspecific with the type of *olseni* until more eastern material is available for study.

Phytocoris pulchellus Knight

Figure 188

Phytocoris pulchellus Knight, 1934: 15, 16. – Carvalho, 1959: 213. – Knight, 1968: 225.

TYPES: Described from nine specimens collected in the Santa Rita Mts. and at Tucson, Arizona. The male holotype was taken in the Santa Rita Mts., 1372 m, 9 September 1925, A. A. Nichol. The holotype, allotype, and four paratypes are retained in the Knight Collection (USNM); three paratypes were not located.

DIAGNOSIS: Length 4.5–5.0. Similar to *rubroornatus* but distinguished by the brown or dark yellowish brown coloration of the pronotal disk, sometimes lightly tinged with red; lighter, often less extensive, red markings on the cuneus and paracuneus; absence of tumid points on posterior submargin of pronotal disk; antennal segment I narrower medially than at ends; and by the structure of the male genitalia, most notably the sclerotized process of vesica with six or seven broad marginal serrations (fig. 188e).

DISCUSSION: *Phytocoris pulchellus* is distributed in southeastern Arizona where it has been collected from *Quercus oblongifolia* Torr. I have examined 21 specimens from the following localities: **ARIZONA. Cochise Co.:** Ft. Huachuca (CAS). **Pima Co.:** Mt. Lemmon Rd., 1435 m (AMNH); Sabino Basin, St. Catalina Mts., 1160 m (AMNH, KU); Santa Rita Mts. (KU, USNM). **Santa Cruz Co.:** Ruby (KU); Santa Cruz R. (USNM). Collection dates are from April 19 to September 9. Several specimens were collected at mercury vapor light.

Phytocoris quercicola Knight

Figure 189

Phytocoris quercicola Knight, 1920: 60, 61, pl. I, fig. 24; 1923: 645, 646, fig. 149. – Blatchley, 1926: 725, 726, pl. XI, fig. 24. – Knight, 1941: 202, 203, fig. 179. – Froeschner, 1949: 184. – Carvalho, 1959: 213.

TYPES: Described from at least 55 specimens (exact number uncertain) collected in

Maryland, Massachusetts, New York, and Virginia. The male holotype, allotype, and 52 paratypes were taken at Batavia, Genesee Co., New York, 1–15 August 1916, H. H. Knight. All type material is retained in the Knight Collection (USNM).

DIAGNOSIS: Very similar to *olseni* but distinguished by the smaller size, length 4.25–5.25; clavus and corium with brown, reddish brown, or sometimes red markings, but usually without scattered small flecks or spots of brown to fuscous; and the structure of the male genitalia, particularly the shape of the parameres (fig. 189b–d) and sclerotized process of vesica broadest basally, with nine or ten marginal serrations (fig. 189e).

DISCUSSION: *Phytocoris quercicola* is widely distributed in the eastern United States where it occurs on *Quercus macrocarpa* Michx. Knight (1941) reported this species from Florida, Illinois, Iowa, Maryland, Massachusetts, Minnesota, New York, North Carolina, Ontario, and Virginia. In the western United States specimens have been collected in central and southeastern Arizona and western Texas. A moderate series of specimens was taken south of Globe on Pioneer Pass Rd, 1435 m, Gila Co., Arizona, 30–31 May 1983, on *Quercus turbinella* Greene (AMNH). Several males were collected at light in Texas. I have examined several dozen specimens from Arizona and Texas with collection dates from May 15 to November 23. Arizona specimens tend to have fewer dark markings on the hemelytra than Texas specimens—the markings often reddish brown rather than fuscous. Also, the corium of Arizona specimens is frequently tinged with red, especially distally.

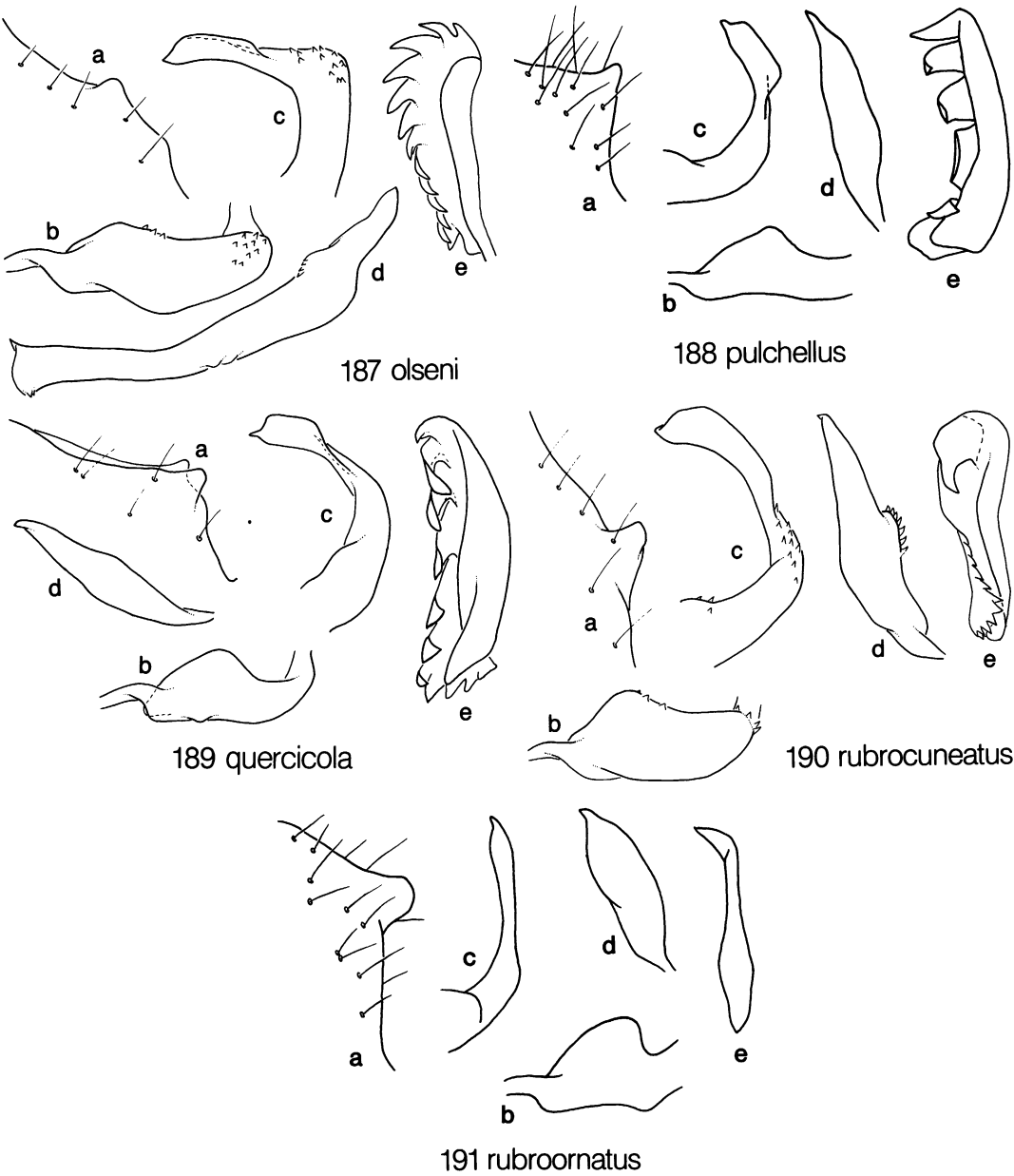
Phytocoris rubrocuneatus, new species

Figure 190

HOLOTYPE MALE: Guadalupe Cyn., 4200 ft (1280 m), Cochise Co., Arizona, 7 August 1967, V. D. Roth (AMNH).

PARATYPES: **ARIZONA. Cochise Co.:** 1 male, SW Rsrh. Stn., Portal, 1645 m, 2 August 1955, R. R. Dreisbach (USNM); 1 female, SW Rsrh. Stn., 5 mi W Portal, 9 August 1973, taken at light, J. D. Pinto (UCR). **Santa Cruz Co.:** 1 female, Patagonia, 22 August 1935, taken on sycamore, R. H. Beamer (KU).

DIAGNOSIS: Distinguished from other



Figs. 187–191. Male genitalia of *pulchellus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

species of the *pulchellus* group by the four reddish orange vittae on the otherwise pale yellow pronotal disk; clavus and sometimes inner basal half of corium mottled with red or reddish orange; and structure of the male genitalia, especially the form of the para-

meres (fig. 190b–d) and sclerotized process of the vesica (fig. 190e).

DESCRIPTION: *Male.* Length 5.30, width 1.68 (holotype); pale greenish yellow general coloration with red markings. **Head:** width across eyes 0.90–0.95, vertex 0.32; white or

pale yellow; frons and sometimes tylus marked with reddish orange. **Rostrum:** length 2.18–2.20, reaching fifth or sixth abdominal segment. **Antennae:** uniformly pale yellow; length of segment I, 1.23–1.25; II, 2.42–2.50; III, 1.40–1.42; IV, 1.24–1.27. **Pronotum:** mesal length 0.76–0.79, posterior width 1.34; disk pale yellow with four broad reddish orange vittae across middle; collar marked with reddish orange dorsolaterally, pale medially; propleura pale, anterodorsal angle tinged with orange. **Scutellum:** pale yellow with reddish orange maculae mediolaterally, sometimes also marked with red anteromedially; markings comprise coalesced smaller spots. **Hemelytra:** pale yellow with faint greenish tinge especially on corium; clavus and inner basal half of corium moderately to extensively mottled with reddish orange; cuneus mostly rosy red, apex and one or two spots on outer margin pale greenish yellow; paracuneus with dark, setiferous spot. **Legs:** femora pale yellow, sometimes brownish yellow distally; apical third of hind femora with limited reddish maculae; tibiae pale yellow, hind pair with strongly contrasting black spines. **Vestiture:** dorsum with pale simple setae and fine sericeous setae. **Genitalia:** Figure 190.

Female. Similar to male in color, vestiture, and structure. Length 5.65–5.85, width 1.80–1.82. **Head:** width across eyes 0.94, vertex 0.38–0.40. **Rostrum:** length 2.21–2.41, reaching fourth or fifth abdominal segment. **Antennae:** I, 1.29–1.41; II, 2.65; III, 1.54–1.65; IV, 1.28–1.34. **Pronotum:** mesal length 0.78–0.84, posterior width 1.40–1.42.

ETYMOLOGY: From the Latin, *rubra* (red) and *cuneatus* (wedge-shaped), referring to the brilliant red cuneus of the species.

DISCUSSION: *Phytocoris rubrocuneatus* is known only from the type material collected in southeastern Arizona. The female paratype from Patagonia was collected on Ari-

zona Sycamore, *Platanus wrightii* S. Wats., which is probably the host plant of the species.

Phytocoris rubroornatus Knight

Figure 191

Phytocoris rubroornatus Knight, 1961: 482; 1968: 216.

TYPES: Described from a single female (incorrectly listed as a male in original description) taken at Williams, Coconino Co., Arizona, 15 August 1930, E. D. Ball. This specimen is deposited in the Knight Collection (USNM).

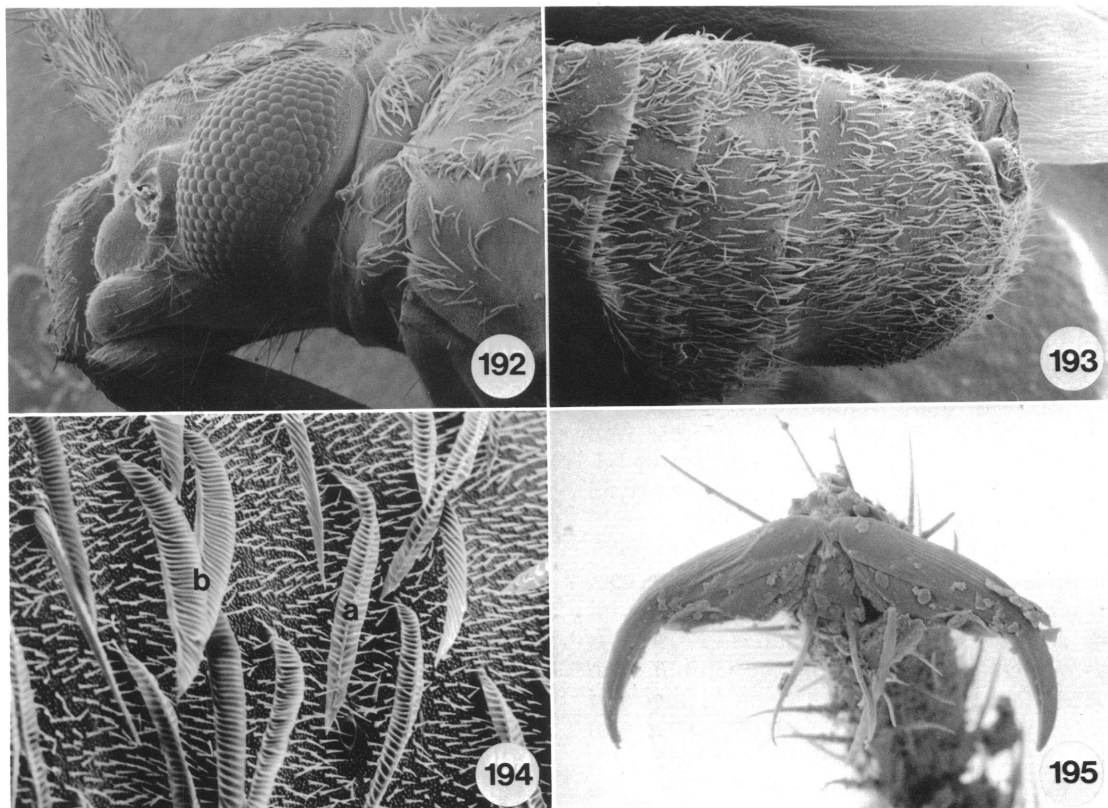
DIAGNOSIS: Length 4.8–5.8. Recognized by the deep ruby red coloration of the cuneus, paracuneus, and pronotal disk; pale greenish yellow clavus and corium, without red or brown markings; uniform thickness of antennal segment I; broadly tumid points on posterior submargin of pronotal disk; prominent tylus; frons strongly convex anteriorly of antennal fossae, meeting tylus along deep depression; and by the structure of the male genitalia, especially the nonserrate sclerotized process of the vesica (fig. 191e).

DISCUSSION: *Phytocoris rubroornatus* has been collected in Arizona and southeastern Utah. Adults and nymphs have been collected on *Berberis fremontii* Torr. and *B. haematocarpa* Wooton. I have examined 142 specimens from the following localities: **ARIZONA. Cochise Co.:** Chiricahua Mts. (USNM). **Coconino Co.:** Williams (USNM). **Gila Co.:** Pinal Mts. (USNM); 6 mi S Jct. Rt. 188 on Rt. 87, 1005 m (AMNH); Jones Cmpgd., 17 mi N Globe, 1310 m (AMNH). **Maricopa Co.:** Sunflower (JTP). **Navajo Co.:** 15–20 mi SW Show Low, 1585–1830 m (AMNH). **Yavapai Co.:** 1 mi N Int. 17 on Rt. 179, 1160 m (AMNH); 4 mi S Sedona, 2000 m (AMNH); 22.7 mi S Ash Fork on Rt. 89 (AMNH). Collection dates are from May 29 to August 15.

PULCHRICOLLIS SPECIES-GROUP

DIAGNOSIS: Recognized by the small size; structure of the head, especially the strongly produced tylus base and broad vertex (fig. 192)—length of eye in lateral view less than width of vertex; abdominal sternites with dense mat of appressed, pale, sericeous or

narrow scalelike setae (fig. 193), segments 2–7 with distinct longitudinal sulcus medially; and metatarsus with length of segment I equal to or greater than length of segment II. *Pulchricollis* group species share many of the above characters with members of the *can-*



Figs. 192–195. *Phytocoris pulchricollis*. 192. Lateral view of head. 193. Lateral view of abdomen. 194. Dorsal vestiture: a, white scalelike setae; b, black scalelike setae. 195. Pretarsus.

didus group but are distinguished by the narrower setae covering the venter, and structure of the male genitalia, especially the well-developed tubercle above the base of the left paramere.

DESCRIPTION: Small, 4.0–5.1, ovate, pale species with reddish brown to fuscous markings; vestiture of dorsum with suberect, simple setae and narrow, white or golden, scalelike setae, sometimes also with dark scalelike setae; venter moderately to densely clothed with appressed, white or golden, sericeous or scalelike setae. **Head:** antennae yellowish brown to fuscous; segment I with pale spots on dorsal aspect; segment II, sometimes with pale, median annulus and two or three pale spots dorsally on darkened basal region; frons prominent, deflexed apically, meeting tylus along deep depression; tylus strongly produced at base; eyes elliptical to slightly reniform. **Pronotum:** disk uniformly pale yel-

low or extensively darkened, sometimes with pale, median stripe; posterior submargin of disk, except *torridus*, with fuscous band or series of dark patches; propleura pale, dorsal submargin sometimes with narrow, fuscous stripe. **Hemelytra:** white or pale yellow ground color with brownish red to fuscous markings mostly along veins, inner margins of corium and cuneus, outer apical angle of corium, and at apices of clavus and cuneus (clavus and corium of *torridus* nearly uniform brownish yellow, sometimes with faint pinkish tinge); membrane conspurcate, spots coalescing apically. **Legs:** femora white or pale yellow with red to fuscous markings, distal third sometimes extensively darkened; tibiae pale with reddish brown or fuscous markings, front pair with three or four dark annuli. **Male genitalia:** genital capsule with cylindrical, posteriorly directed tubercle above base of left paramere. *Left paramere:* sensory lobe

prominent; shaft laterally flattened, dorso-distal margin strongly reflexed, noticeably expanded in dorsal view. *Right paramere*: broadly lanceolate, apex acute. *Vesica*: primary membranous sac reduced, with two or three indistinct lobes; basal lobes small; two sclerotized processes; right process ladle-shaped, often positioned ventral of left (dorsal) process in unexpanded vesica, attached to membranous sac only along curved basal margin, cuplike basal region broadly opened, distal handlelike portion flattened; left process straplike, broadly attached along inner margin to primary membranous sac and extending beyond its apex, basal process well sclerotized, expanded apically, extending beyond level of gonopore, apex well removed from bases of sclerotized processes.

DISCUSSION: Members of the *pulchricollis* group are widely distributed in the American Desert and Mexican Highland provinces of the southwestern United States. *Phytocoris albidopictus* also occurs in the Chihuahuan Desert Province of southern New Mexico and western Texas. The host plant associations of these species are not well documented, with the exception of *torridus* which appears to breed on *Larrea divaricata* Cav. Host records for other *pulchricollis* group species include a varied of shrubby and herbaceous plants, but for the most part come from single specimens.

KEY TO SPECIES OF
THE *PULCHRICOLLIS* GROUP

- 1 Dorsal vestiture with narrow scalelike, dark brown or black setae; pronotal disk, at least an anterior lobe with pale median line or stripe; scutellum extensively darkened with brown or fuscous 2
- Dorsal vestiture with golden and/or silvery white scalelike setae, but lacking dark scalelike setae; pronotal disk without pale median line; scutellum mostly pale, sometimes with limited red or reddish brown markings 3
- 2(1) Pronotal disk almost entirely darkened, with only posterior margin and narrow stripe between calli pale, the stripe confined to anterior two-thirds of disk, not reaching pale posterior margin; ratio of length of antennal segment I to width of head across eyes from 0.90:1 to 1.10:1 *albidopictus* Knight

- Pronotal disk usually less extensively darkened, sometimes broadly pale either side of middle; pale median line on disk broad, extending from collar to posterior margin; ratio of length of antennal segment I to width of head across eyes from 1.20:1 to 1.60:1 *pulchricollis* Van D.
- 3(1) Brownish yellow general coloration, hemelytra with limited red or reddish brown markings mostly along embolium and on cuneus; posterior margin of pronotal disk very slightly concave medially; sensory lobe of left paramere moderately produced, distal margin gradually sloping (fig. 199b) .. *torridus* n. sp.
- Grayish white general coloration, hemelytra with apex of clavus, posterolateral angle of corium, large mark on mediolateral region of corium, and distal third of cuneus reddish brown or fuscous; posterior margin of pronotal disk strongly angular concave medially; sensory lobe of left paramere strongly produced, distal margin steeply sloping (fig. 197b) .. *imperialensis* n. sp.

Phytocoris albidopictus Knight
Figure 196

Phytocoris albidopictus Knight, 1961: 476, 478, fig. 2; 1968: 250.

TYPES: *Phytocoris albidopictus* was described from 12 specimens collected in Arizona, California, New Mexico, and Texas. The male holotype was taken in the Rincon Mts., 1006 m, Pima Co., Arizona, 2 September 1928, A. A. Nichol. The holotype, allotype, and seven paratypes are deposited in the Knight Collection (USNM); three paratypes were not located.

DIAGNOSIS: Length 4.0–5.0. Recognized by the extensively darkened pronotal disk, usually with only posterior margin and narrow longitudinal stripe between calli pale; mixed dorsal vestiture, including narrow scalelike, dark brown or black setae; and by the short, thick first antennal segment, ratio of segment length to width of head across eyes ranging from 0.90:1 to 1.10:1. The male genitalic structures are very similar to those of *pulchricollis*.

DISCUSSION: *Phytocoris albidopictus* is widely distributed in the southwestern United States, but is not well represented in collections. Besides type material, I have examined 15 specimens from the following localities:

ARIZONA: Cochise Co.: 6 mi N Portal (UCR). Maricopa Co.: 28 mi SE Gila Bend (CAS). Pima Co.: Ajo Mts. (USNM); Organ Pipe Nat. Mon. (CAS). Unknown Co.: Alamo (KU). CALIFORNIA. Imperial Co.: 3 mi NW Glamis (CAF&A). Riverside Co.: Palm Spgs. (LACM); Palm Cyn., 5 mi S Palm Spgs. (UCR); P. L. Boyd Desert Research Center, 3.5 mi S Palm Desert (UCR). San Diego Co.: Anza-Borrego Desert St. Pk., Borrego Palm Cyn. Cmpgd., 180 m (AMNH). NEVADA. Nye Co.: Area TM, Nevada Test Site, near Mercury (USNM). NEW MEXICO. Dona Ana Co.: Pyramid Peak (LACM). Otero Co.: 1 mi W Oliver Lee St. Pk., Sacramento Mts. (TA&M). Socorro Co.: Unspecified locality (KU). TEXAS. Brewster Co.: Big Bend Nat. Pk. (UCB); 65 mi S Marathon (KU). Presidio Co.: Presidio (TA&M). Collection dates are from April 12 to September 16. The only host plant record for this species comes from a single specimen collected near Portal, Arizona, on *Larrea*. Both males and females of *albidipictus* have been taken at light.

***Phytocoris imperialensis*, new species**

Figure 197

HOLOTYPE MALE: 3 mi NW of Glamis, Imperial Co., California, 15–16 September 1972, "blacklight trap," M. Wasbauer and A. Hardy (CAF&A; donated to the AMNH).

PARATYPES: CALIFORNIA. Imperial Co.: 2 females, same data as holotype (AMNH, CAF&A); 1 male, sand dunes east of Brawley, 13 June 1960, ex. *Eriogonum deserticola* Wats., H. C. Dickson (UCR); 2 females, 5 mi E Niland, 2 November 1973, J. D. Pinto (AMNH, UCR).

DIAGNOSIS: Recognized by the grayish white general coloration with limited brownish red to fuscous markings, scutellum uniformly pale; dorsum without black scalelike setae; posterior margin of pronotal disk strongly angular concave; and by the structure of the male genitalia, especially the small sclerotized processes of the vesica (fig. 197e, f), strongly produced sensory lobe of the left paramere (fig. 197b), and nearly uniform width of shaft of right paramere (fig. 197d).

DESCRIPTION: *Male*. Length 4.00–4.10, width 1.38–1.51; grayish white general coloration with brownish red to fuscous mark-

ings. **Head:** width across eyes 0.80–0.84, vertex 0.37–0.40; creamy white or pale yellow with red or brownish red markings mostly on frons, tylus, jugum, and around antennal fossae; vertex weakly sloping, with dark mark bordering inner posterior angle of eye; frons weakly convex, meeting tylus along broad depression, pale medially with several poorly developed reddish striae laterally; tylus prominent; eyes large, obovate, occupying slightly more than three-fourths of head height. **Rostrum:** length 1.68–1.78, reaching between hind coxae. **Antennae:** I, length 0.64–0.72, broadest before middle and tapering toward both ends, slightly flattened laterally, brownish red with pale spots and several erect bristlelike setae dorsally, dorsal surface with both dark brown and silvery white, reclined simple setae, ventral surface with silvery white setae only; II, length 1.56–1.86, brownish yellow, lightly marked with red especially on basal half, narrow annulus at base pale; III, length 0.99, brown or yellowish brown; IV, missing. **Pronotum:** mesal length 0.77–0.88, posterior width 1.31–1.51; creamy white or grayish white; collar laterally, calli, and anterolateral angles marked with reddish brown or fuscous; posterior lobe of disk lightly tinged with brown or reddish brown on darker specimens, and posterior submargin with six weakly elevated fuscous points; posterior margin of disk strongly angular concave; propleura mostly pale, anterior margin with two brownish red stripes crossing coxal cleft. **Scutellum:** weakly convex, creamy white; mesoscutum broadly exposed, with limited dark markings that sometimes extend onto anterior margin of scutellum. **Hemelytra:** creamy white or grayish white; middle of clavus and posteromedial region of corium tinged or sometimes more heavily marked with brown; apex of clavus, large mark on mediolateral region of corium, posterolateral angle of corium, and distal third of cuneus reddish brown or fuscous; membrane slightly to moderately conspurcate, especially within areolar cells, spots coalescing along outer margin of membrane forming two larger maculae. **Legs:** femora creamy white or pale yellow with red or brownish red markings mostly on distal third to one-half, hind pair more extensively reddened, marked with pale spots distally; tibiae pale with red markings, front pair with four

well defined annuli, bands less distinct on other tibiae; tarsi brownish yellow. **Vestiture:** dorsum with pale simple setae and densely distributed, narrow, silvery white, scalelike setae; dark regions on pronotum and hemelytra also with dark simple setae, and sometimes narrow, dark brown or black, scalelike setae. **Genitalia:** Figure 197.

Female. Similar to male in color, vestiture, and structure. Length 4.42–4.70, width 1.51–1.82. **Head:** width across eyes 0.84–0.88, vertex 0.41–0.43. **Rostrum:** length 1.85–1.90, reaching between hind coxae or slightly beyond. **Antennae:** I, 0.79–0.90; II, 1.89–2.12; III, 1.00–1.12; IV, 0.68–0.84. **Pronotum:** mesal length 0.78–0.89, posterior width 1.35–1.58.

ETYMOLOGY: Named for Imperial County in California.

DISCUSSION: This species is known only from Imperial County, California. Collection dates are in June, and September to November, suggesting a life history with two generations per season. A single example of *imperialensis* has been collected on *Eriogonum deserticola*; the male holotype was taken at UV light.

Phytocoris pulchricollis Van Duzee

Figures 192–195, 198

Phytocoris pulchricollis Van Duzee, 1923: 148, 149.
– Carvalho, 1959: 213. – Knight, 1968: 255.

TYPES: Described from five specimens collected on Carmen Is. and San Marcos Is. in the Gulf of California. The male holotype (no. 1011) was taken on San Marcos Is., 19 June 1921 and the allotype (no. 1012) at Puerto Ballandra, Carmen Is., 22 May 1921. All type material is retained in the Van Duzee Collection (CAS).

DIAGNOSIS: Length 4.0–5.0. This species closely resembles *albidopictus* but differs by the longer first antennal segment (ratio of segment length to width of head across eyes from 1.20:1 to 1.60:1), and pronotum usually less extensively darkened, with broad median line extending to posterior margin of disk. The male genitalic structures of these two species are very similar. *Phytocoris pulchricollis* is easily distinguished from *imperialensis* and *torridus* by the narrow scalelike dark setae on the dorsum; pale median line on the pronotal

disk; and by the extensively darkened scutellum.

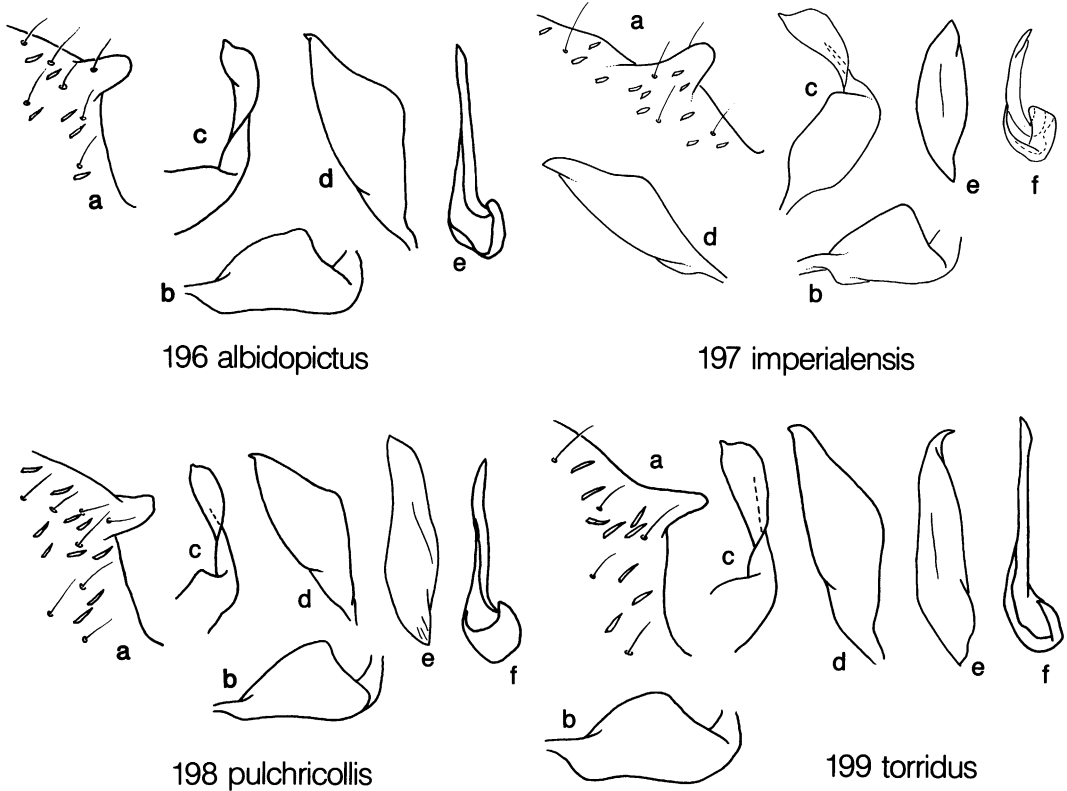
DISCUSSION: *Phytocoris pulchricollis* is widely distributed in the American Desert province of the southwestern United States. Specimens have been collected as far north as Mono Co., California and Lyon Co., Nevada; east to Washington Co., Utah and the Santa Catalina Mts. in Arizona; and south to the U.S.-Mexico border. The southern mountain ranges form the western boundary of the distribution in California. This species also occurs in northern Mexico and throughout much of Baja California. I have examined 120 specimens, mostly taken at light. A single specimen each was collected from *Dalea fremontii* Torr., *Eriogonum fasciculatum* Benth., *Prosopis* sp., *Purshia tridentata* (Pursh) DC., and *Oenothera* sp.; several examples each were taken on *Ambrosia* sp. and *Hyptis* sp. Collection dates are from April 22 to October 28.

Phytocoris torridus, new species

Figure 199

HOLOTYPE MALE: 5.4 mi of NW Ocotillo on Rt. S2, Imperial Co., California, 23 April 1980, ex. *Larrea divaricata* Cav., M. D. Schwartz and L. Russell (AMNH).

PARATYPES: ARIZONA. **Maricopa Co.:** 1 male, Sierra Estrella, 24 April 1983, J. T. and D. A. Polhemus (JTP). **Pinal Co.:** 1 male, 4 mi SE Casa Grande, 18 June 1964, taken at black light, D. R. Smith and C. W. Baker (OSU). **Yuma Co.:** 1 female [unspecified locality], 27 April 1939, "at light traps," L. L. Stitt (USNM). CALIFORNIA. **Kern Co.:** 1 female, Mojave, 6 June 1930, R. L. Usinger (UCB); 1 female, Mojave, 30 July 1912, E. D. Ball (USNM). **Imperial Co.:** 1 female, 1 mi E Coyote Wells, 23 April 1980, M. D. Schwartz and L. Russell (AMNH); 1 male, 2 females, Glamis, 29 May 1971, taken in pit trap, M. S. Wasbauer (CAF&A); 1 male, 7 mi W Glamis, 16 March 1976, ex. *Larrea divaricata*, J. D. Pinto (UCR); 2 males, E of Holtville, 1 June 1935, Oman (USNM); 1 male, Seely, 15 April 1970, ex. *Dalea spinosa* Gray., F. L. Blanc (CAF&A). **Inyo Co.:** 7 males, 13 females, Little Lk., 6–8 June 1929, ex. *Larrea divaricata* (as *L. mexicana*) in part, R. L. Usinger or E. P. Van Duzee (CAS); 3



Figs. 196–199. Male genitalia of *pulchricollis* group species. **196.** a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Right sclerotized process of vesica (left sclerotized process teneral). **197–199.** a–d as in fig. 196. e. Left sclerotized process of vesica. f. Right sclerotized process of vesica.

males, 1 female, site 15, NW end Saline Valley sand dunes, 366 m, 6 June 1976, D. Giuliani (CAF&A, LACM, OSU); 2 males, 1 female, Stove Pipe Wells, Death Valley Nat. Mon., 11 April 1949, W. D. Pierce (LACM); 2 females, 7 mi NE Panamint Spgs., 16 May 1969, taken at black light, P. Rude and J. Doyen (UCB). **Riverside Co.:** 1 female, Deep Cyn., 13 June 1963, taken at light, E. I. Schlinger (UCR); 2 females, Hopkins Well, 16 April 1958, J. Powell (UCB); 2 females, 20 mi S Indio, 24 April 1973, P. Oman (OSU). **San Bernardino Co.:** 2 males, Vidal, 27 April 1948, R. Coleman (USNM). **San Diego Co.:** 2 females, Borrego, 24 April 1949, taken at light, L. W. Quate (UCB); 1 male, 2 females, Borrego, 23 April 1955, R. O. Schuster (AMNH, UCB); 1 female, Borrego, 3 May 1956, J. Powell (UCB); 1 male, 5 mi E Ocotillo Wells, 7 April 1981, ex. *Atriplex* sp., D.

A. Polhemus (JTP). **Unknown Co.:** 1 male, Raven, 30 July 1912, E. D. Ball (USNM). **NEVADA.** **Nye Co.:** 1 female, Big Dune, S of Beatty, 19–20 September 1974, Doyen (UCB).

DIAGNOSIS: Distinguished from other species of the *pulchricollis* group by the brownish yellow general coloration, sometimes with limited red or reddish brown markings; dorsum without dark brown or black scalelike setae; scutellum mostly pale, not extensively darkened with fuscous as in *albidopictus* and *pulchricollis*; and by the structure of the male genitalia, especially the less abruptly produced sensory lobe of the left paramere (fig. 199b), and the broadly expanded distal region of the shaft (fig. 199c).

DESCRIPTION: *Male.* Length 4.42–4.86, width 1.58–1.74; pale brownish yellow or yellowish brown general coloration, dorsal sur-

face sometimes lightly marked with red or reddish brown. **Head:** width across eyes 0.84–0.86, vertex 0.39–0.41; pale yellow, lightly to moderately marked or tinged with red or reddish brown; frons weakly convex, meeting tylus along deep depression; frons of darker specimens with pale median line bordered by reddish striae; tylus strongly produced at base. **Rostrum:** length 2.21–2.36, reaching fourth or fifth abdominal segment. **Antennae:** yellowish brown, segments I and II usually marked with red or reddish brown, especially on darker specimens, segments III and IV sometimes darker brown; I, length 0.68–0.76; II, length 1.58–1.66; III, length 0.93–1.13; IV, length 0.72–0.97. **Pronotum:** mesal length 0.84–0.92, posterior width 1.45–1.60; disk pale yellow or brownish yellow; collar and calli usually marked or tinged with red or reddish brown; propleura pale, lightly marked with red on darker specimens. **Scutellum:** yellow or pale brownish yellow; weakly convex. **Hemelytra:** brownish yellow, sometimes with pinkish tinge, lightly marked with red or reddish brown on darker specimens, particularly along embolium and on cuneus; membrane lightly to moderately mottled with fuscous, outer margin with two pale spots. **Legs:** femora yellow or pale brownish yellow with red or reddish brown markings, hind pair usually

more extensively darkened on apical half and marked with pale spots; tibiae pale with red or reddish brown markings, front pair with four dark annuli including narrow band at base. **Vestiture:** dorsum with golden simple setae, and narrow scalelike setae that are either golden or silvery white; darker specimens sometimes with scattered brown setae on pronotum. **Genitalia:** Figure 199.

Female. Similar to male in color, vestiture, and structure. Length 4.75–5.08, width 1.67–1.85. **Head:** width across eyes 0.84–0.87, vertex 0.41–0.44. **Rostrum:** length 2.32–2.46, reaching sixth or seventh abdominal segment. **Antennae:** I, 0.76–0.90; II, 1.73–2.05; III, 1.12–1.30; IV, 0.72–0.79. **Pronotum:** mesal length 0.81–0.88, posterior width 1.44–1.55.

ETYMOLOGY: From the Latin, *torridus* (dry or parched), referring to the arid habitat of this species.

DISCUSSION: *Phytocoris torridus* is distributed in the Mojave and Sonoran deserts. Specimens have been taken as far north as Inyo Co., California and east to Maricopa and Pinal counties, Arizona. Adults have been collected on *Atriplex* sp., *Dalea spinosa*, and *Larrea divaricata*. Males and females of this species are attracted to light. Collection dates are from March 16 to September 20.

ROSEIPENNIS SPECIES-GROUP

DIAGNOSIS: Recognized by the large, elongate body form of the male; strongly brachypterous female; pale general coloration; dorsal vestiture mostly pale, without scalelike setae (fig. 201); elongate head with prominent frons and tylus, broadly developed gular region, small eyes, and broad vertex (fig. 200); unbanded tibiae; and structure of the male genitalia, especially the vesica with slightly reduced primary membranous sac and one or two large sclerotized processes with strongly reflexed margins.

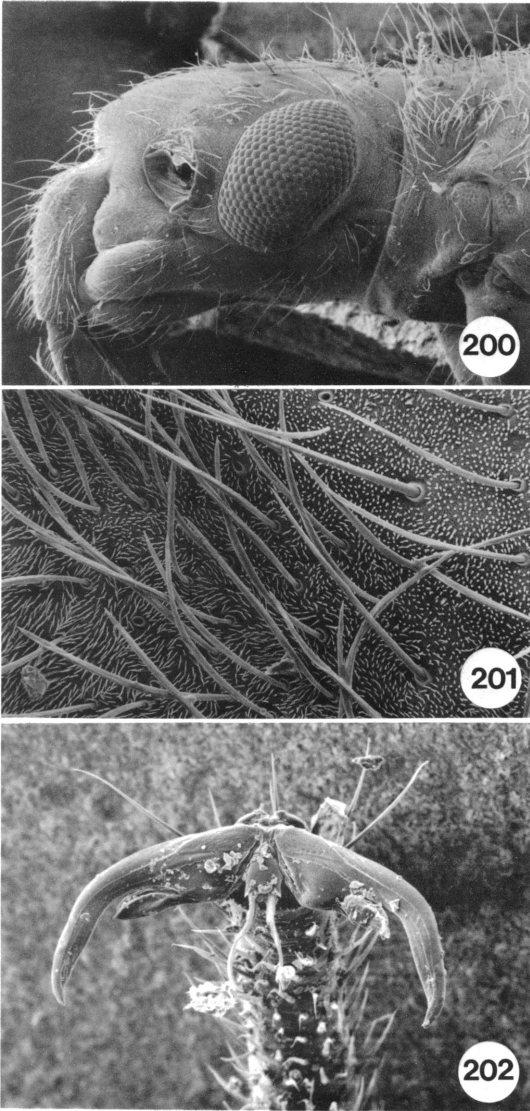
DESCRIPTION: Moderate to large, 5.3–9.2, pale species with limited red or brown markings; females strongly brachypterous with membrane of fore wing greatly reduced; vestiture of dorsum with narrow, silvery white, sericeous setae and short, golden to dark brown, simple setae, or sometimes with long, pale, simple setae. **Head:** elongate with prom-

inent frons and tylus, and broad gula and vertex; antennae pale yellow to yellowish brown; segment I slightly thicker basally with sparsely distributed, erect, pale setae, sometimes marked with brown or reddish brown; frons strongly deflexed apically, meeting tylus along deep depression; base of tylus strongly produced; eyes elliptical to slightly reniform, length in lateral view less than or equal to width of vertex. **Pronotum:** disk yellow or brownish yellow with limited red or brown markings, sometimes with pale longitudinal lines; propleura uniformly pale or lightly marked with reddish brown to fuscous. **Hemelytra:** yellow or grayish yellow, sometimes lightly to moderately tinged or flecked with brown to fuscous, especially in darker specimens of *fuscipennis* and *planituberis*; clavus and corium of *roseipennis* with limited to extensive red or reddish brown suffusion, some-

times forming distinct longitudinal bands; membrane lightly infuscated, sometimes with darker dusky flecks. **Legs:** femora white or pale yellow, usually with limited red to fuscous markings; hind femora often more extensively darkened and marked with pale spots; tibiae pale, sometimes with dark markings but never distinctly annulated. **Male genitalia:** genital capsule, except *fuscipennis*, with well-developed tubercle above base of left paramere. *Left paramere:* sensory lobe weakly to moderately produced; shaft short, slightly expanded distally in dorsal view; apex narrowly flattened, truncate. *Right paramere:* elongate to narrowly lanceolate; dorsal surface sometimes arcuate; apex acute or narrowly rounded. *Vesica:* primary membranous sac slightly to moderately reduced, multilobed, sometimes partially sclerotized basally or near apices of lobes; basal lobes weakly to strongly developed, outer surface sometimes sclerotized in part; basal process, except *roseipennis*, small and weakly sclerotized; one or two sclerotized processes; right process elongate, weakly to moderately curved with strongly reflexed margins and deep medial trough, narrowly attached basally to primary membranous sac; left process, when present, smaller than right process and more broadly attached along inner margin to membranous sac, shape variable.

DISCUSSION: The *roseipennis* group comprises four species, three of which are known only from the Mexican Highland Shrub Steppe province of southeastern Arizona. The other species, *validus*, is distributed in the Great Plains Shortgrass Prairie and Rocky Mountain Forest provinces of Colorado, Montana, South Dakota, and Wyoming. The latter species also is reported from eastern Alberta, Saskatchewan, and Manitoba (Kelton, 1980). *Phytocoris fuscipennis* and *roseipennis* have been collected on native grasses in Arizona. Kelton (1980) lists “herbaceous plants” as the habitat of *validus* in Canada. The host plant association of *planituberis* is not known.

Regarding head morphology and the structure of the male genitalia, *roseipennis* group species are perhaps most similar to members of the *hopi* group and to some extent the *rostratus* group. However, other features of the external morphology such as general color-



Figs. 200–202. *Phytocoris roseipennis*. 200. Lateral view of head. 201. Sericeous setae of dorsal vestiture. 202. Pretarsus.

ation, vestiture, and the large, elongate body form of the male suggest a relationship with the *cunealis* and *lasiomerus* groups.

KEY TO SPECIES OF
THE *ROSEIPENNIS* GROUP

- 1 Pronotal disk with short, dark, simple setae 2
- Pronotal disk with long, pale, simple setae 3

- 2(1) Ratio of length of antennal segment I to width of head across eyes from 1.15:1 to 1.25:1 for males; left genital tubercle small (fig. 206a) *validus* Reuter
 Ratio of length of antennal segment I to width of head across eyes from 1.30:1 to 1.50:1 for males; left genital tubercle large, laterally flattened (fig. 204a)
 *planituberis* n. sp.
- 3(1) Hemelytra tinged or marked with red; ratio of length of antennal segment I to posterior width of pronotum from 0.90:1 to 1.10:1 for males; genital capsule with small tubercle above base of left paramere (fig. 205a) *roseipennis* Knight
 Hemelytra without red markings; ratio of length of antennal segment I to posterior width of pronotum from 0.65:1 to 0.85:1 for males; genital capsule without tubercle above base of left paramere (fig. 203a) ..
 *fuscipennis* Knight

Phytocoris fuscipennis Knight

Figure 203

Phytocoris fuscipennis Knight, 1934: 5. – Carvalho, 1959: 200. – Knight, 1968: 216.

Phytocoris longirostris Knight, 1934: 6. – Carvalho, 1959: 205. – Knight, 1968: 216. NEW SYNONYMY.

TYPES: *Phytocoris fuscipennis* was described from 28 males collected in Cochise Co., Arizona. The holotype and 26 paratypes were taken in Texas Cyn., Chiricahua Mts., 1737 m, 16 and 23 September 1927, in light trap, J. A. Kusche. All type material is retained in the collection of the CAS except seven paratypes deposited in the Knight Collection (USNM) and five paratypes that were not located.

The junior synonym, *longirostris*, was described from five specimens collected in Cochise and Pima counties, Arizona. The male holotype, allotype, and two paratypes were taken at Tucson, Pima Co., 19 September 1928, A. A. Nichol. The holotype, allotype, and one paratype are retained in the Knight Collection (USNM); two paratypes were not located.

DIAGNOSIS: Length: male 7.0–9.2, female 6.0–6.3. Similar to *roseipennis* but distinguished by the shorter first antennal segment, hemelytra without red markings, and structure of the male genitalia: genital capsule without tubercle above base of left paramere

(fig. 203a); right paramere unmodified dorsally (fig. 203d), without protuberance as seen in *roseipennis*; and vesica with two sclerotized processes (fig. 203e, f). The ratio of length of antennal segment I to posterior width of pronotum is from 0.65:1 to 0.85:1 for males.

DISCUSSION: I have examined 98 specimens of *fuscipennis* from Cochise and Pima counties, Arizona; Hidalgo and Luna counties, New Mexico; and Presidio Co., Texas. The majority of these specimens were males taken at light. Collection dates are from August 12 to September 30. The habitat of this species is uncertain. Knight (1934) states that the holotype, allotype, and two paratypes of *longirostris* were collected on the "same grasses described for *roseipennis*" (see *roseipennis* discussion section).

Phytocoris longirostris is placed in synonymy with *fuscipennis* on the basis of the nearly identical genitalic structures of the males. I have not seen the differences in the right paramere discussed by Knight (1934). The body size and general coloration of *fuscipennis* is quite variable, ranging from small, almost uniformly pale yellow specimens to large individuals that are extensively darkened with fuscous. Knight (1934) considered individuals from the opposite extremes of this continuum to represent two different species, *longirostris* (small, pale) and *fuscipennis* (large, dark). I find no basis for such a distinction given the identical genitalic structures of the males and lack of any discernible discontinuity in the variation of size and coloration.

Phytocoris planituberis, new species

Figure 204

HOLOTYPE MALE: Texas Cyn., Chiricahua Mts., 1524–1829 m, Cochise Co., Arizona, 16 September 1927, J. A. Kusche (CAS).

PARATYPES:: ARIZONA. Cochise Co.: 2 males, same data as holotype (CAS); 23 males, Texas Cyn., Chiricahua Mts., 1737 m, 23 September 1927, J. A. Kusche (AMNH, CAS, OSU, USNM); 1 male, Cave Crk., Chiricahua Mts., 1646 m, 10 September 1958, taken at light, Timberlake (UCR); 1 male, 8 mi SW Apache, 12 August 1973, J. D. Pinto (UCR); 2 males, Douglas, 6 September 1963, J. H. Russell (USNM); 1 male, 17 m E Douglas, 3 August 1967, taken at light, S. and S. From-

mer (UCR); 2 males, 17 mi E Douglas, 12 August 1975, taken at light, J. D. Pinto and S. I. Frommer (UCR). **Santa Cruz Co.:** 1 male, 1 female, Mustang Mt., 22 August 1935, R. H. Beamer (KU). **NEW MEXICO. Unspecified Co.:** 1 male, Antelope Wells, 22 August 1963, R. D. Ohmart (ASU).

DIAGNOSIS: *Phytocoris planituberis* is very similar to *validus* but differs by the longer first antennal segment; large flattened tubercle above base of left paramere (fig. 204a); and more elongate sclerotized process of the vesica (fig. 204e). The ratio of length of antennal segment I to width of head across eyes is from 1.30:1 to 1.50:1 for males. This species is easily distinguished from *fuscipennis* and *roseipennis* by the short, dark, simple setae on the pronotum and hemelytra.

DESCRIPTION: *Male.* Length 6.64–7.83, width 1.84–2.23; pale grayish brown general coloration. **Head:** width across eyes 0.97–1.04, vertex 0.46–0.49; pale yellow to brownish yellow; buccula, jugum, and tylus often lightly flecked with red or reddish brown; frons abruptly deflexed apically, meeting tylus along deep depression; tylus prominent; frons and vertex with reddish brown to fuscous markings. **Rostrum:** length 2.83–3.17, reaching between fourth and sixth abdominal segments. **Antennae:** I, length 1.30–1.48, white or pale yellow, reticulated with brown; II, length 2.39–2.84, yellowish brown; III, length 1.80–2.18, yellowish brown or brown; IV, length 1.26–1.53, yellowish brown or brown. **Pronotum:** mesal length 0.99–1.15, posterior width 1.62–1.80; disk grayish yellow, lightly tinged with brown particularly on calli and along posterior submargin, sometimes with indistinct pale line medially; collar and calli often with limited red or reddish brown markings; propleura brownish yellow, sometimes lightly marked with reddish brown. **Scutellum:** weakly convex; pale grayish yellow with reddish brown to fuscous markings; median line pale. **Hemelytra:** pale grayish yellow, often lightly tinged with brown; membrane mottled with dusky flecks. **Legs:** femora white or pale yellow, lightly marked with brown to fuscous; hind femora more extensively darkened and marked with pale spots; tibiae pale with brown to fuscous markings, front pair sometimes with three or four obscured annuli. **Vestiture:** dorsal sur-

face with light and dark, simple setae and with silvery white, sericeous setae. **Genitalia:** Figure 204.

Female. Strongly brachypterous, wing membrane reduced to narrow flap. Similar to male in color and vestiture. Length 5.40, width 2.05. **Head:** width across eyes 1.03, vertex 0.53. **Rostrum:** length 2.91. **Antennae:** I, 1.55; II–IV, missing. **Pronotum:** mesal length 0.76, posterior width 1.21. The female of this species is known from a single specimen taken at Mustang Mt., Arizona.

ETYMOLOGY: From the Latin, *planus* (flat) and *tuberis* (swelling), referring to the flattened left genital tubercle of the male.

DISCUSSION: *Phytocoris planituberis* is known from Cochise and Santa Cruz counties, Arizona, and a single specimen taken at Antelope Wells, New Mexico. The host plant association is not known, but this species probably occurs on grasses and/or herbaceous plants. Several males have been collected at light. The period of occurrence is from August 3 to September 23.

Phytocoris roseipennis Knight

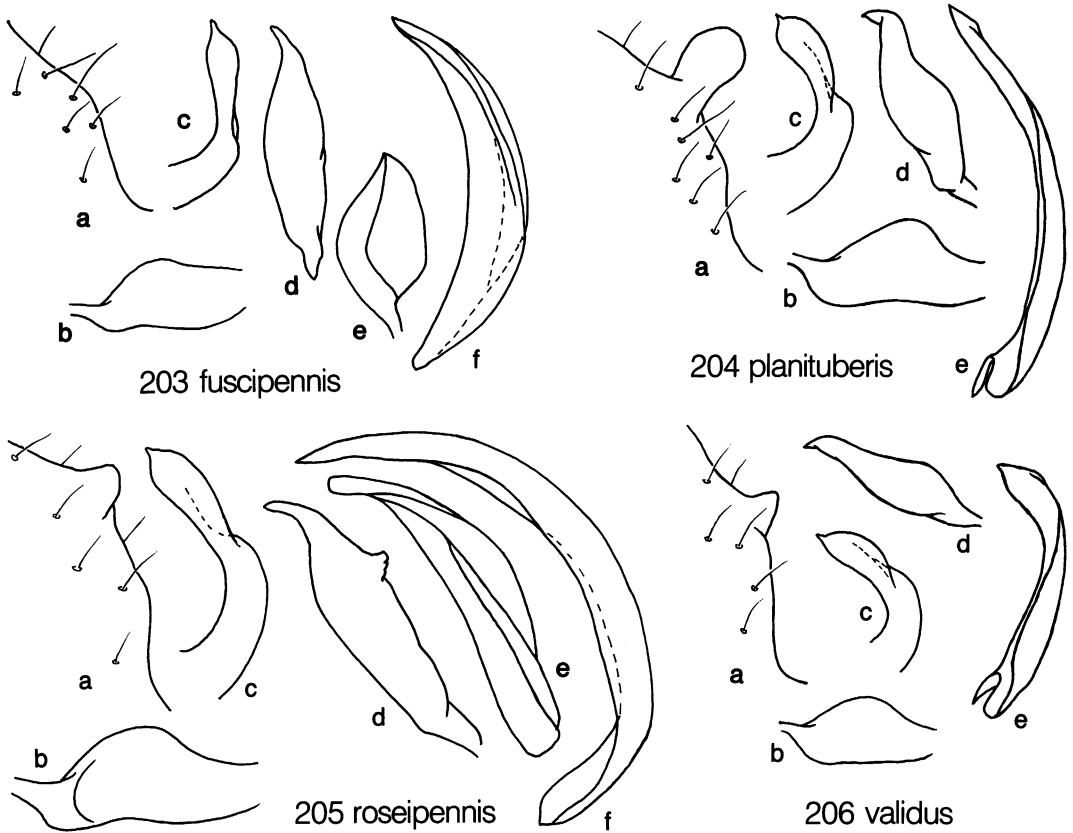
Figures 200–202, 205

Phytocoris roseipennis Knight, 1934: 3–5. – Carvalho, 1959: 214. – Knight, 1968: 215.

TYPES: Described from 25 specimens collected in Cochise and Santa Cruz counties, Arizona. The male holotype, allotype, and 11 paratypes were taken in Santa Cruz Co., 20 September 1928, "on grasses," A. A. Nichol. The type, allotype, and 11 paratypes are retained in the Knight Collection (USNM). Seven paratypes are deposited in the collection of the CAS; five paratypes were not located.

DIAGNOSIS: Length: male 8.1–8.8, female 7.1–7.5. *Phytocoris roseipennis* is distinguished from other species of this group by the reddish tinge on the hemelytra, especially in the male; long first antennal segment, ratio of segment length to posterior width of pronotum from 0.90:1 to 1.10:1 for males; pronotum without dark, simple setae; and structure of the male genitalia, especially the genital capsule with small tubercle above base of left paramere (fig. 205a), and vesica with two sclerotized processes (fig. 205e, f).

DISCUSSION: *Phytocoris roseipennis* has



Figs. 203–206. Male genitalia of *roseipennis* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica, or left sclerotized process for *fuscipennis* and *roseipennis*. f. Right sclerotized process of vesica for *fuscipennis* and *roseipennis*.

been collected in Cochise, Pima, and Santa Cruz counties, Arizona, and Davis Co., Texas. Collection dates are from September 9 to October 11. A large series of males and females was taken 2 mi N of Lochiel, Santa Cruz Co., on grama grass, *Bouteloua hirsuta* Lag. Knight (1934) lists *Aristida*, *Hilaria*, and *Velota* as other potential grass hosts of *roseipennis*.

Phytocoris validus Reuter
Figure 206

Phytocoris validus Reuter, 1909: 31, 32. – Van Duzee, 1917a: 318. – Carvalho, 1959: 220. – Knight, 1968: 235. – Kelton, 1980: 169, fig. 118, map 50. – Henry and Stonedahl, 1983: 461.

TYPES: Reuter published the first description of *validus* apparently under the assump-

tion that P. R. Uhler was preparing to describe this species in the genus *Compsocerocoris* (see preamble and description of *validus* in Reuter, 1909). Since Reuter's description is headed by the title, "*Phytocoris validus* (Uhler)," it appears that he intended to credit Uhler for the new species but move *validus* to the genus *Phytocoris*. Uhler's treatment was never published, so Reuter is credited for the original description of the species. Reuter's description is based on material collected by E. P. Van Duzee at Fort Collins, Larimer Co., Colorado in July. I have examined two specimens that appear to be from the original type series. A male bearing Reuter's hand-printed determination label was designated a lectotype by Henry and Stonedahl (1983). It is deposited in the collection of the CAS.

DIAGNOSIS: Length: male 6.5–7.2, female 5.3–5.9. This species closely resembles *planituberis* but is distinguished by the shorter first antennal segment, small tubercle above base of left paramere (fig. 206a), and sclerotized process of the vesica (fig. 206e). The ratio of length of antennal segment I to width of head across eyes is from 1.15:1 to 1.25:1 for males.

DISCUSSION: *Phytocoris validus* has been collected in Colorado, Montana, New Mex-

ico, South Dakota, and Wyoming. Kelton (1980) added records for species from eastern Alberta, Saskatchewan, and Manitoba. Specimens have been taken as far south as Torrance Co., New Mexico; west to Jefferson Co., Montana; and east to Custer Co., South Dakota. Kelton (1980) gave "herbaceous plants" as the habitat of *validus*. I have examined 18 specimens with collection dates from June 27 to October 1.

ROSTRATUS SPECIES-GROUP

DIAGNOSIS: Recognized by the pale green, or brown to dark brown general coloration; head usually subquadrate to slightly elongate with strongly produced frons and tylus base, and broad vertex (fig. 208); length of eye of male subequal to width of vertex except as noted in species key; dorsum with narrow, dark, scalelike setae mixed with other types of vestiture (fig. 209); and male genitalia with greatly reduced primary membranous sac of vesica, two sclerotized processes, and patches of spinulae on basal lobes (fig. 3).

DESCRIPTION: Small to moderate sized, 4.0–7.8, brown or grayish brown species with dark, simple setae, silvery white, sericeous setae and narrow, dark brown or black, scalelike setae (Note: *consors*, *geniculatus*, and *schwartzi* are pale green species with entirely pale vestiture—except for the dusky flecks on the hemelytra, these taxa lack the distinctive dark markings discussed below that are characteristic of other *rostratus* group species). **Head:** subquadrate to slightly elongate with strongly produced frons and tylus base, broadly developed gena and jula, small eyes, and broad vertex (Note: several taxa have a shorter head with less prominent frons and tylus base, narrower gena and jula, and larger eyes with correspondingly narrower vertex—see key and species treatments for additional detail); antennae brown to dark brown, except reddish brown in *nicholi*; segment I with pale spots on dorsal aspect, ventral surface uniformly darkened; segment II usually with pale, median annulus, basal half sometimes broken by 1–3 pale spots on dorsal aspect; frons strongly deflexed apically, meeting tylus along deep depression, usually with 6–8 fuscous striae laterally. **Pronotum:** posterior sub-

margin of disk with fuscous band or series of dark patches, and 4–6 weakly elevated points; propleura uniformly pale or narrowly to broadly fuscous dorsally, sometimes divided by one or two dark lines medially, at least distal third always pale. **Hemelytra:** grayish white or grayish yellow with brown to fuscous markings, particularly along veins, costal margin, inner margin and outer apical angle of corium, and on cuneus; membrane conspurcate, spots sometimes coalescing to form larger fuscous patches. **Legs:** femora white or pale yellow with reddish brown to fuscous markings, particularly on apical half; dark markings on outer (anterior) surface of front femora usually forming two parallel lines; hind femora usually extensively darkened and marked with pale spots; tibiae pale with reddish brown or fuscous markings; front tibiae usually with four dark annuli including narrow band at base; middle and hind tibiae sometimes with dark annuli. **Male genitalia:** Genital capsule without or with small ridge-like or knoblike protuberance above paramere bases, rarely with larger, cylindrical or slightly tapered tubercle above base of left paramere. **Left paramere:** sensory lobe weakly to strongly produced; shaft weakly to moderately expanded in dorsal view, ventral region laterally flattened; apex rounded or truncate. **Right paramere:** elongate to broadly lanceolate; apex acute. **Vesica:** primary membranous sac greatly reduced; basal lobes sometimes with patch of spinulae or sclerotized region distally; basal process weakly sclerotized, not extending beyond level of gonopore; two sclerotized processes, each with narrow basal attachment to primary membranous sac, right process strongly curved

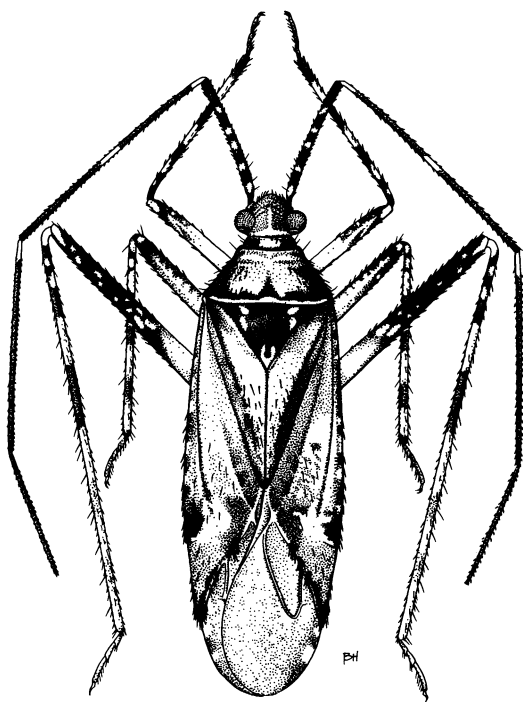


Fig. 207. *Phytocoris purshiae*, dorsal habitus of male.

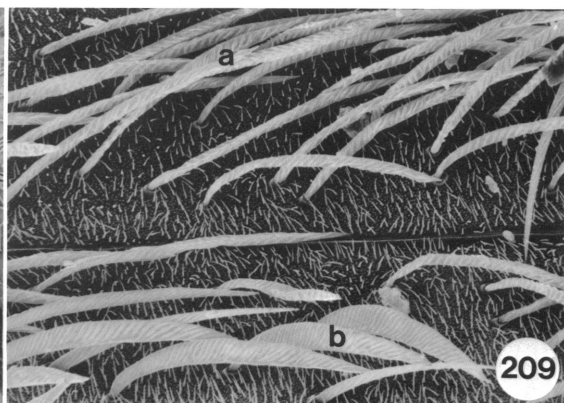
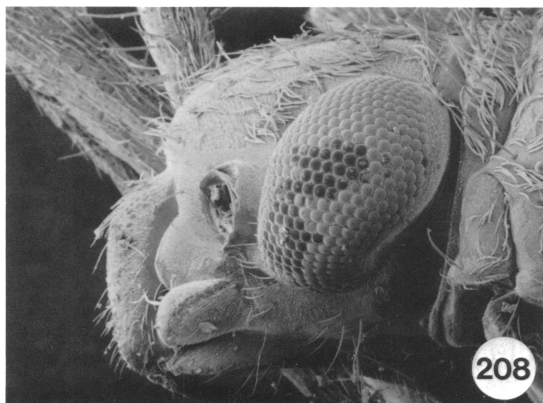
distad of prominent basal support, distal blade elongate or lanceolate, sometimes with 2–4 ridges arising from central shaft; left process variable in shape, usually thin and platelike or straplike with poorly defined, reflexed margins and membranous apical region, sometimes more heavily sclerotized, with

distinct margins and sclerotized apex; left process sometimes more broadly attached along inner margin to primary membranous sac.

DISCUSSION: Members of the *rostratus* group are widely distributed in western North America but are most common in the Inter-mountain Sagebrush and American Desert provinces of the southwestern United States. This group also is well represented in the chaparral zone of California, the Mexican Highland province of southeastern Arizona, and across the Colorado Plateau. Host plant records indicate that the majority of species inhabit shrubby plants mostly in the families Compositae (e.g., *Artemisia*, *Chrysothamnus*), Chenopodiaceae (e.g., *Atriplex*, *Grayia*), and Leguminosae (e.g., *Acacia*, *Prosopis*). Species found on widely distributed plants such as *Artemisia* and *Atriplex* often occur throughout much of the distribution range of the respective host(s).

Many *rostratus* species are attracted to light, which suggests that nocturnal behavior is widespread in this group. I have collected several species in large numbers at night, often from the same plants that yielded few to no specimens during daylight hours. Although the diurnal habits of these species are not known, it is possible that they seek shelter during arid daylight hours, possibly near the base of the host plant or in nearby ground litter.

Rostratus group species are remarkably similar externally, and it is often necessary



Figs. 208, 209. *Phytocoris rostratus*. 208. Lateral view of head. 209. Dorsal vestiture: a, silvery white, sericeous setae; b, narrow, black, scalelike setae.

to examine male genital structures to obtain accurate species identifications. Characters that are particularly useful for separating species included the development of ridges or tubercles on the genital capsule above the base of the left paramere, the size and ornamentation of the basal lobes of the vesica, and the shape of the sclerotized processes.

KEY TO SPECIES OF
THE *ROSTRATUS* GROUP

The following key relies extensively on characters of the male genitalia. In many instances, it is not possible to identify females without associated males.

- 1 Hemelytra pale green with small dusky spots 2
- Hemelytra not green 4
- 2(1) Cuneus and areolar veins tinged or marked with red; genital capsule with very small, ridgelike protuberance above base of left paramere (fig. 222a); left sclerotized process of vesica with small membranous region apically (fig. 236m)
..... *geniculatus* Van D.
- Cuneus and areolar veins without red markings; genital capsule with moderate to strong tubercle above base of left paramere (figs. 217a, 231a); left sclerotized process without membranous region apically 3
- 3(2) Length of antennal segment I of male equal to or slightly greater than width of head across eyes; left genital tubercle prominent, knoblike (fig. 231a); left paramere narrowly expanded distally, inner apical region of arm usually with several strong spines or tubercles (fig. 231c); females strongly brachypterous, membrane of forewing reduced to narrow flap
..... *schwartzi* n. sp.
- Length of antennal segment I of male much greater than width of head across eyes; left genital tubercle less prominent, ridgelike (fig. 217a); left paramere broadly expanded distally, inner apical region of arm without spines or tubercles (fig. 217c); females submacropterous, membrane of forewing reaching to apex of abdomen or slightly beyond ...
..... *consors* Van D.
- 4(1) Femora red or extensively marked with red *nicholi* Knight
- Femora not red or with only limited red markings 4

- 5(4) Ratio of eye length to width of vertex from 0.90:1 to 1.15:1 for males 6
- Ratio of eye length to width of vertex greater than 1.15:1 for males 22
- 6(5) Left sclerotized process of vesica with membranous region apically, or small membranous sac arising near apex .. 7
- Left sclerotized process without membranous region or sac apically, but sometimes weakly sclerotized near apex 17
- 7(6) Length of antennal segment I equal to or greater than posterior width of pronotum 8
- Length of antennal segment I less than posterior width of pronotum 11
- 8(7) Right sclerotized process of vesica not or only slightly expanded beyond basal angle (figs. 213e, 224e) 9
- Right sclerotized process broad, distinctly expanded beyond basal angle (figs. 212e, 228e) 10
- 9(8) Right paramere elongate, length four times or more the greatest width (fig. 213d); right sclerotized process at least twice as long as right paramere (fig. 213e)
..... *beameri* n. sp.
- Right paramere broad, length rarely exceeding three times the greatest width (fig. 224d); length of right sclerotized process approximately equal to length of right paramere (fig. 224e)
..... *maricopae* n. sp.
- 10(8) Darkened basal half of antennal segment II with two or three pale spots dorsally; genital capsule with narrow cylindrical tubercle above base of left paramere (fig. 212a) *baboquivari* n. sp.
- Darkened basal half of antennal segment II without pale spots; genital capsule with small, ridgelike protuberance above base of left paramere (fig. 228a)
..... *purshiae* n. sp.
- 11(7) Genital capsule with ridgelike protuberance or larger, thumblike tubercle above base of left paramere (figs. 216a, 225a); right sclerotized process narrow, width beyond basal angle uniform (figs. 216e, 224e), or with distal region slightly expanded (figs. 225e, 230e) 12
- Genital capsule without ridgelike protuberance or tubercle above base of left paramere (figs. 219a, 229a); right sclerotized process broad, slightly to moderately expanded beyond basal angle, narrowed distally (figs. 219e, 233e) 15
- 12(11) Right sclerotized process slightly expanded distally (figs. 225e, 230e), length of

- process much greater than length of right paramere 13
- Right sclerotized process uniform in width, not expanded distally (figs. 216e, 224e), length of process equal to or slightly greater than length of right paramere 14
- 13(12) Propleuron pale with two transverse fuscous lines medially; left genital tubercle strongly produced, cylindrical (fig. 225a); parameres as in figure 225b-d *minituberculatus* Knight
- Propleuron fuscous, apical fourth to one-third pale; left genital tubercle weakly produced, ridgelike (fig. 230a); parameres as in figure 230b-d *sacramento* n. sp.
- 14(12) Length of antennal segment I of male equal to or slightly less than width of head across eyes; left sclerotized process narrow basally, apex of process with small membranous sac (fig. 236g); left basal lobe of vesica with elongate field of spinulae, right basal lobe without spinulae *cienea* n. sp.
- Length of antennal segment I of male distinctly greater than width of head across eyes; left sclerotized process broad basally, apex of process with large membranous sac (fig. 236o); left basal lobe of vesica with rounded field of spinulae, right basal lobe with elongate field of spinulae *maricopae* n. sp.
- 15(11) Antennal segment II brown or yellowish brown, with poorly defined pale annulus medially; membranous region at apex of left sclerotized process with small field of spinulae (fig. 236x) *sublineatus* Knight
- Antennal segment II dark brown or black with sharply defined pale annulus medially; membranous region at apex of left sclerotized process without spinulae 16
- 16(15) Darkened basal half of antennal segment II with one or two pale spots on dorsal aspect; arm of right paramere with strong tubercle on inner surface (fig. 229d); length 4.0-5.5 *rostratus* Knight
- Darkened basal half of antennal segment II without pale spots; arm of right paramere without, or with very weak tubercle on inner surface; length 4.5-6.5 *deserticola* Knight
- 17(6) Right sclerotized process with three or four strong serrations distally (fig. 211e); outer surface of left sclerotized process with field of small spines (fig. 236b) *arizonensis* n. sp.
- Right sclerotized process without serrations, outer surface of left sclerotized process without field of spines 18
- 18(17) Right basal lobe of vesica with small field of spinulae laterally; left genital tubercle knoblike (fig. 210a) or strongly ridgelike (fig. 234a) 19
- Right basal lobe of vesica without spinulae; left genital tubercle weakly ridgelike (figs. 221a, 223a) 21
- 19(18) Left genital tubercle broadly ridgelike (fig. 234a); basal lobes of vesica large, left lobe with field of stout pointed tubercles laterally, right lobe with elongate sac apically *yavapai* n. sp.
- Left genital tubercle knoblike (figs. 210a, 218a); basal lobes of vesica small, left lobe with field of small spinulae laterally, right lobe without elongate sac apically 20
- 20(19) Left sclerotized process abruptly twisted distally (fig. 236i); shaft of left paramere narrowly expanded distally (fig. 218c); left genital tubercle as in figure 218a *coronadoi* n. sp.
- Left sclerotized process gently curved distally (fig. 236a); shaft of left paramere broadly expanded distally (fig. 210c); left genital tubercle as in figure 210a *aesculinus* n. sp.
- 21(18) Pronotal disk with pale median line; right and left sclerotized processes as in figures 223e, 236n *lineatus* Reuter
- Pronotal disk without pale median line; right and left sclerotized processes as in figures 221e, 236l *ejuncidus* n. sp.
- 22(5) Pronotal disk with pale median line, bordered with fuscous; left genital tubercle prominent, cylindrical, well removed from base of left paramere (fig. 232a) *strigosus* Knight
- Pronotal disk without pale median line; left genital tubercle knoblike (fig. 214a), weakly ridgelike (figs. 220a, 235a), or absent (figs. 215a, 227a) 23
- 23(22) Antennal segment II with pale median annulus 24
- Antennal segment II without pale median annulus *pintoi* n. sp.
- 24(23) Pale annuli on front tibiae much broader than dark annuli; scutellum usually with pale median line *yuma* Knight
- Pale annuli on front tibiae narrower than dark annuli, or equally as broad; scutellum without pale median line .. 25

- 25(24) Propleuron predominantly pale, basal margin and anteromedial line fuscous; scutellum strongly deflexed apically *difformis* Knight
 Propleuron fuscous, apical third pale, sometimes with obscure pale line medially; scutellum evenly convex, not strongly deflexed apically 26
- 26(25) Genital capsule with small knoblike tubercle above base of left paramere (fig. 214a); right basal lobe of vesica with small field of spinulae laterally; length 5.7–7.9 *borregoi* n. sp.
 Genital capsule without tubercle above base of left paramere (fig. 215a); right basal lobe of vesica without spinulae; length 5.3–6.2 *catalinae* n. sp.

***Phytocoris aesculinus*, new species**

Figures 210, 236a

HOLOTYPE MALE: 7.5 mi S of Coronado Nat. For. boundary on Mt. Lemmon Rd., 4700 ft (1430 m), Pima Co., Arizona, 11 June 1983, taken at mercury vapor light, R. T. Schuh, M. D. Schwartz, and G. M. Stonedahl (AMNH).

PARATYPES: ARIZONA. **Graham Co.:** 1 male, Stockton Pass, Pinaleno Mts., 1585–1675 m, 1–2 June 1983, at mercury vapor light, R. T. Schuh and G. M. Stonedahl (AMNH). **Pima Co.:** 4 males, same data as holotype (AMNH); 4 males, 3 females, same data as holotype except collected on *Quercus oblongifolia* Torr. (AMNH); 1 male, Bear Cyn. Picnic Area, 1740 m, Santa Catalina Mts., 12 June 1983, ex. *Quercus oblongifolia*, R. T. Schuh, M. D. Schwartz, and G. M. Stonedahl (AMNH); 1 male, 1 female, Peppersauce Cyn., Santa Catalina Mts., 15 and 17 August 1924, E. P. Van Duzee (CAS).

DIAGNOSIS: Similar to *coronadoi* but differs by the more prominent left genital tubercle (fig. 210a), shaft of left paramere broadly expanded distally (fig. 210c), and left sclerotized process of vesica only gently curved distally (fig. 236a). Distinguished from other brown or grayish brown species of the *rostratus* group by the knoblike left genital tubercle; left sclerotized process of vesica without membranous region apically; and basal lobes of vesica small, each with field of small spines laterally, right lobe without elongate sac apically. The

ratio of eye length to width of vertex is from 0.90:1 to 1.00:1 for males.

DESCRIPTION: *Male.* Length 5.75–6.25, width 1.80–2.05; dark grayish brown general coloration. **Head:** width across eyes 0.91–0.94, vertex 0.44–0.46; vertex and frons mostly dark brown except with pale spots medially; underparts creamy white; tylus, jugum, lorum, and buccula with reddish brown or fuscous markings; eyes occupying approximately three-fifths of head height. **Rostrum:** length 2.78–3.08, reaching sixth or seventh abdominal segment. **Antennae:** inserted near ventral margin of eye; dark brown; I, length 1.41–1.61, with white spots and pale bristlelike setae dorsally and laterally; II, length 2.80–3.00, with pale annulus medially; III, length 1.98–2.12; IV, length 1.25–1.35. **Pronotum:** mesal length 0.88–0.96, posterior width 1.45–1.61; disk grayish white, lightly to moderately tinged with fuscous; collar, calli, and lateral margins usually with darker brown or reddish brown markings; posterior submargin of disk with wavy fuscous line and 4–6 weakly elevated points, extreme margin narrowly pale; propleura fuscous, apical third pale. **Scutellum:** moderately and evenly convex; dark brown with pale spots dorsally and white stripe either side before apex; mesoscutum fuscous, dorsolateral angles pale. **Hemelytra:** grayish white, lightly to moderately suffused with fuscous; veins, inner margin, and posterolateral angle of corium, embolium, and cuneus mostly dark brown; membrane densely conspurcate, with two pale marks on outer margin below apex of cuneus, veins darkened. **Legs:** femora creamy white or pale yellow with reddish brown or fuscous markings, more heavily concentrated on distal half; hind femora more extensively darkened and marked with pale spots; tibiae pale with fuscous markings, front pair with four broad dark annuli, banding on other tibiae less distinct; tibial spines silvery white to golden brown; tarsi brown or dark brown. **Vestiture:** dorsum with dark simple setae, narrow, black scalelike setae, and silvery white sericeous setae. **Genitalia:** Figure 210.

Female. Similar to male in color, vestiture, and structure. Length 5.72–6.10, width 1.78–1.88. **Head:** width across eyes 0.90–0.92, vertex 0.47–0.50. **Rostrum:** length 2.92–3.07,

reaching sixth or seventh abdominal segment. **Antennae:** I, 1.52–1.70; II, 2.95–3.22; III, 2.00–2.36; IV, 1.16–1.27. **Pronotum:** mesal length 0.72–0.83, posterior width 1.37–1.53.

ETYMOLOGY: From the Latin, *aesculinus* (of oak), referring to the habitat of this species on Mexican blue oak.

DISCUSSION: *Phytocoris aesculinus* has been collected in the Pinaleno and Santa Catalina mountains of southeastern Arizona. Collection dates are from June 1 to August 17. The host plant is *Quercus oblongifolia* Torr. Several males were taken at mercury vapor light.

***Phytocoris arizonensis*, new species**

Figures 3, 211, 236b

HOLOTYPE MALE: 7.5 mi S of Coronado Nat. For. boundary on Mt. Lemmon Rd., 1430 m, Pima Co., Arizona, 11 June 1983, ex. *Quercus oblongifolia* Torr., R. T. Schuh, M. D. Schwartz, and G. M. Stonedahl (AMNH).

PARATYPES: ARIZONA. **Cochise Co.:** 1 male, 5 mi W Portal, 1646 m, 12 July 1957, M. Statham (AMNH); 2 males, Stewart Cmp., near Portal, 18–25 July 1971, taken at light, J. T. Doyen (UCB); Huachuca Mts.: 1 male, July 19, H. G. Barber Colln. (USNM); 1 male, Carr Cyn., 24 June 1932, E. G. Linsley (UCB); 1 male, Carr Cyn., 9 August 1940, taken at light, Timberlake (UCR); 1 female, Miller Cyn., 9 August 1974, at black light, S. Szerlip (UCB); 4 males, Miller Cyn., 1524 m, 18–25 June 1974, E. R. Hoebeke (CU); 1 male, Sunnyside, 22 August 1975 (UAZ); 1 male, Sunnyside Cyn., 9 July 1940, R. H. Beamer (KU); 1 male, Sunnyside Cyn., 1860 m, 14 September 1974, R. and J. Wielgus (USNM); 1 male, Texas Pass, 19 July 1917, H. H. Knight (USNM). **Coconino Co.:** 2 males, 2 females, 3.5 mi S Sedona on Rt. 179, T17N, R6E, Sec. 30, 1280 m, 15 July 1983, ex. *Quercus turbinella* Greene, R. T. Schuh and M. D. Schwartz (AMNH). **Gila Co.:** 3 males, 2 females, Miami, 22 July 1932, R. H. Beamer (KU, OSU). **Pima Co.:** 2 males, 1 female, same data as holotype (AMNH); 1 male, 3 females, same data as holotype except taken at mercury vapor light; 2 males, McCleary Cyn. (Sec. 30), N end Rosemont Area, Santa Rita Mts., 1585 m, 15 July 1975, taken at

light, J. Busacca and C. Olson (UAZ); 1 male, same data as before except Ridge Area (Sec. 24), 1646 m, 11 July 1975, "general collecting" (UAZ); 1 male, Mud Spgs., Santa Catalina Mts., 1981 m, 17–20 July 1916 (AMNH); 1 male, Santa Catalina Mts., 15 July 1950, R. H. Beamer (KU). **Santa Cruz Co.:** 1 male, Madera Cyn., 1487 m, 14 July 1963, Y. L. Vesterby (CSU); 1 male, Madera Cyn., 24 August 1980, T. P. and T. A. Friedlander and P. W. Kovarik (TA&M); 3 males, 2 females, Mt. Washington, Nogales, 1829 m, 10–20 July 1919, E. C. Van Dyke (CAS, OSU). **Yavapai Co.:** 1 male, Yarnell, 4 July 1967, ex. *Ceanothus*, W. F. Barr (UID); 3 males, 3 females, 1 mi N of Int. 17 on Rt. 179, T15N R6E Sec. 18, 1160 m, 15 June 1983, ex. *Quercus turbinella*, R. T. Schuh and M. D. Schwartz (AMNH).

DIAGNOSIS: *Phytocoris arizonensis* is distinguished from other species of the *rostratus* group by the large left genital tubercle (fig. 211a), coarse serrations on the right sclerotized process of the vesica (fig. 211e), and left process of vesica fully sclerotized, with small spines on the outer surface (fig. 236b). The ratio of eye length to width of vertex is less than or equal to 1.10:1 for males.

DESCRIPTION: *Male.* Length 4.70–6.16, width 1.49–1.93; grayish brown general coloration. **Head:** width across eyes 0.82–0.95, vertex 0.39–0.47; white or pale yellow; jugum, lorum, and tylus with reddish brown or fuscous markings; vertex and frons lightly to moderately tinged with brown; frons with 6–8 dark striae, sometimes with pale spot(s) medially. **Rostrum:** length 2.07–2.77, reaching between fourth and sixth abdominal segments. **Antennae:** yellowish brown to dark brown; I, length 1.08–1.64, dorsal surface with white markings; II, length 1.94–2.92, with pale annulus medially; III, length 1.49–1.98; IV, length 0.72–1.19. **Pronotum:** mesal length 0.72–0.90, posterior width 1.30–1.55; disk grayish white or pale brownish yellow, posterior submargin with wavy fuscous line and 4–6 weakly elevated points; collar and calli lightly marked with red or reddish brown; propleura fuscous, apical third pale. **Scutellum:** grayish white or grayish yellow with brown to fuscous markings, sometimes extensively darkened but leaving anterolateral angles and apex pale. **Hemelytra:** grayish

white, usually lightly tinged with brown; veins, costal margin, inner margin of corium, and cuneus with fuscous markings; membrane densely mottled with fuscous, outer margin with two pale spots. **Legs:** femora white with reddish brown or fuscous markings particularly on apical half; dark markings on outer surface of front femora forming two parallel lines; hind femora extensively darkened and marked with pale spots; tibiae pale with reddish brown or fuscous markings, front pair with four dark annuli including narrow band at base. **Vestiture:** dorsum with dark simple setae, narrow, black scalelike setae, and silvery white, sericeous setae. **Genitalia:** Figure 211. Left genital tubercle large, cylindrical (fig. 211a).

Female. Similar to male in color, vestiture, and structure. Length 5.02–5.13, width 1.46–1.57. **Head:** width across eyes 0.86, vertex 0.41. **Rostrum:** length 2.18–2.29, reaching fourth or fifth abdominal segment. **Antennae:** I, 1.21–1.39; II, 2.20–2.47; III, 1.53–1.71; IV, 0.99–1.08. **Pronotum:** mesal length 0.70–0.76, posterior width 1.35–1.37.

ETYMOLOGY: Named for its widespread occurrence in the state of Arizona.

DISCUSSION: *Phytocoris arizonensis* has been collected in the following counties in Arizona: Cochise, Coconino, Gila, Pima, Santa Cruz, Yavapai. Adults have been taken on *Quercus oblongifolia* Torr. and *Q. turbinella* Greene. A single specimen also was reported from *Ceanothus* sp., but this may be an incidental host record. Collection dates are from June 11 to September 14. The males of *arizonensis* are readily identified by the large serrations on the right sclerotized process (fig. 211e) and the spinose outer surface of the left sclerotized process (fig. 236b). The shape of the right sclerotized process and number of serrations (three or four) along its distal margin are somewhat variable, but do not appear to be correlated with geography or minor variation in other external and genitalic structures.

***Phytocoris baboquivari*, new species**

Figures 212, 236c

HOLOTYPE MALE: Baboquivari Mts., Pima Co., Arizona, 19 July 1932, R. H. Beamer (KU).

PARATYPES: ARIZONA. **Cochise Co.:** 2 males, Huachuca Mts., 1830 m, 14 June 1928, A. A. Nichol (USNM). **Pima Co.:** 2 males, 1 female, same data as holotype (KU, OSU); 1 male, Baboquivari Mts., F. H. Snow (KU); 1 male, Baboquivari Mts., June 1924, O. C. Poling (CAS); 1 male, Baboquivari Cyn., W side Baboquivari Mts., 25–27 July 1952, H. B. Leech and J. W. Green (CAS); 1 male, Elkhorn Ranch, NE slope Baboquivari Mts., 28 July 1952, H. B. Leech and J. W. Green (CAS); 1 male, Tucson, 11 August 1924, E. P. Van Duzee (CAS); 1 male, 2 females, Tucson Mt. Pk., 1 August 1980, taken at black light, J. D. Pinto (UCR); 1 male, 3.7 mi NW Arivaca, 29 August 1954, taken at light, Timberlake (UCR). **Santa Cruz Co.:** 1 male, Madera Cyn., Santa Rita Mts., 28 August 1966, taken at light, R. S. Beal (NAU); 1 male, Santa Rita Mts., 1370 m, 9 September 1925, A. A. Nichol (USNM). **NEW MEXICO.** 1 male, Huachuca Mts., 30 July 1941, R. H. Beamer (OSU). **TEXAS.** **Brewster Co.:** 1 male, 23 July 1968 and 1 female, 13 August 1968, Green Gulch, Big Bend Nat. Pk., 1430 m, J. E. Hafernik (TA&M). **Gonzales Co.:** 1 male, Palmetto St. Pk., 7 June 1969, Board and Hafernik (TA&M). **Jeff Davis Co.:** 2 males, Ft. Davis, 15–16 August 1965, taken at light, J. C. Schaffner (TA&M); 1 male, 1 mi W Ft. Davis, 22 August 1968, taken at black light, J. E. Hafernik (TA&M); 1 male, 2 mi NW Ft. Davis, 9 August 1969, taken at black light, Board and Hafernik (TA&M). **MEXICO.** **Chihuahua:** 2 males, 35 mi W Moctezuma, 27 April 1981, taken at light, D. A. and J. T. Polhemus (JTP).

DIAGNOSIS: *Phytocoris baboquivari* is distinguished from other brown or grayish brown species of the *rostratus* group by the following combination of characters: ratio of eye length to width of vertex from 0.90:1 to 1.10:1 for males; length of first antennal segment equal to or greater than posterior width of pronotum; darkened proximal half of antennal segment II with two or three pale spots dorsally, excluding pale annulus at base; left genital tubercle narrow, cylindrical (fig. 212a); right sclerotized process distinctly expanded beyond basal angle (fig. 212e); and left sclerotized process with membranous sac arising from each distolateral margin (fig. 236c).

DESCRIPTION: *Male.* Length 5.13–5.67,

width 1.58–1.80; brown general coloration. **Head:** width across eyes 0.85–0.90, vertex 0.41–0.44; white or pale yellow; jugum, lorum, and tylus with reddish brown or fuscous markings; frons and vertex moderately to extensively marked or tinged with brown or fuscous; frons with pale median markings bordered by 6–8, sometimes obscured, dark striae. **Rostrum:** length 2.43–2.75, reaching between fifth and seventh abdominal segments. **Antennae:** brown to black; I, length 1.40–1.55, dorsal aspect with pale markings; II, length 2.47–2.79, with pale annulus medially, darkened basal half with two or three white spots dorsally; III, length 1.75–1.98; IV, length 0.99–1.22. **Pronotum:** mesal length 0.77–0.81, posterior width 1.35–1.48; disk grayish white or grayish yellow, moderately to extensively tinged with brown; posterior submargin of disk with transverse fuscous line and 4–6 weakly elevated points; collar and calli with reddish brown or fuscous markings; propleura fuscous, apical third pale. **Scutellum:** dark brown with pale markings, apex and anterolateral angles pale. **Hemelytra:** grayish white or grayish yellow, moderately to extensively tinged with brown; veins, costal margin, inner margin of corium, and cuneus usually darker fuscous; membrane densely mottled with fuscous, outer margin with two pale spots. **Legs:** femora white or pale yellow with reddish brown or fuscous markings mostly on distal half; dark markings on outer surface of front femora forming two parallel lines; hind femora extensively darkened and marked with pale spots; tibiae pale with reddish brown or fuscous markings, front pair with four, somewhat obscured, dark annuli including narrow band at base. **Vestiture:** dorsum with dark simple setae, narrow, black scalelike setae, and silvery white sericeous setae. **Genitalia:** Figure 212. Left genital tubercle narrow and cylindrical (fig. 212a).

Female. Similar to male in color, vestiture, and structure. Length 5.72, width 1.80. **Head:** width across eyes 0.86, vertex 0.41. **Rostrum:** length 2.61, reaching sixth abdominal segment. **Antennae:** I, 1.58; II, 2.75; III, 2.14; IV, 1.30. **Pronotum:** mesal length 0.72, posterior width 1.30. Measurements taken from the single female specimen collected with the holotype.

ETYMOLOGY: Named for the type locality

in the Baboquivari Mts.; a noun in apposition.

DISCUSSION: *Phytocoris baboquivari* has been collected in southeastern Arizona, New Mexico, western Texas, and northern Chihuahua Province, Mexico. Collection dates are from April 27 to September 9. Several males have been taken at light. The host plant association is not known.

Phytocoris beameri, new species

Figures 213, 236d

HOLOTYPE MALE: Lockwood, Monterey Co., California, 24 July 1935, R. H. Beamer (KU).

PARATYPES: CALIFORNIA. 1 male, same data as holotype (OSU). **Los Angeles Co.:** 2 males, Tanbark Flat, 23 July 1952, B. Tinglof (LACM, OSU). **Riverside Co.:** 1 female, Menifee Valley (hill on W end), 33°39'N, 117°13'W, 550 m, 4 July 1979; ex. *Ceanothus crassifolius* Torr., J. D. Pinto (UCR). **San Diego Co.:** 1 male, [unspecified locality], 18 June 1913, E. P. Van Duzee (CAS). **Santa Barbara Co.:** 1 male, Quatay, 19 July 1941, R. H. Beamer (KU). **Santa Clara Co.:** 1 male, Los Gatos, 15 August 1933, J. A. Kusche (CAS).

DIAGNOSIS: Recognized by the elongate right paramere (fig. 213d); narrow right sclerotized process with length at least twice that of right paramere (fig. 213e); left sclerotized process with small membranous sac arising from posterior surface near apex (fig. 236d); ratio of eye length to width of vertex less than or equal to 1.10:1 in the male; and first antennal segment longer than posterior width of pronotum.

DESCRIPTION: *Male.* Length 6.21–6.64, width 1.73–1.89; brown or grayish brown general coloration. **Head:** width across eyes 0.90–0.94, vertex 0.45–0.48; white or pale yellow; jugum, lorum, and tylus marked with fuscous; frons with 6–8 fuscous striae. **Rostrum:** length 3.19–3.25. **Antennae:** brown to black; I, length 1.64–1.89, marked with pale spots on dorsal surface; II, length 2.92–3.47, with pale annulus medially; III, length 2.21–2.63; IV, length 1.25–1.33. **Pronotum:** mesal length 0.81–0.88, posterior width 1.49–1.57; disk grayish yellow, posterior submargin with wavy fuscous line and 4–6 weakly elevated points; collar and calli marked with reddish brown or fuscous; propleura fuscous, apex

and narrow median line pale. **Scutellum:** fuscous with pale spots, apex sometimes broadly pale. **Hemelytra:** pale gray, moderately tinged with brown, marked with fuscous along veins, costal margin, and inner margin of corium; posterolateral angle of corium and apex of cuneus broadly fuscous; membrane densely conspurcate, outer margin with two pale spots. **Legs:** femora white or pale yellow, reticulated with dark brown; hind femora extensively darkened and marked with pale spots; tibiae pale with fuscous markings, front pair with four dark annuli including narrow band at base. **Vestiture:** dorsum with black simple setae, narrow black scalelike setae, and silvery white sericeous setae. **Genitalia:** Figure 213.

Female. Similar to male in color, vestiture, and structure. Not measured due to poor condition of the available specimens.

ETYMOLOGY: Named in honor of Raymond Hill Beamer (1889–1957), professor of systematic entomology and curator of the Francis Huntington Snow Entomological Collections at the University of Kansas until his retirement in 1954. Dr. Beamer was a skilled and diverse collector of insects and is well known for his work on the Auchenorrhynchous Homoptera.

DISCUSSION: *Phytocoris beameri* is distributed in the Chaparral province of southwestern California from Santa Clara County south to San Diego County. Collection dates are from June 18 to September 24. This species closely resembles *purshiae* but is distinguished by the pale median line on the propleuron, and the narrow right sclerotized process of the vesica (fig. 213e). *Phytocoris beameri* also resembles *maricopae* but differs by the characters given in couplet 9 of the *rostratus* group key. The only host record for this species comes from a single specimen collected in the Menifee Valley, Riverside County, on *Ceanothus crassifolius* Torr.

ADDITIONAL SPECIMENS: Two females in poor condition were examined from the following localities: CALIFORNIA. **San Bernardino Co.:** Mill Crk. Cyn. (CAS). **Santa Clara Co.:** Los Gatos (CAS).

Phytocoris borregoii, new species

Figures 214, 236e

HOLOTYPE MALE: Borrego, San Diego Co., California, 24 April 1955, taken at light, Timberlake (UCR; donated to the AMNH).

PARATYPES: ARIZONA. **Cochise Co.:** 4 males, 27 May 1957 and 5 males, 1 female, 20 August 1957, Douglas, taken at light, J. H. Russell (USNM). **Maricopa Co.:** 3 males, 2 females, Gila Bend, 260 m, 7–8 May 1978, taken at light, R. T. Schuh (AMNH, OSU); 2 males, Sierra Estrella, 24 April 1983, J. T. and D. A. Polhemus (JTP); 2 males, 5 mi N Wickenburg on Rt. 93, 29 April 1981, D. A. and J. T. Polhemus (JTP). **Pima Co.:** 6 males, Organ Pipe Cactus Nat. Mon., 11 April 1965, taken at light, G. L. Jensen and W. J. Turner (UCB). **Pinal Co.:** 10 males, 2 females, Maricopa, 17 October 1927, J. A. Kusche (CAS). CALIFORNIA. **San Diego Co.:** 11 males, 6 females, same data as holotype except 24–28 April 1955 (UCR, OSU); 2 males, Borrego, 23 April 1955, R. Schuster (UCB).

DIAGNOSIS: Recognized by the large eyes, dorsoventral length of eye much greater than width of vertex for males; second antennal segment with pale annulus medially; propleuron fuscous, apical third and sometimes incomplete median line pale; scutellum evenly convex, not strongly deflexed apically; pale annuli on front tibiae narrower than dark annuli; genital capsule with small knoblike tubercle above base of left paramere (fig. 214a); left sclerotized process of vesica fully sclerotized (fig. 236e), dorsal margin not membranous as in *catalinae*; and right basal lobe of vesica with small field of spinulae laterally.

DESCRIPTION: *Male.* Length 5.72–7.88, width 1.84–2.50; dark grayish brown general coloration. **Head:** width across eyes 1.03–1.17, vertex 0.32–0.40; white or pale yellow; jugum, lorum, and tylus with reddish brown or fuscous markings; frons and vertex tinged with brown; frons with several pale spots medially and 6–8 fuscous striae laterally. **Rostrum:** length 2.57–2.90, reaching between third and sixth abdominal segments. **Antennae:** brown to black; I, length 1.22–1.48, dorsal surface with pale markings; II, length 2.73–3.62, with pale annulus medially; III, length 1.80–2.16; IV, length 0.94–1.28. **Pronotum:** mesal length 0.79–0.95, posterior width 1.40–1.84; disk grayish, usually tinged with brown behind calli, along lateral margins, and medially; posterior submargin of disk with wavy fuscous line and 4–6 weakly elevated points; collar brown with pale spot medially; calli with reddish brown or fuscous markings; propleura brown to fuscous, apical third and

sometimes incomplete median line pale. **Scutellum**: evenly convex; fuscous, mottled with grayish white; apex usually broadly pale with dark median stripe. **Hemelytra**: grayish white, moderately to extensively mottled with brown to fuscous especially along veins, inner margin of corium, and on cuneus; membrane densely conspurcate, outer margin with two large pale areas. **Legs**: femora white or pale yellow with reddish brown or fuscous markings mostly on apical half; dark markings on outer surface of front femora forming two parallel lines; hind femora extensively darkened and marked with pale spots; tibiae pale with fuscous markings, front pair with four dark annuli including narrow band at base. **Vestiture**: dorsum with dark simple setae, narrow, black scalelike setae, and silvery white sericeous setae. **Genitalia**: Figure 214. Genital capsule with small knoblike tubercle above base of left paramere (fig. 214a).

Female. Similar to male in color, vestiture, and structure. Length 6.37–7.02, width 2.07–2.29. **Head**: width across eyes 1.05–1.13, vertex 0.48–0.51. **Rostrum**: length 2.75–2.99, reaching fourth or fifth abdominal segment. **Antennae**: I, 1.44–1.60; II, 2.99–3.53; III, 1.89–2.27; IV, 1.03–1.22. **Pronotum**: mesal length 0.85–0.95, posterior width 1.62–1.76.

ETYMOLOGY: Named for the type locality; a noun in the genitive case.

DISCUSSION: *Phytocoris borregoi* is widely distributed in the Mojave and Sonoran deserts. Specimens have been collected as far north as Llano, Los Angeles Co., California and the Nevada Atomic Test Site, Nye Co., Nevada; east to Gila and Cochise counties, Arizona; and south to the US-Mexico border. The western boundary of the distribution is formed by the coast ranges of southwestern California. Adults have been collected on *Larrea tridentata* (DC.) Coville and *Prosopis juliflora* (Swartz) DC. Males and females have been taken at light. Collection dates are from April 7 to November 27.

ADDITIONAL SPECIMENS: 11 specimens were examined from the following localities: ARIZONA. **Cochise Co.**: Ft. Huachuca (CAS). **Gila Co.**: San Carlos (CU). **Maricopa Co.**: Maricopa Mts. (USNM); Wickenburg (CAS, UCD). **Pima Co.**: Ajo (CU); Organ Pipe Cactus Nat. Mon. (UAZ); Papago Well, 40 mi

SW Ajo (UAZ); Santa Cruz Village, Comobabi Mts. (AMNH); Tucson (KU, UAZ, USNM); Tucson Mt. Pk. (UCR); 30 mi E Quijotoa (CU). **Pinal Co.**: 4 mi SE Apache Jct. on Rt. 60 (AMNH). **Santa Cruz Co.**: Sonoita Crk., Patagonia (CAS). **Yuma Co.**: (USNM). CALIFORNIA. **Los Angeles Co.**: Llano (CAF&A). **Orange Co.**: Green R. Camp, Lower Santa Ana Cyn. (CAS). **Riverside Co.**: Banning (CAF&A). **San Bernardino Co.**: Needles (CAS). **San Diego Co.**: Anza-Borrego Desert St. Pk., Borrego Palm Cyn. Cmpgd., 180 m (AMNH). NEVADA. **Nye Co.**: Nevada Atomic Test Site, near Mercury (AMNH, USNM).

Phytocoris catalinae, new species

Figures 215, 236f

HOLOTYPE MALE: Sabino Basin, Santa Catalina Mts., 32°22'N, 110°46.5'W, Pima Co., Arizona, 1158 m, 8–20 July 1916 (AMNH).

PARATYPES: ARIZONA. **Cochise Co.**: 1 male, Cochise Stronghold, 2 October 1954, taken at light, Butler and Werner (UAZ); 1 male, Floor of Carr Cyn., Huachuca Mts., 1646 m, 8–9 August 1952, H. B. Leech and J. W. Green (CAS); 1 male, SW Rsrh. Stn., 5 mi W Portal, 1646 m, 13 September 1966, P. H. Arnaud, Jr. (CAS); 2 males, Tex Cyn., Chiricahua Mts., 1737 m, 23 September 1927, J. A. Kusche (CAS). **Pima Co.**: 1 male, same data as holotype except 15–21 August 1916 (AMNH); 3 males, Kits Peak Rincon, Baboquivari Mts., 31°57'N, 111°33'W, 1234 m, 1–4 August 1916 (AMNH, OSU); 3 males, 30 mi E Quijotoa, 28–29 August 1927 (CU); 1 male, 16 mi S Tucson, 11 August 1924, E. P. Van Duzee (CAS). **Santa Cruz Co.**: 1 male, Canelo, 15 August 1956, taken at light, Morley (UAZ); 1 male, Mt. Washington, Nogales, 7 September 1927, J. A. Kusche (CAS); Madera Cyn., Santa Rita Mts.: 1 male, 1487 m, 14 July 1963, Y. L. Vesterby (CSU); 1 male, 5–6 September 1970, taken at light, E. A. Kane (CAF&A); 1 male, 1402–1707 m, 4 August 1975 (OSU). NEW MEXICO. **Hidalgo Co.**: 1 male, Lordsburg, 13 July 1917, H. H. Knight (USNM).

DIAGNOSIS: *Phytocoris catalinae* closely resembles *borregoi* but differs by the smaller average size; propleuron without pale median

line; and male genitalia with these distinguishing characters: genital capsule without tubercle above base of left paramere (fig. 215a), left sclerotized process of vesica with membranous dorsal margin (fig. 236f), and right basal lobe of vesica without spinulae laterally. This species also resembles *difformis* but is distinguished by the predominantly fuscous propleuron, evenly convex scutellum, and head with larger eyes and narrower vertex.

DESCRIPTION: *Male.* Length 5.35–6.16, width 1.69–1.89; dark grayish brown general coloration. **Head:** width across eyes 1.02–1.09, vertex 0.25–0.32; white or pale yellow; jugum, lorum, and tylus with reddish brown or fuscous markings; frons weakly convex, not strongly deflexed apically as in most members of *rostratus* group; frons with reddish brown or fuscous markings especially near apex, usually broadly pale medially. **Rostrum:** length 2.29–2.56, reaching fourth or fifth abdominal segment. **Antennae:** brown to black; I, length 1.12–1.30, with scattered pale spots and two or three larger pale marks dorsally; II, length 2.57–2.95, with pale annulus medially; III, length 1.44–1.66; IV, missing or teneral. **Pronotum:** mesal length 0.77–0.85, posterior width 1.44–1.53; disk grayish yellow, lightly to extensively darkened with brown to fuscous especially behind calli and along lateral margins; posterior submargin of disk with transverse fuscous line and 4–6 weakly elevated points; collar and calli with reddish brown or fuscous markings, collar with pale spot medially; propleura fuscous, apical third pale. **Scutellum:** moderately and evenly convex; pale with lateral margins, triangular basal region, and spot on apex fuscous. **Hemelytra:** grayish white, moderately to extensively tinged with brown; veins, costal margin, inner margin and posterior angles of corium, and cuneus with fuscous markings; membrane mottled with fuscous, outer margin with two pale spots. **Legs:** femora white or pale yellow, reticulated with reddish brown or fuscous mostly on apical half; dark markings on outer surface of front femora forming two parallel lines; tibiae pale with reddish brown or fuscous markings, front pair with four dark annuli including narrow band at base. **Vestiture:** dorsum with dark simple

setae, narrow, black scalelike setae, and silvery white sericeous setae. **Genitalia:** Figure 215. Genital capsule without tubercle above base of left paramere (fig. 215a).

Female. Unknown.

ETYMOLOGY: Named for the type locality in the Santa Catalina Mts.; a noun in the genitive case.

DISCUSSION: *Phytocoris catalinae* is known only from the type material collected in southeastern Arizona. The host plant association is not known but several specimens have been taken at light. Collection dates are from July 8 to October 2.

The extremely large eyes, narrow vertex, and weakly convex frons of *catalinae* and *borregoi* are not characteristic of *rostratus* group species. These taxa are included here because the genitalic structures of the males are typical of the group. Species with intermediate head morphology (e.g., *difformis*, *pintoi*, *yuma*) further support the placement of *catalinae* and *borregoi* in the *rostratus* group.

Phytocoris cienega, new species

Figures 216, 236g

HOLOTYPE MALE: Presidio, Presidio Co., Texas, 3 June 1968, taken at "black light," J. E. Hafernik (TA&M; donated to the AMNH).

PARATYPES: TEXAS. **Presidio Co.:** 1 male, 1 female, same data as holotype except 5 and 12 June 1968 (TA&M); 1 male, 2 females, 3 mi N Presidio, 20 July 1966, C. L. Cole (AMNH, TA&M); 1 female, 13 mi N Presidio, 26 July, C. L. Cole (TA&M); 2 males, 1 female, 13 mi N Presidio, 30 September 1966, ex. *Acacia farnesiana* (L.) Willd., C. L. Cole (TA&M).

DIAGNOSIS: *Phytocoris cienega* is distinguished from other brown or grayish brown species of the *rostratus* group by the short first antennal segment, length of segment equal to or slightly less than width of head across eyes for males, and by the structure of the male genitalia, especially the small ridge-like left genital tubercle (fig. 216a), and the short narrow right sclerotized process of the vesica, length of process approximately equal to length of right paramere (fig. 216e). It is

further differentiated from the closely related species, *maricopae*, by the narrower left sclerotized process with small membranous sac apically (fig. 236g), left basal lobe of vesica with elongate field of spinulae laterally, and right basal lobe without spinulae. The ratio of eye length to width of vertex is from 1.05:1 to 1.15:1 for males.

DESCRIPTION: *Male.* Length 4.10–4.85, width 1.46–1.58; dark brown general coloration. **Head:** width across eyes 0.86–0.89, vertex 0.39–0.41; vertex and frons except median spot mostly dark brown; underparts white or pale yellow; tylus, base of jugum, and lorum marked with reddish brown or fuscous; eyes large, occupying slightly less than three-fourths of head height. **Rostrum:** length 1.95–2.25, reaching sixth or seventh abdominal segment. **Antennae:** inserted below middle of eye; dark brown; I, length 0.77–0.91, with pale spots and several pale bristlelike setae dorsally and laterally; II, length 1.91–2.22, with pale annulus medially; III, length 1.30–1.47; IV, 0.80–0.85. **Pronotum:** mesal length 0.74–0.86, posterior width 1.35–1.47; disk grayish yellow, extensively tinged and marked with brown or dark brown, markings on collar and calli sometimes more reddish brown; posterior submargin of disk with wavy fuscous line and 4–6 weakly elevated points; posterior margin narrowly pale, weakly sinuate; propleura fuscous, apical third and narrow median line pale. **Scutellum:** mostly fuscous with pale stripe each side before apex and scattered pale spots dorsally. **Hemelytra:** grayish white, lightly to moderately suffused with fuscous; veins, inner margin and posterolateral angle of corium, embolium, and cuneus mostly fuscous; membrane densely conspurcate, with two large pale spots on outer margin below apex of cuneus, veins darkened. **Legs:** femora white or pale yellow with fuscous markings mostly on distal half; hind femora more extensively darkened and marked with pale spots; tibiae pale with fuscous markings, front pair with four dark brown annuli, banding on other tibiae less distinct; tibial spines white to golden brown; tarsi brown or dark brown. **Vestiture:** dorsum with dark simple setae, narrow, dark brown scalelike setae, and silvery white sericeous setae. **Genitalia:** Figure 216. Left genital tubercle small, ridgelike (fig. 216a).

Female. Similar to male in color, vestiture, and structure except eyes slightly smaller and vertex relatively broader. Length 4.58–4.90, width 1.54–1.73. **Head:** width across eyes 0.88–0.91, vertex 0.41–0.46. **Rostrum:** length 2.20–2.36, reaching fifth or sixth abdominal segment. **Antennae:** I, 0.98–1.11; II, 2.15–2.54; III, 1.42–1.54; IV, 0.91–1.00. **Pronotum:** mesal length 0.78–0.85, posterior width 1.35–1.47.

ETYMOLOGY: Named for the Cienega Mts. in Presidio County, Texas; a noun in apposition.

DISCUSSION: This species is known only from the type material collected in Presidio County, Texas. Several adults were taken on *Acacia farnesiana* (L.) Willd. Both sexes have been collected at light. Collection dates are from June 3 to September 30.

Phytocoris consors Van Duzee
Figures 217, 236h

Phytocoris consors Van Duzee, 1918: 287. – Carvalho, 1959: 195. – Knight, 1968: 216.

TYPES: *Phytocoris consors* was described from nine specimens collected at Coachella and Palm Springs, Riverside Co., California, 14–21 May 1917, ex. "whitish vegetation," E. P. Van Duzee. The male holotype (no. 404), allotype (no. 405), and five paratypes are retained in the Van Duzee Collection (CAS). Two paratypes are deposited in the Knight Collection (USNM).

DIAGNOSIS: Length 4.8–6.8. *Phytocoris consors* is similar to *schwartzi*, but differs by the longer first antennal segment (see couplet 3 in key), left genital tubercle of male less prominent (fig. 217a), arm of left paramere without spines or tubercles on inner apical surface, and females submacropterous, with membrane of forewing reaching apex of abdomen or slightly beyond. This species is distinguished from *geniculatus* by the fully sclerotized left vesical process with hooked apex (fig. 236h), and hemelytra without reddish markings on the cuneus and areolar veins.

DISCUSSION: The distribution of *consors* is very similar to that of *geniculatus*. Specimens have been taken as far north as Harney Co., Oregon and Carbon Co., Utah; east to Pueblo Co., Colorado, and Crockett and Randall counties in western Texas; and south to the

US-Mexico border. The Sierra Nevada Mts. and coast ranges of southern California form the western boundary of the distribution. The host plant of *consors* is *Atriplex*; adults have been taken on *A. canescens* (Pursh) Nutt., *A. confertifolia* (Torr. & Frem.) Wats., and *A. lentiformis* (Torr.) Wats. Although *consors* and *geniculatus* have similar host plant associations, they are rarely collected on the same plant. Males of *consors* are attracted to light. Both sexes can be collected in large numbers from *Atriplex* foliage after dark. I have examined several hundred specimens with collection dates from December 17 to October 17.

***Phytocoris coronadoi*, new species**

Figures 218, 236i

HOLOTYPE MALE: Portal, Cochise Co., Arizona, 1500 m, 15 June 1980, taken at light, R. T. Schuh, K. and R. Schmidt (AMNH).

PARATYPES: ARIZONA. Cochise Co.: 1 male, 1 female, same data as holotype (AMNH, OSU); 2 males, 2 females, Portal, 1432 m, 1–28 June 1964, taken at light (OSU, UID); 1 male, Portal, 6 August 1972, S. I. and S. L. Frommer (UCR); 1 male, Portal, 29 August 1974, M. and T. M. Favreau (AMNH); 1 male, 0.5 mi E Portal, 1450 m, 12 June 1980, R. T. Schuh, K. and R. Schmidt (AMNH); Chiricahua Mts.: 2 males, 1 female, Cave Crk., 2134 m, 24 June 1927, J. A. Kusche (CAS); 1 male, Tex Cyn., 1370–1830 m, 30 September 1927, J. A. Kusche (CAS); Huachuca Mts.: 2 males, Carr Cyn., 7 August 1924, J. O. Martin (CAS); 1 male, 1 female, floor of Carr Cyn., 1646 m, 8–9 August 1952, H. B. Leech and J. W. Green (CAS); 1 male, 1 female, Miller Cyn., 1524 m, 20 and 25 June 1974, E. R. Hoebeke (CU). Santa Cruz Co.: 1 male, 1 female, Mt. Washington, Nogales, 1830 m, 11 and 20 July 1919, E. C. Van Dyke (CAS); 1 male, Santa Rita Mts., 17 July 1932, R. H. Beamer (KU); 1 male, Sycamore Cyn., 15 August 1966, H. K. Court (CSU); 1 male, 3 females, Yanks Sprg. Sycamore Cyn., Tumacacori Mts., 3 August 1952, H. B. Leech and J. W. Green (CAS). NEW MEXICO. Grant Co.: 1 male, McMillan Camp, 13 mi N Silver City, 2070 m, 22 July 1961, F., P. and J. Rindge (AMNH).

DIAGNOSIS: Recognized by the dark brown

general coloration; small knoblike left genital tubercle (fig. 218a); right basal lobe of vesica with small field of spinulae laterally; and left sclerotized process abruptly twisted beyond middle, without membranous region apically (fig. 236i). It is further distinguished from the closely related species, *aesculinus*, by the more broadly expanded distal region of the shaft of the left paramere (fig. 218c), and from *yavapai* by the smaller basal lobes of the vesica, left lobe with small spinulae laterally.

DESCRIPTION: *Male.* Length 5.29–5.78, width 1.62–1.85; dark brown general coloration. **Head:** width across eyes 0.86–0.90, vertex 0.43–0.45; white; jugum, lorum, and tylus marked with fuscous; frons and vertex extensively marked or tinged with brown to fuscous, with pale markings medially; frons with 6–8, often obscured, striae. **Rostrum:** length 2.59–2.83, reaching seventh or eighth abdominal segment. **Antennae:** dark brown or black; I, length 1.26–1.49, with pale spots on dorsal aspect; II, length 2.39–2.72, with pale annulus medially; III, length 1.73–2.11; IV, length 1.10–1.24. **Pronotum:** mesal length 0.79–0.86, posterior width 1.40–1.51; disk grayish brown, usually with darker fuscous markings behind calli; posterior submargin of disk with transverse fuscous line and 4–6 weakly elevated points; collar and calli moderately to extensively tinged or marked with brown to fuscous; propleura fuscous, apical third pale. **Scutellum:** fuscous with limited pale markings; weakly convex. **Hemelytra:** grayish white; moderately to extensively tinged with brown, sometimes almost entirely darkened; veins, costal margin, inner margin of corium, and cuneus with fuscous markings; membrane mottled with fuscous, outer margin with two pale spots. **Legs:** femora white with reddish brown or fuscous markings mostly on apical half; dark markings on outer surface of front femora forming two parallel lines; apical two-thirds of hind femora fuscous, with scattered pale spots; tibiae pale with fuscous markings, front pair with four dark annuli including narrow band at base. **Vestiture:** dorsum with black simple setae, narrow, black scalelike setae, and silvery white sericeous setae. **Genitalia:** Figure 218. Left genital tubercle small, narrowly produced, knoblike (fig. 218a).

Female. Similar to male in color, vestiture,

and structure. Length 5.40–5.72, width 1.78–1.91. **Head:** width across eyes 0.87–0.92, vertex 0.46–0.48. **Rostrum:** length 2.56–2.79, reaching fifth or sixth abdominal segment. **Antennae:** I, 1.44–1.51; II, 2.68–2.84; III, 1.73–2.02; IV, 1.04–1.08. **Pronotum:** mesal length 0.72–0.79, posterior width 1.33–1.46.

ETYMOLOGY: Named for its occurrence in the Coronado National Forest of southeastern Arizona.

DISCUSSION: *Phytocoris coronadoi* is known only from Cochise and Santa Cruz counties, Arizona, and Grant Co., New Mexico. Collection dates are from June 1 to September 30. The host plant association is not known. Males and females have been taken at light. The genital structures of the male will readily separate *coronadoi* from other species of the *rostratus* group.

ADDITIONAL SPECIMENS: Six specimens were examined from the following localities: ARIZONA. **Cochise Co.:** Portal (UCR); SW Rsrh. Stn., 5 mi W Portal, 1646 m (CAS); Paradise, Chiricahua Mts., 1524–1830 m (CAS). **Santa Cruz Co.:** Carr Cyn., Huachuca Mts. (CAS); Mt. Washington, Nogales, 1830 m (CAS).

Phytocoris deserticola Knight

Figures 219, 236j

Phytocoris deserticola Knight, 1968: 251, 252, fig. 313.

Phytocoris lineatellus Knight, 1968: 250, 251, fig. 309. NEW SYNONYMY.

TYPES: *Phytocoris deserticola* was described from 10 specimens collected near Mercury, Nye Co., Nevada (Nevada Test Site). The male holotype and two male paratypes were taken in Area CT, Nevada Test Site, 20 June 1965, H. Knight and J. Merino. Four specimens bearing Knight paratype labels were omitted from the original description. Label data for these specimens are: Mercury, Nevada, N.T.S.: 1 female, Area 6M, 17 June 1965, H. Knight and J. Merino; 1 female and 1 nymph, Area 17M, 12 June 1965, H. Knight and J. Merino; 1 female, Area 4DB(B), 5 June 1961. All type material is retained in the Knight Collection (USNM), except one female paratype deposited in the collection of BYU.

The junior synonym, *lineatellus*, was described from three specimens collected near Mercury, Nye Co., Nevada (Nevada Test

Site). The male holotype was taken in Area JAA9, Nevada Test Site, 6 June 1961, "taken in can pit trap." The holotype and allotype are retained in the Knight Collection (USNM); the single female paratype was not located.

DIAGNOSIS: Length 4.5–6.5. This species closely resembles *rostratus* but differs by the larger size, absence of pale spots on the darkened proximal half of antennal segment II, and by the weak tubercle on the inner surface of the arm of the right paramere. It is distinguished from *sublineatus* by the darker second antennal segment with sharply defined white annulus medially, and absence of spinulae on the apical membranous region of the left sclerotized process (fig. 236j); and from *minituberculatus* by the broader right sclerotized process (fig. 219e), and genital capsule without a tubercle above the base of the left paramere (fig. 219a).

DISCUSSION: This species is widely distributed in the Mojave and Sonoran desert regions of southern California from the US-Mexico border to Panamint Springs in Inyo County. Specimens also have been taken in Yuma Co., Arizona; Nye Co., Nevada; and Grand, San Juan, and Washington counties, Utah. Adults have been collected on *Ambrosia dumosa* (Gray.) Payne, *Artemisia tridentata* Nutt., *Coleogyne ramosissima* Torr., *Hilaria rigida* (Thurb.) Benth., *Hymenoclea salsolea* Torr. & Gray, *Lycium* sp., and *Salazaria mexicana* Torr. Males are attracted to light. Females have the wing membrane abbreviated and just covering the apex of the abdomen. I have examined 106 specimens with collection dates from March 17 to June 22.

Phytocoris lineatellus is proposed as a new junior synonym of *deserticola* on the basis of the nearly identical genitalic structures of the male holotypes, and the indistinguishable external appearance of the two taxa. *Phytocoris deserticola* was selected as the senior synonym because it best represents the material examined. Also, the holotype of *lineatellus* is teneral and badly distorted.

Phytocoris difformis Knight

Figures 220, 236k

Phytocoris difformis Knight, 1934: 8, 9. – Carvalho, 1959: 196. – Knight, 1968: 239, fig. 287.

TYPES: Described from 25 specimens col-

lected in southeastern Arizona. The male holotype, allotype, and one female paratype were taken at Texas Pass, 19 July 1917, "on a tent trap light," H. H. Knight. All type material is retained in the Knight Collection (USNM) except 10 paratypes that were not located. Two specimens bearing Knight paratype labels and the following label data were omitted from the original description: Bonita, Arizona, Gowdy Cr. Canyon, July 18, 1917, H. H. Knight, and Santa Rita Mts., Aug. 29, 1924, Ariz., A. A. Nichol, alt. 4000–5000 ft (USNM).

DIAGNOSIS: Length 5.0–6.2. *Phytocoris difformis* is distinguished from other brown or grayish brown species of the *rostratus* group by the following combination of characters: ratio of eye length to width of vertex greater than 1.15:1 for males; second antennal segment with pale annulus medially; pale annuli on front tibiae equal to or less than width of dark annuli; scutellum strongly deflexed apically, without pale line medially; propleuron pale with dorsal margin and anteromedial line fuscous; and genital capsule with small ridge-like to nearly knoblike protuberance above base of left paramere (fig. 220a).

DISCUSSION: *Phytocoris difformis* has been collected in the following counties in Arizona: Cochise, Gila, Graham, Maricopa, Pima, Pinal, Santa Cruz, Yavapai. The host plant of this species is *Prosopis juliflora* (Swartz) DC. Several specimens also have been collected on *Acacia greggii* Gray. and *Condalia globosa* Jtn. Males and females are attracted to light. I have examined 48 specimens with collection dates from May 8 to September 6.

***Phytocoris ejuncidus*, new species**

Figures 221, 2361

HOLOTYPE MALE: Lone Pine, Inyo Co., California, 27 July 1947, R. H. Beamer (KU).

PARATYPES: CALIFORNIA. **Inyo Co.:** 1 male, Westgard Pass, 13 mi E Big Pine, 3 August 1962, taken at light, D. R. Smith (OSU); 2 males, Cedar Flat, Westgard Pass, 2228 m, 19 and 21 August 1963, H. B. Leech (CAS). **Los Angeles Co.:** 1 male, Bouquet, 21 June 1937, N. Westerlund (LACM); 1 male, Burbank, 20 May 1930, C. H. Hicks (USNM); 1 male, Mint Cyn., 6 July 1933, R. H. Beamer (KU); 2 males, Mint Cyn., 7 June 1935, P. Oman (USNM). **Mono Co.:** 1 male, 13 Au-

gust 1963, 2 males, 1 September 1965 and 1 male, 8 August 1966, 1 mi SW Tom's Place, C. A. Toschi and M. J. Tauber (UCB, OSU); 1 male, 2.5 mi NW Casa Diablo Hot Sprgs., 2316 m, 16 August 1962, H. B. Leech (CAS). **Riverside Co.:** 1 male, Desert Spgs., 7 June 1959, taken at light, Timberlake (UCR); 1 male, 1 female, San Jacinto R. Cyn., San Jacinto Mts., 30 May 1940, ex. *Adenostoma*, H. T. Reynolds (UCB).

DIAGNOSIS: *Phytocoris ejuncidus* is distinguished from other brown or grayish brown species of the *rostratus* group by the following combination of characters: ratio of eye length to width of vertex less than or equal to 1.10: 1 for males; genital capsule with weak, ridge-like protuberance above base of left paramere (fig. 221a); right sclerotized process bladeliike, without serrations distally (fig. 221e); left process of vesica fully sclerotized, without membranous region apically or field or spines laterally (fig. 2361); and right basal lobe of vesica without field of small spines laterally. This species keys to couplet 21 with *lineatus* but differs by the shape of the sclerotized processes of the vesica, and pronotal disk without pale median line.

DESCRIPTION: *Male.* Length 6.16–6.59, width 1.66–1.75; grayish white ground color with brown to fuscous markings. **Head:** width across eyes 0.87–0.90, vertex 0.44–0.48; white or pale yellow with reddish brown or fuscous markings; frons with 6–8 dark striae; vertex infuscated, median stripe pale. **Rostrum:** length 2.92–3.01, reaching fifth or sixth abdominal segment. **Antennae:** brown to fuscous; I, length 1.60–1.69, marked with pale spots on dorsal aspect; II, length 2.95–3.37, with pale annulus medially; III, length 1.94–2.23; IV, length 1.08–1.21. **Pronotum:** mesal length 0.83–0.85, posterior width 1.42–1.48; disk grayish white or grayish yellow, lateral margins and posterior submargin infuscated, sometimes broadly so; posterior submargin of disk with 4–6 weakly elevated points; calli and collar with brown or reddish brown markings, median spot on collar pale; propleura fuscous, apex narrowly pale. **Scutellum:** extensively infuscated, anterolateral angles and apex pale; weakly convex. **Hemelytra:** grayish white with brown to fuscous markings particularly along veins, costal margin, inner margin of corium, and on cuneus; posterolateral angle of corium with large fuscous

mark; membrane moderately to densely spurcate, outer margin with two pale spots. **Legs:** femora white or pale yellow with reddish brown or fuscous markings mostly on apical half; hind femora extensively darkened and marked with pale spots; tibiae pale with fuscous markings, front pair with four dark annuli including narrow band at base. **Vestiture:** dorsum with dark simple setae, narrow, black scalelike setae, and silvery white sericeous setae. **Genitalia:** Figure 221. Genital capsule with weak ridgelike protuberance above base of left paramere (fig. 221a).

Female. Brachypterous, wing membrane greatly abbreviated. Similar to male in color, vestiture, and structure. Length 5.24, width 1.69. **Head:** width across eyes 0.93, vertex 0.48. **Rostrum:** length 3.10, reaching seventh abdominal segment. **Antennae:** I, 1.93; II, 3.37; III, missing; IV, missing. **Pronotum:** mesal length 0.74, posterior width 1.22. The female is known from a single specimen.

ETYMOLOGY: From the Latin, *ejuncidus* (slender, lean), referring to the long, slender body.

DISCUSSION: *Phytocoris ejuncidus* has been collected in Inyo, Mono, Los Angeles, and Riverside counties, California. It closely resembles several other *rostratus* group species of that region (e.g., *beameri*, *purshiae*), and is difficult to recognize without examining the genitalic structures of the male. The only host record is from two specimens collected in the San Jacinto Mts., Riverside Co., on *Adenostoma* sp. Collection dates are from May 20 to September 1.

Phytocoris geniculatus Van Duzee

Figures 222, 236m

Phytocoris geniculatus Van Duzee, 1918: 286; 1923: 149. – Carvalho, 1959: 200. – Knight, 1968: 216.

Phytocoris blackwelli Bliven, 1966: 119, 120, pl. X, figs. 16, 17. **NEW SYNONYMY.**

TYPES: Described from 32 specimens taken at Coachella and Palm Springs, Riverside Co., California, 14–19 May 1917, ex. *Atriplex* sp., E. P. Van Duzee. The male holotype (no. 402), allotype (no. 403), and 27 paratypes are retained in the Van Duzee Collection (CAS). The remaining three paratypes are deposited in the Knight Collection (USNM).

The junior synonym, *blackwelli*, was described from two specimens collected at Lost Hills, Kern Co., California, 7 May 1961, ex. *Atriplex* sp., B. P. Bliven. The male holotype (no. 13871) and allotype are retained in the collection of the CAS.

DIAGNOSIS: Length 4.3–7.3. *Phytocoris geniculatus* is distinguished from other species of the *rostratus* group by the pale green general coloration with red markings on the cuneus and areolar veins and by the structure of the male genitalia (fig. 222). The small membranous region at the apex of the left sclerotized process of the vesica (fig. 236m), and the absence of distinct tubercles above the paramere bases (fig. 222a) will readily separate males of *geniculatus* from those of *consors* and *schwartzi*.

DISCUSSION: This species has been collected in Arizona, California, Nevada, and southeastern Oregon. Specimens have been taken as far north as Harney Co., Oregon, and Elko Co., Nevada; east to Graham and Navajo counties, Arizona; and south to the US-Mexico border in Arizona and California. The western boundary of the distribution is formed by the Sierra Nevada Mts. and coast ranges of southern California. *Phytocoris geniculatus* is most frequently taken on *Atriplex*. Other reported host records are *Franseria acathicarpa* (Hook.) Cov. (Van Duzee, 1923) and *Grayia spinosa* (Hook.) Moq. (Knight, 1968). Males are attracted to light. I have examined several hundred specimens with collection dates from December 17 to October 17.

Phytocoris lineatus Reuter

Figures 223, 236n

Phytocoris lineatus Reuter, 1909: 30, 31. – Van Duzee, 1917a: 318. – Carvalho, 1959: 204. – Henry and Stonedahl, 1983: 455, 456.

TYPES: *Phytocoris lineatus* was described from Rifle, Garfield Co., Colorado, 25 July 1900. Reuter (1909) did not designate a type or indicate the number of specimens examined when he described *lineatus*. I have seen a single male that appears to be from the original type series. This specimen was designated a lectotype by Henry and Stonedahl (1983) and is deposited in the collection of the CAS.

DIAGNOSIS: Length 5.6–6.2. *Phytocoris lineatus* is distinguished from other brown or grayish brown species of the *rostratus* group by the following combination of characters: ratio of eye length to width of vertex less than or equal to 1.10:1 for males; pronotal disk with pale line medially; genital capsule of male with weak, ridgelike protuberance above base of left paramere (fig. 223a); right sclerotized process of vesica narrow, broadly curved (fig. 223e), not expanded basally as in most members of the group; left sclerotized process without membranous region apically (fig. 236n); and right basal lobe of vesica without field of spinulae.

DISCUSSION: I have examined six additional specimens of *lineatus* from the following localities: ARIZONA. **Cochise Co.:** Chiricahua Mts. (KU); Huachuca Mts., Sunnyside (UAZ); Sunnyside Cyn., W side of Huachuca Mts., 1830 m (AMNH); 5 mi W Portal, 1646 m (AMNH). **Santa Cruz Co.:** Santa Rita Mts. (KU). UTAH. **Washington Co.:** Leeds (UID). Collection dates are from July 2 to August 22. The host plant association is not known. The female has the membrane of the forewing slightly abbreviated.

***Phytocoris maricopae*, new species**

Figures 224, 236o

HOLOTYPE MALE: 5.5 mi W of Roosevelt Dam at Apache Lk., 533 m, Gila Co., Arizona, 27 May 1983, at mercury vapor light, R. T. Schuh, G. M. Stonedahl, and B. M. Massie (AMNH).

PARATYPES: ARIZONA. **Gila Co.:** 7 males, 2 females, same data as holotype (AMNH); 5 females, same data as holotype except collected on *Celtis pallida* Torr. (AMNH); 1 female, 14 mi N Roosevelt Dam on Rt. 188, 670 m, 27 May 1983, ex. *Hyptis emoryi* Torr., R. T. Schuh, G. M. Stonedahl, and B. M. Massie (AMNH). **Graham Co.:** 1 male, 3 mi W of Rt. 666 on Rt. 266, 1220 m, 2 June 1983, ex. *Chrysothamnus viscidiflorus* (Hook.) Nutt., R. T. Schuh and G. M. Stonedahl (AMNH). **Maricopa Co.:** 4 males, Salt R. Cyn., Apache Lk., 28 April 1981, D. A. and J. T. Polhemus (JTP). **Pinal Co.:** 1 male, 14 mi E Oracle, 27 July 1924, E. P. Van Duzee (CAS); 1 male, same data as above except July 24, J. O. Martin (CAS). **Santa Cruz Co.:** 4 males, Santa Rita Mts., 13 and 15 May

1937, W. Benedict (KU, OSU). IDAHO. **Oneida Co.:** 1 male, Holbrook, 11 August 1971, G. F. Knowlton (USU). NEVADA. **Clark Co.:** 4 males, Charleston Peak, 1830 m, 19 and 22 July 1982, at "UV lite," J. T. Polhemus (JTP). TEXAS. **Jeff Davis Co.:** 1 male, Limpia Crk. Cyn., Davis Mts., 8 September 1952, B. Malkin (CAS). UTAH. **Cache Co.:** 1 male, Blacksmith Fork Cyn., 10 September 1964, taken in malaise trap, W. J. Hanson (USU). **Emery Co.:** 2 males, 6.2 mi W of Rt. 24 in Temple Wash (Goblin Valley Rd. near pictographs), 1707 m, 19 June 1983, R. T. Schuh and M. D. Schwartz (AMNH). **Garfield Co.:** 1 male, 8.7 mi S of Rt. 95 on Rt. 276, Maidenwater Sprg., 1525 m, 19 June 1983, ex. *Berberis fremontii* Torr., R. T. Schuh and M. D. Schwartz (AMNH). **Iron Co.:** 2 males, 1 female, Cedar City, 13 August 1929, R. H. Beamer (KU). **San Juan Co.:** 1 male, 2 females, 7.7 mi N Mexican Hat on Rt. 261, T41SR18E, 1525 m, 17 June 1983, ex. *Quercus undulata* Torr., R. T. Schuh and M. D. Schwartz (AMNH). **Tooele Co.:** 1 male, Dugway Proving Grounds, SE end Cedar Mts., 7 July 1953, taken at light, H. E. Cott (BYU). **Utah Co.:** 1 male, mouth of American Fork Cyn., Rt. 92, 3 mi SE Alpine, T4SR2E, 1463 m, 4 July 1982, ex. *Cowania mexicana* D. Don, M. D. Schwartz (AMNH). **Washington Co.:** 3 males, Leeds Cyn., 28 July 1965, W. J. Hanson and D. W. Davis (USU).

DIAGNOSIS: Recognized by the brownish general coloration; fuscous propleuron with apical third and median line pale; length of antennal segment I subequal to posterior width of pronotum; and by the structure of the male genitalia, particularly the broad ridgelike left genital tubercle (fig. 224a), broad right paramere (fig. 224d), narrow right sclerotized process of vesica with length approximately equal to that of right paramere (fig. 224e), and short, broad left sclerotized process with large membranous sac apically (fig. 236o). This species is further differentiated from *cienega* by the rounded field of spinulae on the left basal lobe of the vesica, and the elongate field of spinulae on the right basal lobe. The ratio of eye length to width of vertex is less than or equal to 1.10:1 in the male. The ratio of length of antennal segment I to posterior width of pronotum is from 0.90:1 to 1.08:1 for males.

DESCRIPTION: *Male.* Length 5.02–5.94, width 1.58–1.87; brown or grayish brown general coloration. **Head:** width across eyes 0.85–0.91, vertex 0.42–0.48; white or pale yellow; jugum, lorum, and tylus marked with reddish brown or fuscous; frons with 6–8 poorly developed, dark striae; vertex infuscated except for pale, median stripe. **Rostrum:** length 2.59–3.08, reaching fifth or sixth abdominal segment. **Antennae:** dark brown or black; I, length 1.19–1.57, with white spots and larger maculae on dorsal surface; II, length 2.38–3.13, with pale annulus medially; III, length 1.73–2.32; IV, length 1.19–1.26. **Pronotum:** mesal length 0.72–0.85, posterior width 1.24–1.46; disk grayish yellow, usually tinged with brown, lightly to extensively marked with fuscous particularly behind calli and along lateral margins; posterior submargin of disk with wavy fuscous line and 4–6 slightly elevated points; propleura fuscous, apical third pale, sometimes with incomplete pale line medially; collar brown to fuscous with pale median spot; calli with brownish to fuscous markings. **Scutellum:** pale gray, moderately to extensively mottled with fuscous. **Hemelytra:** grayish white or grayish yellow with brown to fuscous markings particularly along veins, costal margin, inner margin of corium, and on cuneus; membrane moderately to densely mottled with fuscous, outer margin with two pale spots. **Legs:** femora white, reticulated with fuscous particularly on apical half; dark markings on outer surface of front femora forming two parallel lines; hind femora extensively darkened and with numerous pale spots; tibiae pale with fuscous markings, front pair with four fuscous annuli including narrow band at base. **Vestiture:** dorsum with black simple setae, narrow black scalelike setae, and silvery white sericeous setae. **Genitalia:** Figure 224. Left genital tubercle broad and ridgelike (fig. 224a).

Female. Similar to male in color, vestiture, and structure. Length 4.88–5.45, width 1.72–1.85. **Head:** width across eyes 0.86–0.93, vertex 0.44–0.50. **Rostrum:** length 2.41–3.06, reaching sixth or seventh abdominal segment. **Antennae:** I, 1.25–1.62; II, 2.50–3.17; III, 1.75–2.16; IV, 1.15–1.37. **Pronotum:** mesal length 0.68–0.78, posterior width 1.22–1.39. **Hemelytra:** wing membrane slightly abbreviated.

ETYMOLOGY: Named for the Maricopa Indians, a noun in the genitive case.

DISCUSSION: *Phytocoris maricopae* has been collected in southern Nevada, southern Idaho, Utah, Arizona, and western Texas. Collection dates are from April 11 to September 10. Adults have been collected on *Berberis fremontii* Torr., *Celtis pallida* Torr., *Chrysothamnus viscidiflorus* (Hook) Nutt., *Cowania mexicana* D. Don, *Hyptis emoryi* Torr., and *Quercus undulata* Torr. Both sexes have been taken at light.

ADDITIONAL SPECIMENS: 14 specimens were examined from the following localities: TEXAS. **Presidio Co.:** Presidio (TA&M). **Randall Co.:** Palo Duro Cyn. St. Pk. (TA&M).

Phytocoris minituberculatus Knight

Figures 225, 236p

Phytocoris minituberculatus Knight, 1968: 252, 253, fig. 307.

TYPES: *Phytocoris minituberculatus* was described from a single male collected in Area 5M, Nevada Test Site, Nye Co., Nevada, 14 June 1961. This specimen is deposited in the Knight Collection (USNM).

DIAGNOSIS: Length 5.1–6.5. This species is very similar to *deserticola*, but males are easily distinguished by the well developed, cylindrical left genital tubercle (fig. 225a), narrow right sclerotized process with distal region slightly expanded (fig. 225e), and the much narrower shaft of the right paramere (fig. 225d). I have been unable to separate females of *minituberculatus* and *deserticola* except by association with males. *Phytocoris minituberculatus* runs to couplet 13 in the *rostratus* group key where it is separated from *sacramento* by the predominantly pale propleura with two fuscous lines medially, and by the strongly produced left genital tubercle. The structure of the male genital parameres will further differentiate these two species.

DISCUSSION: I have examined 37 specimens of *minituberculatus* from Kern, Riverside, and San Bernardino counties, California, and Nye Co., Nevada. A series of 16 specimens were collected near Mercury, Nye Co., Nevada on *Artemisia spinescens* D. C. Eat. Most of the individuals collected in California were males taken at light, but one female from Lucerne Valley, San Bernardino

Co., was swept from *Ambrosia dumosa* (Gray.) Payne. The period of occurrence is from March 16 to June 8. Females of this species have the wing membrane abbreviated and just covering the apex of the abdomen.

Phytocoris nicholi Knight

Figures 226, 236q

Phytocoris nicholi Knight, 1928: 29, 30. – Carvalho, 1959: 207. – Knight, 1968: 249.

TYPES: Described from six specimens collected in southeastern Arizona. The female holotype, allotype, and three male paratypes were taken in the Santa Rita Mts., 1372 m, 9 September 1925, A. A. Nichol. All type material is retained in the Knight Collection (USNM) except one paratype deposited in the collection of the UAZ and one paratype that was not located.

DIAGNOSIS: Length 4.5–5.3. *Phytocoris nicholi* is easily distinguished from other species of the *rostratus* group by the red or brownish red general coloration, particularly on the legs, venter, and first antennal segment.

DISCUSSION: *Phytocoris nicholi* has been collected in Cochise, Gila, Pima, and Santa Cruz counties, Arizona. I have examined 11 specimens with collection dates from April 30 to September 9. One specimen was taken on *Phacelia distans* Benth. and another was swept from *Calliandra* foliage. Several specimens were collected at light.

Phytocoris pinto, new species

Figures 227, 236r

HOLOTYPE MALE: Meniffee Valley (hills on W end) 33°39'N, 117°13'W, 550 m, Riverside Co., California, 3 June 1978, taken at light, J. D. Pinto (UCR; donated to the AMNH).

PARATYPES: CALIFORNIA. **Riverside Co.:** 7 males, same data as holotype (UCR, OSU); 1 male, same data as holotype except 21 May 1982 (UCR); 2 males, 4 June 1973, 2 males, 20 June 1974, 1 male, June 1975, Quail Valley, Coastal Sage Scrub Comm., taken at light, J. D. Pinto (UCR). **MEXICO. Baja California Norte:** 3 males, Arroyo Catavina, 35 mi SE El Progreso, 1 April 1976, at light, Doyen, Rude, and Morrison (UCB).

DIAGNOSIS: *Phytocoris pinto* is recognized by the dark brown general coloration; narrow

vertex, ratio of eye length to width of vertex greater than 1.15:1 for males; antennal segment II without pale annulus medially; and genital capsule without tubercle above base of left paramere (fig. 227a).

DESCRIPTION: *Male.* Length 5.51–6.26, width 1.46–1.62; brownish general coloration. **Head:** width across eyes 0.86–0.92, vertex 0.36–0.40; yellow or brownish yellow with fuscous markings; frons with 6–8 dark striae. **Rostrum:** length 2.45–2.57, reaching fourth or fifth abdominal segment. **Antennae:** brown to black; I, length 1.26–1.37, with scattered pale spots on dorsal aspect; II, length 2.56–2.74; III, length 1.67–1.85; IV, length 0.92–1.08. **Pronotum:** mesal length 0.74–0.83, posterior width 1.21–1.30; disk grayish yellow, posterior submargin with wavy fuscous line and 4–6 weakly elevated points; propleura pale with dark anteromedial stripe. **Scutellum:** pale yellow, moderately to extensively marked with fuscous, apical half strongly convex. **Hemelytra:** grayish white or grayish yellow with fuscous markings along veins, inner and outer margins of corium, apex of corium, and on cuneus; membrane densely conspurcate, with two pale marks on outer margin. **Legs:** femora grayish yellow, reticulated with brown or dark brown mostly on apical half; hind femora extensively darkened, marked with pale spots; tibiae pale with fuscous markings, front pair with white spots but lacking distinct pale annuli. **Vestiture:** dorsum with dark simple setae, narrow, black scalelike setae, and silvery white sericeous setae. **Genitalia:** Figure 227. Genital capsule without tubercle above base of left paramere (fig. 227a).

Female. Unknown.

ETYMOLOGY: Named for Dr. John T. Pinto, Professor of Entomology at the University of California, Riverside. Dr. Pinto is an avid collector of Miridae and other insects in the western United States, and provided many specimens for this study.

DISCUSSION: *Phytocoris pinto* is known only from the type material collected in Riverside Co., California, and Baja California Norte, Mexico. The host plant association is not known, but I would speculate that this species breeds on a shrubby plant, possibly restricted to the chaparral region of southwestern California and northern Baja, Mexico.

Phytocoris purshiae, new species

Figures 207, 228, 236s

HOLOTYPE MALE: 16 mi NW of Cambridge on St. Hwy. 71, Washington Co., Idaho, 27 July 1981, ex. *Purshia tridentata* (Pursh) DC., G. M. Stonedahl (AMNH).

PARATYPES: 1 male, 26 females, same data as holotype (OSU, USNM). **OREGON. Baker Co.:** 3 males, 11 females, Wallowa-Whitman Nat. For., T8S R45E Sec. 14, 26 July 1981, ex. *Purshia tridentata*, G. M. Stonedahl (AMNH, CAS, OSU).

DIAGNOSIS: *Phytocoris purshiae* is distinguished from other species of the *rostratus* group by the following combination of characters: grayish brown general coloration with fuscous markings; ratio of eye length to width of vertex less than or equal to 1.10:1 for males; first antennal segment longer than the posterior width of the pronotum; darkened proximal half of antennal segment II without pale spots on dorsal aspect; left genital tubercle weakly produced, ridgelike (fig. 228a); right sclerotized process of vesica broad, distinctly expanded beyond basal angle (fig. 228e); and left sclerotized process with membranous region apically (fig. 236s).

DESCRIPTION: Male. Length 5.62–6.48, width 1.69–1.98; grayish white ground color with fuscous markings. **Head:** width across eyes 0.92–0.95, vertex 0.45–0.47; white or pale yellow; jugum, lorum, and tylus with reddish brown or fuscous markings; frons and vertex extensively infuscated, frons with 6–8 dark striae either side of pale median stripe. **Rostrum:** length 2.74–3.11, reaching seventh or eighth abdominal segment. **Antennae:** dark brown or black; I, length 1.48–1.80, with pale markings on dorsal aspect; II, length 2.72–3.31, with pale annulus medially; III, length 1.98–2.43; IV, length 1.13–1.30. **Pronotum:** mesal length 0.79–0.90, posterior width 1.39–1.60; disk grayish white or grayish yellow, moderately to extensively infuscated, sometimes entirely darkened; posterior submargin of disk with 4–6 weakly elevated points; collar brownish with pale median spot; calli with reddish brown or fuscous markings; propleura fuscous, apical third pale. **Scutellum:** weakly convex; extensively darkened; apex and anterolateral angles usually pale. **Hemelytra:** pale gray, densely marked and tinged with brown to fuscous; clavus mostly pale

between commissure and claval vein; corium usually with distinct pale region medially and at apex; membrane densely conspurcate, outer margin with two pale spots. **Legs:** femora white with reddish brown or fuscous markings mostly on apical half; dark markings on outer surface of front femora forming two parallel lines; hind femora extensively darkened and marked with pale spots; tibiae pale with fuscous markings, front pair with four dark annuli including narrow band at base. **Vestiture:** dorsum with black simple setae, narrow, black scalelike setae, and silvery white, sericeous setae. **Genitalia:** Figure 228.

Female. Similar to male in color, vestiture, and structure. Length 5.29–5.83, width 1.71–1.84. **Head:** width across eyes 0.88–0.95, vertex 0.47–0.51. **Rostrum:** length 2.84–3.08, reaching sixth or seventh abdominal segment. **Antennae:** I, 1.58–1.87; II, 3.01–3.33; III, 2.34–2.43; IV, 1.33–1.48. **Pronotum:** mesal length 0.72–0.79, posterior width 1.35–1.49. **Hemelytra:** membrane slightly abbreviated.

ETYMOLOGY: Named for the genus of its host plant, *Purshia tridentata* (Pursh) DC. (Rosaceae).

DISCUSSION: *Phytocoris purshiae* has been collected in California, Idaho, Oregon, and Washington. Two specimens also were taken in Washoe Co., Nevada. The northernmost and southernmost records are Malott, Okanogan Co., Washington and Lake Arrowhead, San Bernardino Co., California. The host plant of this species is *Purshia tridentata* (Pursh) DC.

ADDITIONAL SPECIMENS: 31 specimens were examined from the following localities: **CALIFORNIA. Butte Co.:** Oroville (CAS). **San Bernardino Co.:** Lk. Arrowhead (CAS). **Santa Barbara Co.:** 6 mi SW New Cuyama (UCB). **Shasta Co.:** Cayton (CAS); 1 mi W Fall R. Mills, 1030 m (AMNH). **Siskiyou Co.:** Yreka (CAF&A). **Tehema Co.:** Dales (KU); 10 mi W Mineral (UCB). **Trinity Co.:** Hawkins Crk. Bridge on Zeigler Rd., 3 km N Hawkins Bar, 244 m (CAS). **Tulare Co.:** Giant Forest (KU). **NEVADA. Washoe Co.:** 4 mi SE Jct. US Hwy. 395 on St. Hwy. 341 (OSU). **OREGON. Harney Co.:** 18 mi N Burns (OSU). **Jackson Co.:** Colestin (CAS). **Josephine Co.:** T41S R7W Sec. 30 (OSU); 13.5 mi SW Grants Pass on US Hwy. 199 (OSU). **Klamath Co.:** Bly Mt. (AMNH, OSU). **WASHINGTON. Okanog-**

an Co.: 0.5 mi S Malott (UCB). **Yakima Co.:** Toppenish (USNM). Collection dates are from June 27 to October 23.

Phytocoris rostratus Knight

Figures 208, 209, 229, 236t

Phytocoris rostratus Knight, 1968: 253, 254, fig. 310.

TYPES: Described from 68 specimens collected in Nye Co. and Washoe Co., Nevada. The male holotype was collected in Area 18M(TB), Nevada Test Site, Nye Co., 22 July 1965, at black light, E. Beck and J. Merino. The holotype, allotype, and six paratypes are retained in the Knight Collection (USNM). Nine paratypes are deposited in the collection of UCB and one is in the collection of BYU. The remaining 50 paratypes were not located.

DIAGNOSIS: Length 4.0–5.5. This species is distinguished from other members of the *rostratus* group by the following combination of characters: general coloration grayish brown with fuscous markings; length of antennal segment I less than posterior width of pronotum; second antennal segment dark brown or black with sharply defined white annulus medially; darkened proximal half of second antennal segment with one or two pale spots on dorsal aspect; genital capsule without tubercle above base of left paramere (fig. 229a); right paramere with strong tubercle on inner surface of arm (fig. 229d); and left sclerotized process membranous apically but without field of spinulae (fig. 236t). The ratio of eye length to width of vertex is less than or equal to 1.10:1 in the male.

DISCUSSION: I have examined 165 specimens of *rostratus* from the following states: California, Colorado, Idaho, Nevada, Oregon, Utah, and Washington. Specimens have been collected as far north as Okanogan Co., Washington, and Lemhi Co., Idaho, and east to Saguache Co., Colorado. The southernmost records are from San Juan Co., Utah; Clark Co., Nevada; and Inyo Co., California. The Cascade Range and Sierra Nevada Mts. form the western boundary of the distribution in California, Oregon, and Washington. Adults have been collected from *Artemisia tridentata* Nutt., *Chrysothamnus nauseosus* (Pall.) Britton., *C. viscidiflorus* (Hook.) Nutt., *Eriogonum fasciculatum* (Benth.) var. *polifolium* (Benth.) Torr. & Gray, and *Gutierrezia*

sarothrae (Pursh) Britt. & Rusby. The period of occurrence is from May 22 to October 20. The wing membrane of the female is strongly abbreviated and reaches only slightly beyond the apex of the cuneus.

Phytocoris sacramento, new species

Figure 230, 236u

HOLOTYPE MALE: 4.8 km S of West Point, Calaveras Co., California, 31 July 1980, S. C. Williams (CAS).

PARATYPES: CALIFORNIA. **Butte Co.:** 2 males, 13 July 1926, 2 males, 24 June 1927, 2 males, 19 July 1927, Oroville, H. H. Keifer (AMNH, CAS); 1 male, Oroville, 3 September 1975, at black light, T. R. Haig (CAF&A). **Calaveras Co.:** 4 males, same data as holotype (AMNH, CAS). **Placer Co.:** 1 male, Bear River, 5 July 1926, E. H. Nast (CAS). **Te-hama Co.:** 1 male, Red Bluff, 27 June 1935, R. H. Beamer (KU). **Tulare Co.:** 1 male, Lemon Cove, 26 July 1929, R. H. Beamer (KU).

DIAGNOSIS: Recognized by the dark brown or grayish brown general coloration; propleuron fuscous with apical fourth to one-third pale; length of antennal segment I less than posterior width of pronotum; and male genitalia with the following distinguishing features: genital capsule with small ridgelike protuberance above base of left paramere (fig. 230a); right sclerotized process narrow, slightly expanded distally, length of process greater than length of right paramere (fig. 230e); left sclerotized process with well-developed membranous sac apically (fig. 236u); parameres as in figure 230b–d. The ratio of eye length to width of vertex is from 1.05:1 to 1.15:1 for males.

DESCRIPTION: *Male.* Length 5.50–6.15, width 1.62–1.90; dark grayish brown general coloration. **Head:** width across eyes 0.92–0.98, vertex 0.42–0.45; creamy white; tylus, base of jugum, lorum, and buccula with reddish brown or fuscous markings; vertex and frons extensively darkened, usually with pale spots medially; frons with 6–8 dark striae; eyes occupying approximately two-thirds of head height. **Rostrum:** length 2.65–3.10, reaching sixth or seventh abdominal segment. **Antennae:** inserted slightly above ventral margin of eye; dark brown; I, length 1.36–1.59, with white spots and pale bristlelike setae dorsally and laterally; II, length 2.92–

3.38, with pale annulus medially; III, length 1.88–2.15; IV, length 1.13–1.31. **Pronotum:** mesal length 0.84–0.98, posterior width 1.48–1.62; disk grayish white, tinged with fuscous; collar, calli, and lateral margins usually with darker brown or reddish brown markings; posterior margin with wavy fuscous line and 4–6 weakly elevated points, extreme margin narrowly pale; propleura fuscous, apical third pale. **Scutellum:** moderately and evenly convex; dark brown with pale stripe either side before apex, reaching anteriorly to near middle; anterolateral angles narrowly pale. **Hemelytra:** grayish white, moderately suffused with fuscous; veins, inner margin and posterolateral angle of corium, embolium, and cuneus mostly dark brown; membrane densely conspurcate, with two pale marks on outer margin below cuneus. **Legs:** femora creamy white or pale yellow with reddish brown or fuscous markings, more heavily concentrated distally; hind femora extensively darkened and marked with pale spots; tibiae pale with fuscous markings, front pair with four broad dark annuli, banding on other tibiae less distinct; tibial spines silvery white to golden brown; tarsi brown or dark brown. **Vestiture:** dorsum with dark simple setae, narrow, dark brown or black, scalelike setae, and silvery white sericeous setae. **Genitalia:** Figure 230.

Female. Unknown.

ETYMOLOGY: Named for its occurrence in the Sacramento Valley of central California; a noun in apposition.

DISCUSSION: This species is distributed in the central valley region of California from Tehama County south to Tulare County. Collection dates are from June 24 to September 3. The host plant association is not known. One specimen from the paratype series was taken at UV light.

***Phytocoris schwartzi*, new species**

Figures 231, 236v

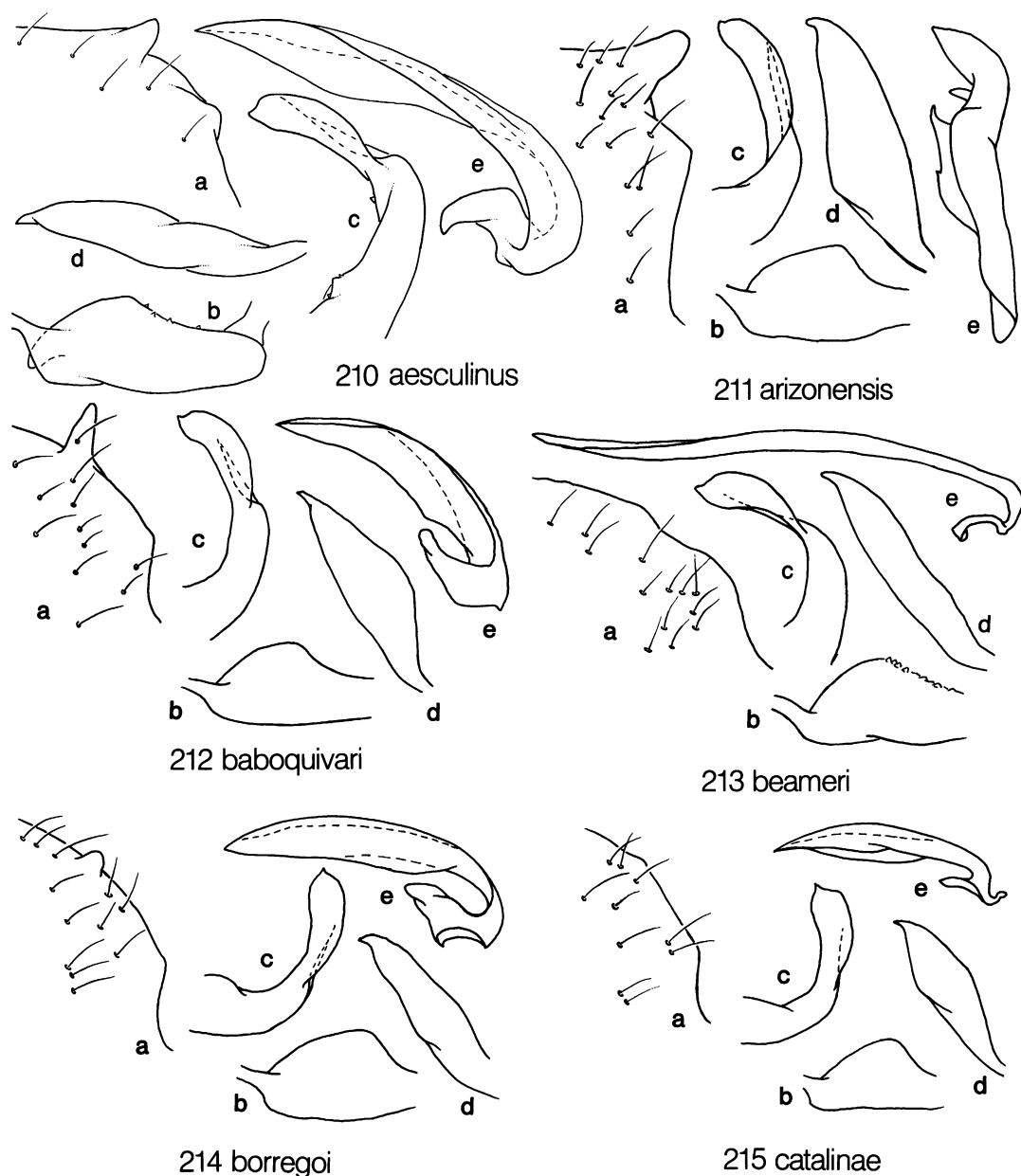
HOLOTYPE MALE: 23.7 mi S of Myton Wells Draw, T10S R15E, 6000 ft (1830 m), Duchesne Co., Utah, 9 July 1982, ex. *Ceratoides lanata* (Pursh) Howell, M. D. Schwartz (AMNH).

PARATYPES: NEW MEXICO. **Eddy Co.:** 3 males, 2 females, 32°19.8'N, 103°47.3'W (Site 7), 23 September 1979, ex. *Artemisia filifolia* Torr., R. R. Murray and J. C. Schaffner

(TA&M). **UTAH. Duchesne Co.:** 7 males, 24 females, same data as holotype (AMNH).

DIAGNOSIS: Similar in structure and coloration to *consors* and *geniculatus*, but distinguished from these species by the shorter first antennal segment, length equal to or slightly greater than width of head across eyes for the male; strongly brachypterous female, membrane of forewing reduced to a narrow flap; and by the structure of the male genitalia, especially the prominent knoblike left genital tubercle (fig. 231a) and arm of left paramere with several strong spines or tubercles on inner apical surface (fig. 231c). The shape of the right paramere and the sclerotized processes of the vesica also are diagnostic.

DESCRIPTION: *Male.* Length 4.75–6.05, width 1.39–1.80; pale greenish white general coloration. **Head:** width across eyes 0.81–0.89, vertex 0.41–0.44; greenish white or pale yellow; frons strongly convex, meeting tylus along deep depression. **Rostrum:** length 2.14–2.70, reaching fifth or sixth abdominal segment. **Antennae:** inserted slightly above ventral margin of eye; I, length 0.81–1.00, pale green with dusky spots and numerous erect pale bristlelike setae dorsally and laterally; II–V, brown or brownish yellow; II, length 1.78–2.14; III, length 1.18–1.31; IV, length 0.95–1.11. **Pronotum:** mesal length 0.81–0.98, posterior width 1.26–1.62; disk greenish white or pale yellow, usually with heavier concentration of silvery white scalelike setae on median line; posterior margin distinctly sinuate; calli weakly elevated; propleura uniformly pale. **Scutellum:** white or greenish white; moderately and evenly convex; surface sometimes roughened medially. **Hemelytra:** white or greenish white with scattered dusky flecks especially on inner half of clavus, inner apical region of corium, and cuneus; membrane pale with dusky spots, sometimes coalescing to form larger fuscous marks along outer margin of membrane and inside small areole. **Legs:** femora white or pale yellow with brown markings mostly on apical half; hind femora sometimes with more extensive reticulate pattern of brown or dark brown, sometimes also lightly tinged with red; tibiae pale, with no dark annuli; tibial spines golden; tarsi and sometimes apices of tibiae yellowish brown. **Vestiture:** dorsum with pale simple setae, silvery white sericeous setae, and sometimes

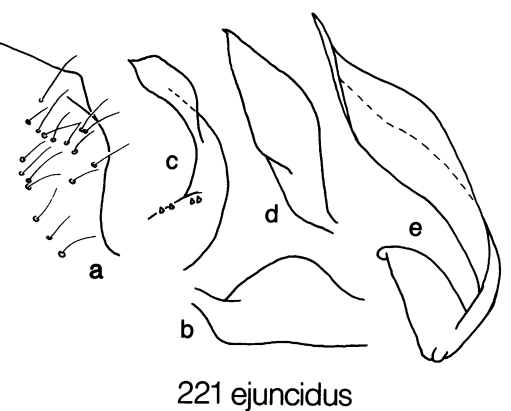
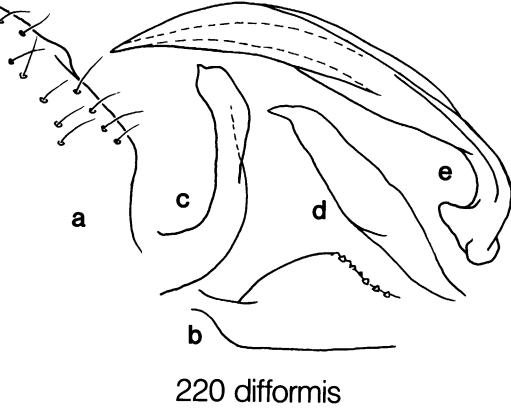
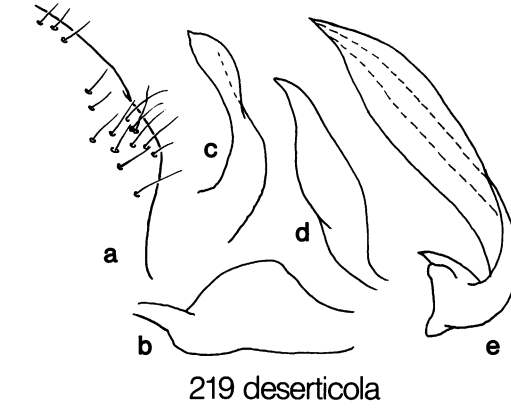
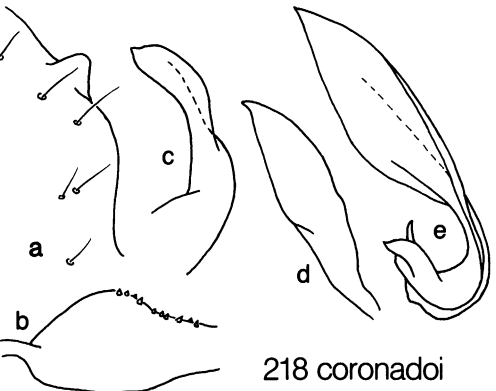
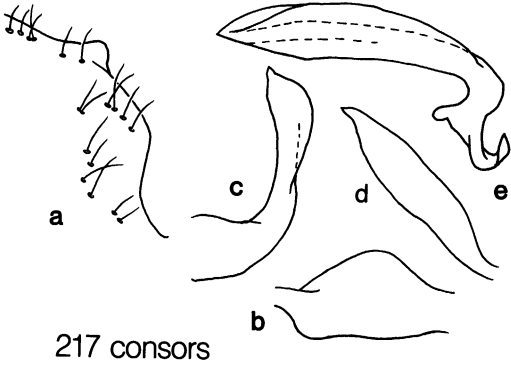
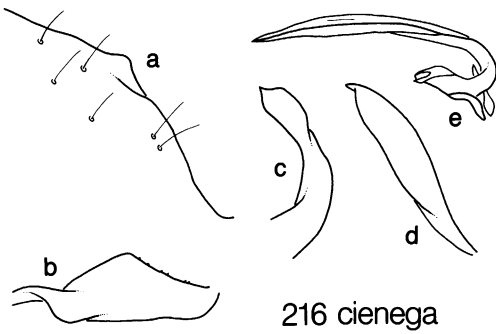


Figs. 210–215. Male genitalia of *rostratus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Right sclerotized process of vesica.

limited brown bristlelike setae. **Genitalia:** Figure 231.

Female. Strongly brachypterous, membrane of forewing reduced to narrow flap. Similar to male in color, vestiture, and structure except pronotum smaller, nearly flat, and with posterior margin strongly concave medially; eye slightly smaller, vertex relatively

broader; and first antennal segment longer. Length 4.42–5.58, width 1.45–1.70. **Head:** width across eyes 0.85–0.93, vertex 0.49–0.51. **Rostrum:** length 2.33–2.92, reaching between fifth and seventh abdominal segments. **Antennae:** I, 0.96–1.21; II, 1.99–2.47; III, 1.25–1.45; IV, 0.98–1.16. **Pronotum:** mesal length 0.62–0.71, posterior width 0.99–1.12.

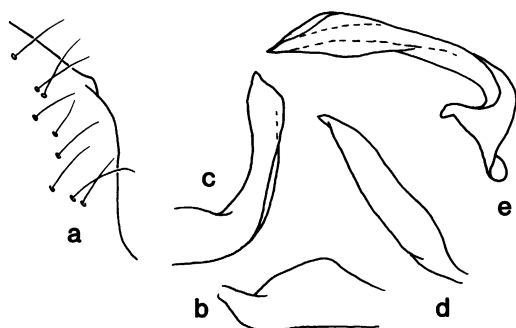
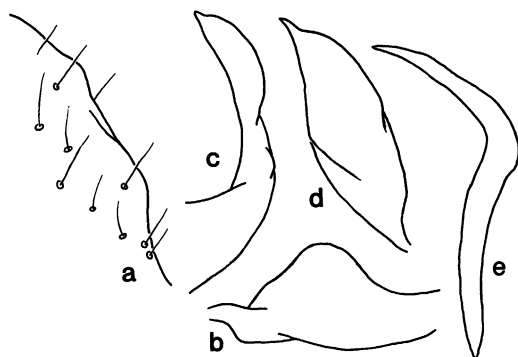
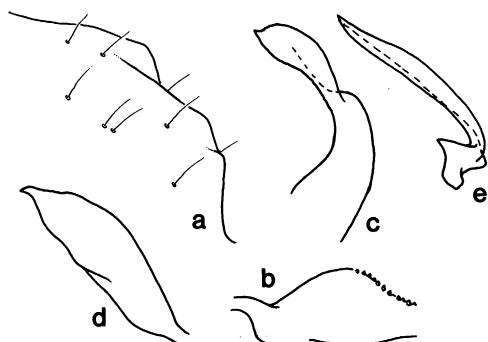
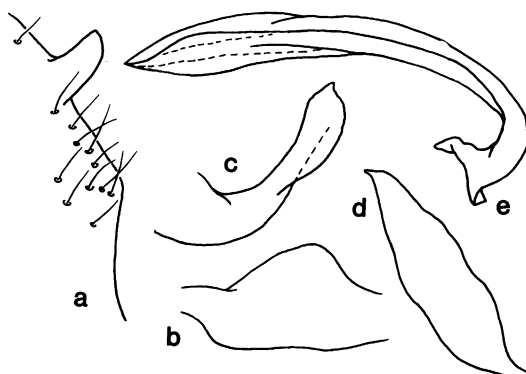
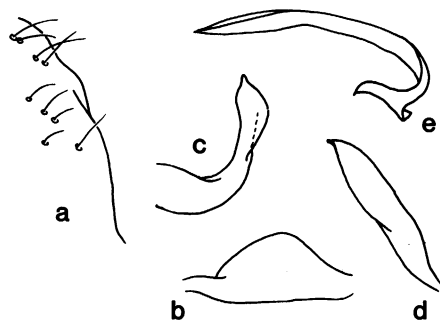
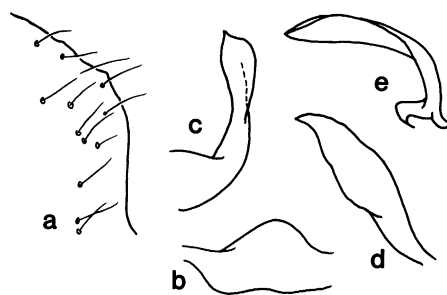


Figs. 216–221. Male genitalia of *rostratus* group species. **a**. Left dorsolateral margin of genital capsule. **b**. Arm of left clasper, lateral view. **c**. Shaft of left clasper, dorsal view. **d**. Right clasper, lateral view. **e**. Right sclerotized process of vesica.

ETYMOLOGY: Named for my good friend Dr. Michael D. Schwartz, who spent many hours collecting specimens for this study and also provided valuable comments on the final version of the manuscript.

DISCUSSION: This species is known from

five widely disjunct populations in Arizona, Colorado, New Mexico, and Utah. Adults have been collected on *Ceratoides lanata* (Pursh) Howell and *Artemisia filifolia* Torr. Collection dates are from June 17 to September 23.

222 *geniculatus*223 *lineatus*224 *maricopae*225 *minituberculatus*226 *nicholi*227 *pintoii*

Figs. 222–227. Male genitalia of *rostratus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Right sclerotized process of vesica.

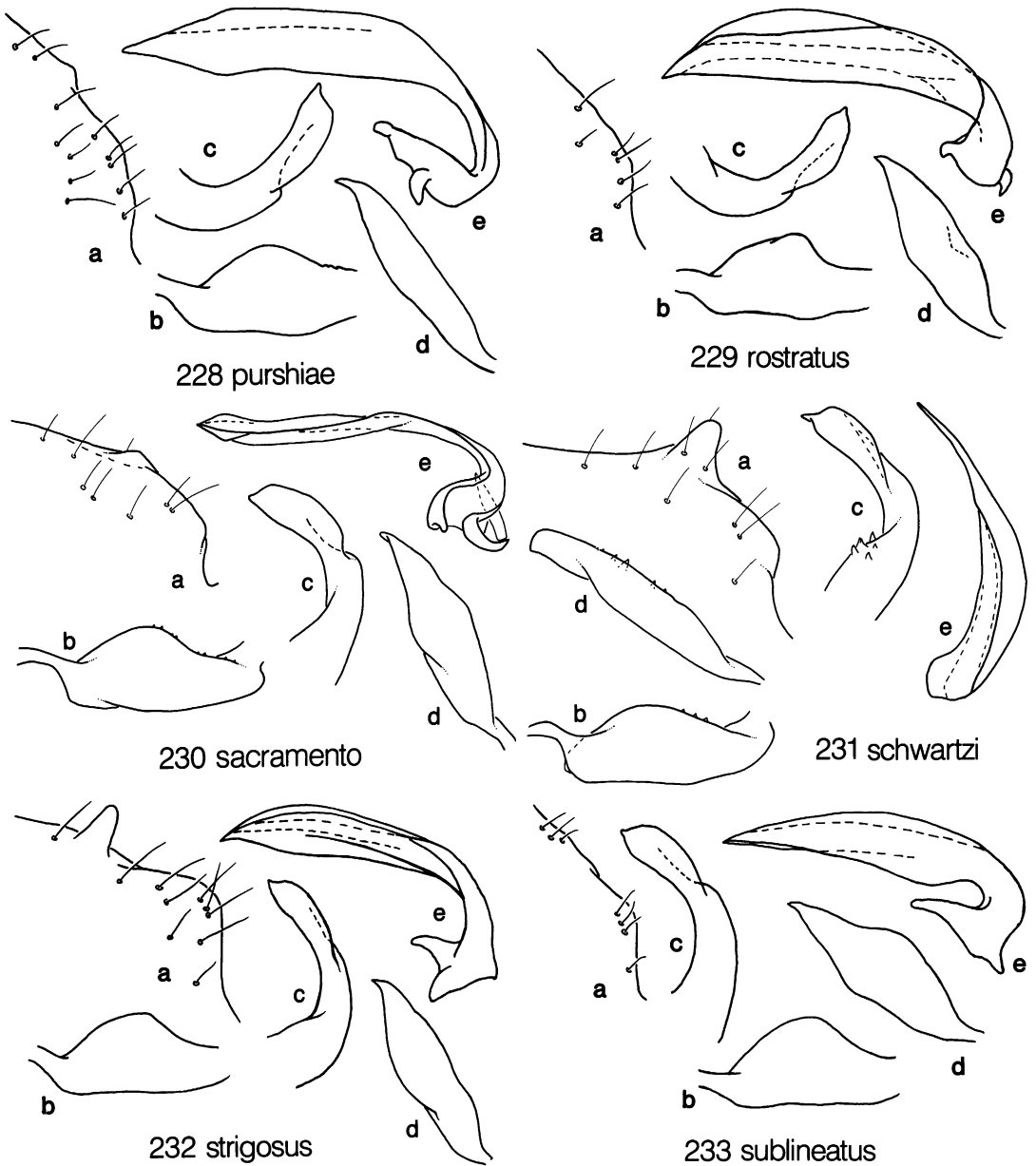
ADDITIONAL SPECIMENS: 15 specimens were examined from the following localities: ARIZONA. **Coconino Co.:** Grand Canyon, North Rim (USNM). COLORADO. **Weld Co.:** 5 mi NW of Roggen (AMNH, JTP). UTAH. **Sevier Co.:** Richfield (USNM).

Phytocoris strigosus Knight

Figures 232, 236w

Phytocoris strigosus Knight, 1925a: 51, 52. – Carvalho, 1959: 217. – Knight, 1968: 250.

Phytocoris flavellus Knight, 1968: 234, fig. 279. **NEW SYNONYMY.**

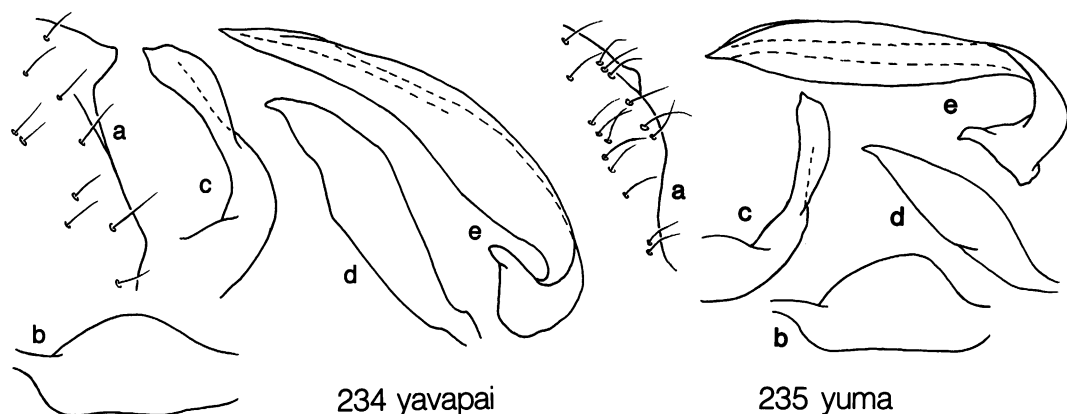


Figs. 228–233. Male genitalia of *rostratus* group species. **a**. Left dorsolateral margin of genital capsule. **b**. Arm of left clasper, lateral view. **c**. Shaft of left clasper, dorsal view. **d**. Right clasper, lateral view. **e**. Right sclerotized process of vesica.

TYPES: *Phytocoris strigosus* was described from 14 specimens collected in Cochise and Pima counties, Arizona, and Luna Co., New Mexico. The male holotype, allotype, and four male paratypes were taken at Tucson, Pima Co., Arizona, 19 April 1924, A. A. Nichol. All type material is retained in the Knight

Collection (USNM) except two paratypes deposited in the UAZ collection, one paratype in the CAS collection, and four paratypes that were not located.

The junior synonym, *flavellus*, was described from 21 specimens collected near Mercury, Nye Co., Nevada (Nevada Test



Figs. 234, 235. Male genitalia of *rostratus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Right sclerotized process of vesica.

Site). The male holotype, allotype, and three paratypes were taken in Area 16M, Nevada Test Site, 11 June 1965, ex. *Grayia spinosa* (Hook.) Moq., H. Knight and J. Merino. All type material is retained in the Knight Collection (USNM) except two paratypes deposited in the collection of BYU. One male bearing a Knight paratype label and the following label data was omitted from the original description: Mercury, Nevada, M (TB), VIII-5-1965, Joe Merino.

DIAGNOSIS: Length 4.4–4.6; pale yellow to brownish general coloration. *Phytocoris strigosus* is easily recognized by the large eyes and relatively narrow vertex (see couplet 5 in key); pale median line on the pronotal disk, bordered with fuscous; and by the prominent tubercle positioned well forward on the left margin of the genital capsule (fig. 232a).

DISCUSSION: *Phytocoris strigosus* is widely distributed in the western United States except for the extreme northern region. Specimens have been collected as far north as Umatilla Co., Oregon, and Cassia Co., Idaho; east to Sandoval Co., New Mexico, and Brewster Co., Texas; and south to the US-Mexico border in Arizona and California. The western boundary of the distribution is formed by the Cascade Range, Sierra Nevada Mts., and the coast ranges of southern California. I have examined several hundred specimens with collection dates from March 9 to December 17. Much of this material, representing both sexes, was taken at light. Adults have been collected on *Ambrosia* sp.,

Chrysothamnus paniculatus (Gray) Hall., *Grayia spinosa* (Hook.) Moq., *Gutierrezia sarothrae* (Pursh) Britt. & Rusby., *Haplopappus* sp., *Hymenoclea salsola* Torr. & Gray, *Psorothamnus fremontii* (Torr.) Barneby, and *Tetradymia* sp.

The general coloration of *strigosus* is quite variable, ranging from pale yellow to dark brown. In lighter specimens, the pale median line on the pronotal disk is often obscure, but the well-developed left genital tubercle will readily identify the male.

I have examined the type and paratypes of *flavellus* and found these specimens to be conspecific with *strigosus*. They differ from the holotype of *strigosus* only by the lighter general coloration. All other features of the external morphology and male genitalia are nearly identical for the two taxa. Based on this information, *flavellus* is proposed as a new junior synonym of *strigosus*.

Phytocoris sublineatus Knight

Figures 233, 236x

Phytocoris sublineatus Knight, 1968: 254, 255, fig. 312.

Phytocoris subcinctus Knight, 1968: 254, fig. 311.
NEW SYNONYMY.

Phytocoris tanneri Knight, 1968: 257, 258, fig. 317.
NEW SYNONYMY.

TYPES: *Phytocoris sublineatus* was described from two male specimens collected in Utah. The holotype was taken in a light trap at Richfield, Sevier Co., 8 July 1930 and

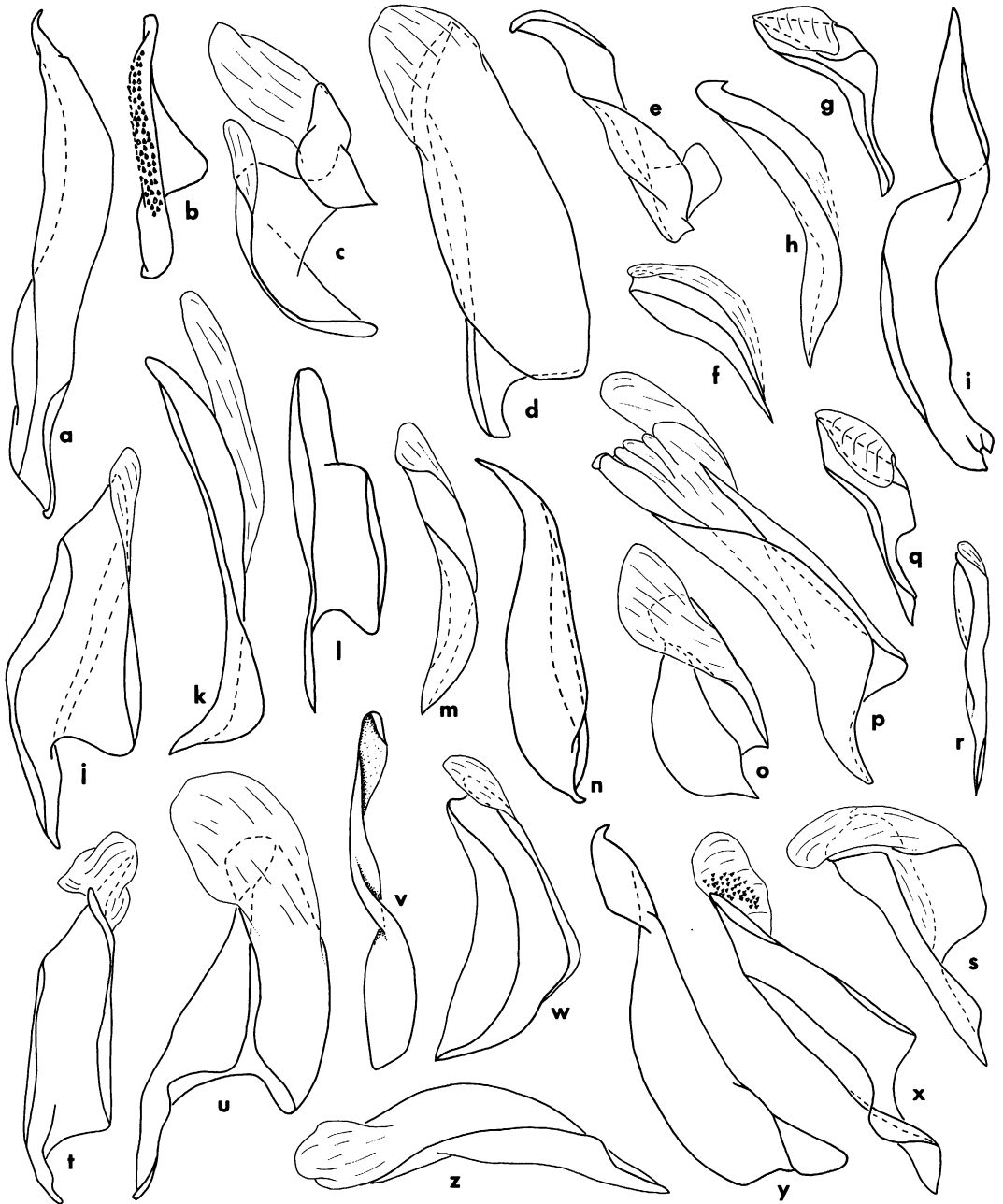


Fig. 236. Left sclerotized process of vesica for *rostratus* group species. a. *aesculinus*. b. *arizonensis*. c. *baboquivari*. d. *beameri*. e. *borregoi*. f. *catalinae*. g. *cienea*. h. *consors*. i. *coronadoi*. j. *deserticola*. k. *difformis*. l. *ejuncidus*. m. *geniculatus*. n. *lineatus*. o. *maricopae*. p. *minituberculatus*. q. *nicholi*. r. *pinto*. s. *purshiae*. t. *rostratus*. u. *sacramento*. v. *schwartzi*. w. *strigosus*. x. *sublineatus*. y. *yavapai*. z. *yuma*.

the paratype was collected at Soldier Summit, Wasatch Co., 13 August 1906. The holotype is retained in the Knight Collection (USNM); the paratype was not located.

The junior synonym, *subcinctus*, was de-

scribed from six specimens taken in a light trap at Richfield, Sevier Co., Utah, 15 August 1929, E. W. Davis. The holotype and three paratypes are retained in the Knight Collection (USNM) and one paratype is deposited

in the collection of BYU. One paratype was not located.

The junior synonym, *tanneri*, was described from nine males collected in Utah and New Mexico. The holotype and six paratypes were taken in a light trap at Richfield, Sevier Co., Utah, 15 July 1929, E. W. Davis. All type material is retained in the Knight Collection (USNM), except one paratype deposited in the collection of BYU, and one paratype that was not located.

DIAGNOSIS: Length 4.3–6.8. *Phytocoris sublineatus* is very similar to *deserticola* and *rostratus* but differs by the lighter, yellowish brown or brown second antennal segment with poorly defined median annulus, and by the small field of spinulae on the apical membranous region of the left sclerotized process (fig. 236x). The propleuron of *sublineatus* is crossed by a single fuscous line, whereas in *deserticola* and *rostratus*, there are usually two fuscous lines with the lower line often incomplete.

DISCUSSION: *Phytocoris sublineatus* is distributed in Arizona, Colorado, western Kansas, New Mexico, western Texas, and Utah. Specimens also have been collected in White Pine Co., Nevada, and Niobrara Co., Wyoming. Adults have been taken on *Artemisia*, *Atriplex*, *Chrysothamnus*, and *Gutierrezia*. Collection dates are from June 6 to September 7.

I have examined the holotypes and available paratypes of *subcinctus* and *tanneri* and found these specimens to be conspecific with *sublineatus*. The holotypes of *subcinctus* and *tanneri* are larger than the average size specimen of *sublineatus*, but the genital structures of the three taxa are nearly identical. The antennal characters used by Knight (1968) to separate *subcinctus*, *sublineatus*, and *tanneri* are highly variable and do not represent species specific differences. *Phytocoris sublineatus* was selected as the senior synonym of this complex because the type is most representative of the material examined.

***Phytocoris yavapai*, new species**

Figures 234, 236y

HOLOTYPE MALE: 3.5 mi S of Sedona on Rt. 179, T17N R6E Sec. 30, 4200 ft (1280 m), Coconino Co., Arizona, 15 June 1983, ex. *Quercus turbinella* Greene, R. T. Schuh and M. D. Schwartz (AMNH).

PARATYPES: ARIZONA. **Maricopa Co.:** 1 male, Sunflower (CL1633), 2 June 1981, J. T. Polhemus (JTP). **Yavapai Co.:** 1 male, Prescott, 8 July 1917, C. A. Hill (CAS); 1 male, Prescott Nat. For., Indian Crk. Cmp., 27 June 1957, G. H. Nelson (UCD); 2 males, Yarnell, 29 July 1933, R. H. Beamer (KU, OSU); 1 male, Yarnell, 4 July 1967, ex. *Ceanothus*, W. F. Barr (UID).

DIAGNOSIS: Most similar to *aesculinus* and *coronadoi* but differs by the broad, ridgelike left genital tubercle (fig. 234a); shape of the sclerotized processes of the vesica (figs. 234e, 236y); and large basal lobes of the vesica, left lobe with field of stout pointed tubercles laterally and right lobe with elongate sac apically. Distinguished from other brown or grayish brown species of the *rostratus* group by the fully sclerotized left vesical process, without membranous region apically (fig. 236y); right sclerotized process broadly bladelike, without serrations distally (fig. 234e); and right basal lobe of vesica with field of spinulae laterally. The ratio of eye length to width of vertex is less than 1.10:1 for males.

DESCRIPTION: *Male.* Length 5.62–5.72, width 1.67–1.85; brown or grayish brown general coloration. **Head:** width across eyes 0.85–0.93, vertex 0.43–0.46; white or pale yellow; jugum, lorum, and tylus marked with reddish brown or dark brown; frons with 6–8 fuscous striae; vertex moderately infuscated except median stripe pale. **Rostrum:** length 2.79–2.86, reaching well beyond apices of hind coxae. **Antennae:** brown to black; I, length 1.44–1.51, with pale markings on dorsal aspect; II, length 2.75–2.95, with pale annulus medially; III, length 1.87–2.07; IV, length 1.21. **Pronotum:** mesal length 0.74–0.81, posterior width 1.33–1.53; disk brownish yellow or grayish yellow, sometimes with limited fuscous markings behind calli and along lateral margins; posterior submargin of disk with transverse fuscous line and 4–6 weakly elevated points; propleura fuscous, apical third pale, sometimes with incomplete pale line medially. **Scutellum:** dark brown with scattered pale spots; weakly convex. **Hemelytra:** grayish white, moderately tinged with brown, with darker fuscous markings mostly along veins, costal margin, inner margin of corium, and on cuneus; posterolateral angle of corium broadly infuscated; membrane densely conspurcate, outer margin with

two pale spots. **Legs:** femora white or pale yellow, reticulated with reddish brown or dark brown; dark markings on outer surface of front femora forming two parallel lines; hind femora extensively darkened and marked with pale spots; tibiae pale with reddish brown or fuscous markings, front pair with four dark annuli including narrow band at base. **Vestiture:** dorsum with black simple setae, narrow, black scalelike setae, and silvery white, sericeous setae. **Genitalia:** Figure 234. Left genital tubercle broad, ridgelike (fig. 234a).

Female. Unknown.

ETYMOLOGY: Named for the county in Arizona where the majority of paratypes were collected; a noun in apposition.

DISCUSSION: *Phytocoris yavapai* has been collected in Coconino, Maricopa, and Yavapai counties in Arizona. The male holotype was taken on *Quercus turbinella* Greene and one male paratype from Yarnell, Yavapai Co., is reported from *Ceanothus* sp. Collection dates are from June 2 to July 29.

Phytocoris yuma Knight

Figures 235, 236z

Phytocoris yuma Knight, 1961: 479, 480, fig. 2; 1968: 250, fig. 308.

TYPES: Described from 12 males collected at light in Yuma Co., Arizona, 4 November 1939, L. L. Stitt. The holotype and eight paratypes are retained in the Knight Collection (USNM). Three paratypes were not located.

DIAGNOSIS: Length 5.7–6.5. *Phytocoris yuma* is distinguished from other species of the *rostratus* group by the following combination of characters: hemelytra pale grayish yellow with brown to fuscous markings; scutellum usually with pale median line; ratio of eye length to width of vertex greater than 1.15:1 for males; second antennal segment with pale annulus medially; pale annuli on front tibiae much broader than dark annuli; and genital capsule with small ridgelike protuberance above base of left paramere (fig. 235a).

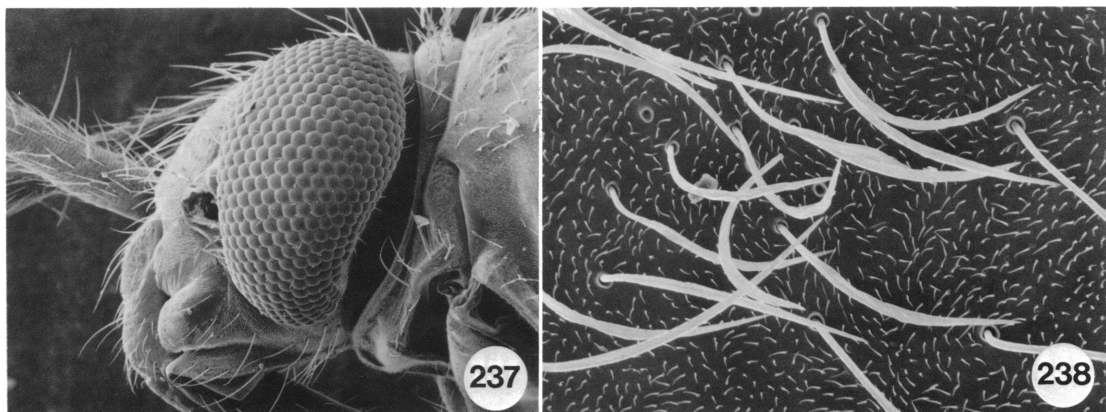
DISCUSSION: *Phytocoris yuma* is known only from Yuma Co., Arizona, and Imperial Co., California. I have examined 22 male specimens with collection dates from April 2 to November 4; all taken at light. The female and host plant association are not known.

STELLATUS SPECIES-GROUP

DIAGNOSIS: Recognized by the brown or brownish yellow general coloration, sometimes with red or reddish brown markings; short head (fig. 237); length of antennal segment I equal to or less than width of head across eyes; dorsum without scalelike setae; and male genitalia with the following characteristics: genital capsule without tubercles above paramere bases; sensory lobe of left paramere weakly produced; primary membranous sac of vesica unilobed; and sclerotized process with 2–7 marginal serrations.

DESCRIPTION: Moderate size, 4.6–7.4, brown or brownish yellow species with limited to extensive red or reddish brown markings; vestiture of dorsum with suberect, simple setae and silvery white, sericeous setae, the latter sometimes grouped in clusters. **Head:** short, frons in lateral view scarcely produced anteriorly of antennal fossae; antennae dark brown or black, segment II some-

times brown or yellowish brown; segment I pale on ventral surface, dorsal aspect with scattered pale maculae; length of segment I equal to or less than width of head across eyes, sometimes slightly longer in females of *angusticollis*; frons weakly convex, with 4–6 dark striae laterally; tylus weakly produced basally, junction with frons shallowly depressed; eyes obovate, occupying about five-sixths of height of head in lateral view. **Pronotum:** posterior submargin of disk with transverse fuscous line or series of dark spots; propleura fuscous, apical third pale. **Hemelytra:** white or pale yellow, slightly translucent ground color, with limited to extensive red, brown, or fuscous markings; corium sometimes with large pale patch medially and before apex; membrane mottled or uniformly suffused with pale fuscous. **Legs:** femora pale yellow with red to fuscous markings mostly on apical half; hind femora with reticulate



Figs. 237, 238. *Phytocoris stellatus*. **237.** Lateral view of head. **238.** Sericeous setae of dorsal vestiture.

pattern, or extensively darkened and marked with pale spots; tibiae pale with red to fuscous markings, sometimes with two or three dark annuli. **Male genitalia:** genital capsule without tubercles above paramere bases. *Left paramere:* sensory lobe weakly produced; shaft short, distal region, except *angusticollis*, flattened laterally and with dorsal margin strongly reflexed; apex narrowly produced, acute. *Right paramere:* narrowly to broadly lanceolate; apex acute. *Vesica:* primary membranous sac unilobed, elongate, rarely with lobal sclerite apically; basal lobes small, right lobe weakly sclerotized in part; basal process moderately to heavily sclerotized, extending above level of gonopore, expanded apically, joined to base of sclerotized process by narrow membranous region; sclerotized process with 2–7 toothlike serrations distally; ductus seminis narrow, not or slightly expanded distally.

DISCUSSION: The *stellatus* group comprises five species, all of which are distributed in mountainous regions of southeastern Arizona and western New Mexico except *stellatus*, which is widely distributed in western North America. *Phytocoris atriscutum* also is known from Sonora, Mexico. These species appear to be restricted to coniferous host plants, but detailed records are available only for *stellatus*.

Stellatus group species are closely allied to members of Knight's eastern group III (see Knight, 1941), but are distinguished by the shape of the genital parameres and the fewer number of teeth on the sclerotized process of

the vesica. The species of these two groups are strikingly similar in external appearance. *Stellatus* group species also share many characters with species of the *interspersus* group, but are easily distinguished by the darker general coloration, absence of dark spots on the apex of the scutellum, and by the structure of the male genitalia.

KEY TO SPECIES OF THE *STELLATUS* GROUP

- 1 Clavus and corium distinctly marked or tinged with red or brownish red; femora with red or reddish brown markings; sclerotized process of vesica with two strong serrations apically (figs. 242e, 243e) . . . 2
- Clavus and corium with brown or dark brown markings; femora marked with brown or fuscous; sclerotized process of vesica with 3–7 marginal serrations (figs. 239e, 240e, 241e) 3
- 2(1) Ratio of length of antennal segment I to width of head across eyes from 0.85:1 to 0.93:1; posterior lobe of pronotal disk uniformly tinged with brown, posterior margin narrowly pale; veins of hemelytral membrane yellowish brown or slightly paler distally; male genitalia as in figure 242
. *huachuca* n. sp.
- Ratio of length of antennal segment I to width of head across eyes from 0.60:1 to 0.80:1; posterior lobe of pronotal disk mottled with reddish brown or fuscous, leaving some areas pale especially medially; veins of hemelytral membrane red or tinged with red; male genitalia as in figure 243
. *stellatus* Van D.
- 3(1) Ratio of length of antennal segment I to width

of head across eyes from 0.74:1 to 0.82:1; scutellum fuscous, pale only at extreme apex; sclerotized process of vesica with six or seven serrations distally (fig. 241e); body length 4.18–4.30 *atriscutum* n. sp.

Ratio of length of antennal segment I to width of head across eyes from 0.85:1 to 1.10:1; scutellum with pale markings laterally and dorsomedially, more broadly pale apically; sclerotized process of vesica with three or four serrations distally (figs. 239e, 240e); body length 5.45–7.40 4

- 4(3) Scutellum with pale median line, basal angles broadly pale; inner margin and apex of cuneus marked with red or reddish brown; hind femora without pale band distally; male genitalia as in figure 240; body length 6.40–7.40 *angusticollis* Knight

Scutellum without pale median line, basal angles darkened or narrowly pale; cuneus without red markings; hind femora with pale band distally; male genitalia as in figure 239; body length 5.45–5.89

. *alpestris* n. sp.

***Phytocoris alpestris*, new species**

Figure 239

HOLOTYPE MALE: Chiricahua Mts., trail from Rustler Pk. to Fly Peak, 2440–2740 m, Cochise Co., Arizona, 31 August 1976, J. D. Pinto (UCR; donated to the AMNH).

PARATYPES: 1 male, same data as holotype (UCR).

DIAGNOSIS: Recognized by the brown general coloration without red markings; ratio of length of antennal segment I to width of head across eyes from 0.89:1 to 0.96:1; scutellum with limited pale markings anterolaterally and dorsally, apex broadly pale; hind femora with pale band distally; shaft of left paramere short, broadly expanded distally (fig. 239c); and sclerotized process of vesica with three strong serrations (fig. 239e).

DESCRIPTION: *Male.* Length 5.45–5.89, width 1.76; dark brown general coloration. **Head:** width across eyes 0.89–0.92, vertex 0.21–0.23; brownish yellow with fuscous markings; frons weakly convex, meeting tylus along shallow depression, with 4–6 dark striae laterally; vertex narrow, lightly tinged with red. **Rostrum:** length 1.94–2.03, reaching fifth abdominal segment. **Antennae:** dark brown to nearly black; I, length 0.79–0.88, dorsal aspect with large pale spots, ventral surface mostly pale; II, length 2.09–2.34, base nar-

rowly pale; III, length 1.10–1.30, with pale annulus at base and apex; IV, length 0.72–0.79. **Pronotum:** mesal length 0.70–0.74, posterior width 1.33–1.37; disk pale yellow, extensively tinged with brown, posterior submargin and region behind calli marked with darker brown, extreme posterior margin narrowly pale; collar and calli pale yellow, lightly marked with reddish brown or fuscous; propleura brown to fuscous, apical third pale. **Scutellum:** extensively darkened with brown to fuscous, apex broadly pale, lateral margins and dorsal surface with pale markings. **Hemelytra:** translucent grayish white, extensively mottled with brown to fuscous and with scattered pale spots especially on embolium and cuneus; corium with large pale patch medially and before apex; anterior third of cuneus pale yellow with reddish brown or fuscous reticulations, distal two-thirds more extensively darkened; membrane with dusky patches. **Legs:** femora pale yellow with fuscous markings mostly on apical half; distal two-thirds of hind femora reticulated with fuscous, dark regions broken by pale spots, spots coalescing preapically forming pale band; tibiae pale with two or three fuscous annuli, dark bands marked with pale spots. **Vestiture:** dorsum with stout, black, simple setae and white, sericeous setae; sericeous setae mostly clumped. **Genitalia:** Figure 239.

Female. Unknown.

ETYMOLOGY: From the Latin, *alpestris* (of high mountains), referring to the occurrence of the species at high elevations.

DISCUSSION: *Phytocoris alpestris* is known only from the type and single paratype collected in the Chiricahua Mts., Cochise Co., Arizona. The host plant is not known, but I suspect that this species inhabits a conifer, most likely a member of the genus *Pinus*. Additional collecting should extend the known distribution of *alpestris* in Arizona and possibly into western New Mexico and northern Mexico.

***Phytocoris angusticollis* Knight**

Figure 240

Phytocoris angusticollis Knight, 1925a: 57, 58. – Carvalho, 1959: 190. – Knight, 1968: 235.

TYPES: Described from a single male collected on Mt. Lemon, Santa Catalina Mts., Pima Co., Arizona, 27 July 1917, H. H.

Knight. The holotype is retained in the Knight Collection (USNM).

DIAGNOSIS: Length 6.4–7.4. *Phytocoris angusticollis* is distinguished from other species of the *stellatus* group by the following combination of characters: ratio of length of antennal segment I to width of head across eyes from 0.85:1 to 1.10:1; clavus and corium with brown to fuscous markings; basal angles and apex of scutellum broadly pale, narrow median line also pale; inner margin and apex of cuneus marked with red or reddish brown; hind femora without pale band distally; primary membranous sac of vesica with large lobal sclerite apically; sclerotized process of vesica with three or four serrations distally (fig. 240e).

DISCUSSION: This species is distributed in mountainous regions of central and southeastern Arizona and western New Mexico. I have examined 39 specimens from Catron Co., New Mexico, and the following counties in Arizona: Apache, Coconino, Graham, Pima. Most of this material was taken at elevations between 2135 and 2745 m. Several specimens were collected on *Pseudotsuga menziesii* (Mirb.) Franco. The range of occurrence is from June 22 to August 22.

***Phytocoris atriscutum*, new species**

Figure 241

HOLOTYPE MALE: 6 mi W of Yecora, Sonora, Mexico, 25 April 1982, D. A. and J. T. Polhemus (USNM).

PARATYPES: USA. ARIZONA. Santa Cruz Co.: 1 female, Atascosa Mt., 16 August 1937, E. D. Ball (USNM).

DIAGNOSIS: Recognized by the small size, length 4.18–4.30; dark brown general coloration; uniformly fuscous scutellum with apex narrowly pale; ratio of length of antennal segment I to width of head across eyes from 0.74:1 (holotype) to 0.82:1 (female paratype); and structure of the male genitalia, most notably the sclerotized process of the vesica with six or seven serrations distally (fig. 241e).

DESCRIPTION: *Male holotype.* Length 4.30, width 1.50; dark brown general coloration. **Head:** width across eyes 0.84, vertex 0.19; grayish white with fuscous markings on lateral margins of tylus, dorsal margin of jugum, and borders of antennal fossae; vertex with large fuscous spot either side of middle bor-

dering posterior margin of eye; frons with several fuscous striae laterally; frons and tylus also with faint reddish markings mostly medially; lorum, buccula, and gena mostly fuscous. **Rostrum:** length 1.78, reaching well beyond apices of hind coxae. **Antennae:** I, length 0.62, fuscous with pale spots dorsally and laterally, ventral surface grayish white; II, length 1.81, black; III, length 0.76, black; IV, missing. **Pronotum:** mesal length 0.54, posterior width 1.12; grayish white; posterior margin of disk with broad, fuscous band medially, extending laterally to slightly beyond level of anterior angles of scutellum; collar fuscous; calli and especially disk bordering calli marked with fuscous; propleura fuscous, apex narrowly pale. **Scutellum:** uniformly fuscous, apex narrowly pale. **Hemelytra:** brownish gray, extensively darkened with fuscous, especially on clavus and cuneus; middle and apex of corium, and embolium with paler gray patches; cuneus tinged with red, anteromedial angle with shiny white spot; membrane including veins lightly tinged with brown. **Legs:** femora grayish white with fuscous markings mostly on distal half; hind femora extensively darkened and marked with pale spots; tibiae pale with four fuscous annuli including narrow basal band, banding less distinct on hind tibiae. **Vestiture:** as noted in group description. **Genitalia:** Figure 241.

Female. Similar to male in color, vestiture, and structure except vertex noticeably broader, calli with limited reddish markings, and collar reddish brown with pale section medially. Length 4.18, width 1.45. **Head:** width across eyes 0.80, vertex 0.28. **Rostrum:** length 1.77, reaching base of ovipositor. **Antennae:** I, 0.66; II, 1.81; III, 0.81; IV, missing. **Pronotum:** mesal length 0.60, posterior width 1.16.

ETYMOLOGY: From the Latin, *atrum* (black) and *scutum* (shield), referring to the uniformly fuscous scutellum.

DISCUSSION: *Phytocoris atriscutum* is known only from the type material collected in southwestern Arizona and Sonora, Mexico. The host plant association is not known.

***Phytocoris huachuca*, new species**

Figure 242

HOLOTYPE MALE: Santa Rita Mts. [Pima Co.–Santa Cruz Co.], Arizona, 26 September 1925, A. A. Nichol (USNM).

PARATYPES: ARIZONA. **Cochise Co.:** 1 male (teneral), Huachuca, 13 September 1935, E. D. Ball (USNM); 1 female, Huachuca Mts., 1830 m, 14 June 1928, A. A. Nichol (USNM); 1 female, Huachuca Mts., 10 July 1905 (AMNH).

DIAGNOSIS: Very similar to *stellatus*, but distinguished by the uniformly darkened posterior lobe of the pronotal disk, posterior margin narrowly pale; slightly longer first antennal segment, ratio of segment length to width of head across eyes from 0.85:1 to 0.93:1, veins of hemelytral membrane yellowish brown, not marked with red; and structure of the male genitalia, especially the more strongly produced sensory lobe of the left paramere (fig. 242b).

DESCRIPTION: *Male.* Length 4.70–4.88, width 1.55–1.60; brownish yellow general coloration with red markings. **Head:** width across eyes 0.83–0.86, vertex 0.23–0.24; pale yellow with red markings on vertex, frons, tylus, and buccula; frons with six reddish striae laterally; jugum and lorum mostly red. **Rostrum:** length 1.66–1.74, reaching apices of hind coxae. **Antennae:** I, length 0.71, brownish red with white maculae dorsally and laterally, ventral surface mostly pale; II, length 1.78, yellowish brown; III and IV, missing (see female description). **Pronotum:** median length 0.66–0.71, posterior width 1.24–1.35; disk mostly brown, posterior submargin tinged with red, extreme posterior margin narrowly pale; collar and calli lighter yellow with limited red markings; propleura yellowish brown, tinged with red medially, apical third pale. **Scutellum:** grayish white with faint brownish tinge, distal half with scattered red flecks. **Hemelytra:** pale brownish- or grayish yellow; portions of clavus and corium lightly tinged with red; embolium, inner distal margin of corium, and cuneus more intensely marked with red; anteromedial angle and apex of cuneus narrowly white; membrane faintly mottled with brown, veins brown, pale distally. **Legs:** femora pale brownish yellow, reticulated with red or brownish red mostly on distal half; hind femora extensively reddened and marked with pale spots; tibiae pale brownish yellow, lightly to moderately marked with red or reddish brown, without distinct annuli. **Vestiture:** as noted in group description; simple setae on pronotum brown

or black, those on scutellum and hemelytra mostly golden. **Genitalia:** Figure 242.

Female. Similar to male in color, vestiture, and structure except vertex noticeably broader and rostrum somewhat longer. Length 4.65–4.68, width 1.69–1.72. **Head:** width across eyes 0.83, vertex 0.31–0.34. **Rostrum:** length 1.87–1.90, reaching slightly beyond apices of hind coxae. **Antennae:** I, 0.75–0.77; II, 1.72–1.80; III, 1.06–1.17, brown or yellowish brown; IV, 0.72, brown. **Pronotum:** mesal length 0.68–0.70, posterior width 1.34.

ETYMOLOGY: Named for the Huachuca Mts. in southeastern Arizona; a noun in apposition.

DISCUSSION: *Phytocoris huachuca* is known only from the Huachuca and Santa Rita mountains in southeastern Arizona. The host plant association is not known.

Phytocoris stellatus Van Duzee

Figure 237, 238, 243

Phytocoris stellatus Van Duzee, 1920: 350, 351. – Downes, 1924: 29. – Carvalho, 1959: 217. – Knight, 1968: 225, fig. 272. – Kelton, 1980: 171, fig. 119, map 51.

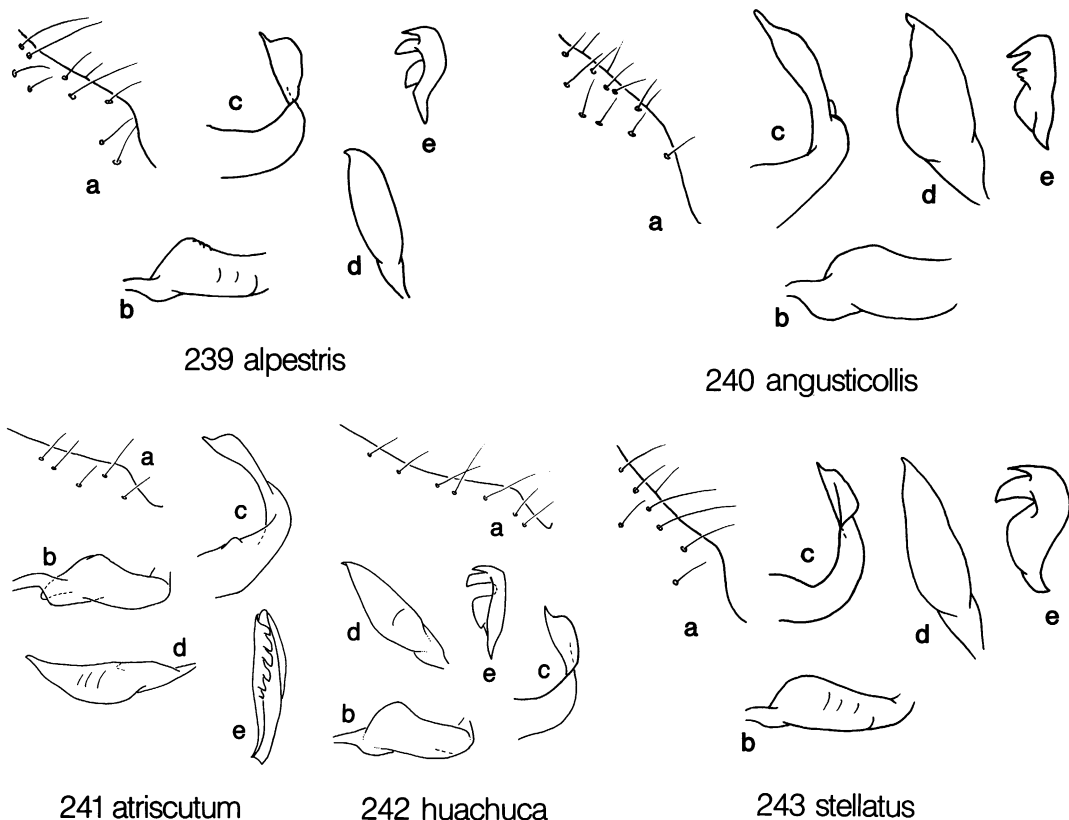
Phytocoris tinctus Knight, 1928: 36, 37. – Carvalho, 1959: 219. – Knight, 1968: 225. NEW SYNONYMY.

Phytocoris arcatae Bliven, 1959: 31, 32. NEW SYNONYMY.

TYPES: *Phytocoris stellatus* was described from three specimens collected at Carmel, Monterey Co., California, 24 March 1919, taken on pines, E. P. Van Duzee. The male holotype (no. 703), allotype (no. 704), and single female paratype are retained in the Van Duzee Collection (CAS).

The junior synonym, *tinctus*, was described from 11 specimens taken in Colorado and Arizona. The male holotype, allotype, and four male paratypes were collected at Stonewall, 2590 m, Las Animas Co., Colorado, 7 August 1925, ex. *Pinus edulis* Engelm., H. H. Knight. All type material is deposited in the Knight Collection (USNM); five paratypes were not located.

The junior synonym, *arcatae*, was described from 28 specimens collected at Samoa, Humboldt Co., California, ex. *Pinus contorta* Dougl., B. P. Bliven: male holotype, 4 September 1938; allotype, 8 September 1946; one paratype, 30 August 1936; 23 para-



Figs. 239–243. Male genitalia of *stellatus* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

types, 4 and 18 September 1938; two paratypes, 8 September 1946. All type material is deposited in the collection of the CAS.

DIAGNOSIS: Length 4.6–7.0. Recognized by the reddish orange to reddish brown hemelytra with red areolar veins; posterior lobe of pronotal disk mottled with reddish brown or fuscous, leaving at least limited areas pale; ratio of length of antennal segment I to width of head across eyes from 0.60:1 to 0.80:1; shaft of left paramere noticeably expanded distally (fig. 243c); and sclerotized process of vesica with two strong serrations apically (fig. 243e).

DISCUSSION: *Phytocoris stellatus* is widely distributed in western North America. Specimens have been collected along the Pacific Coast from San Luis Obispo Co., California to Vancouver Island, British Columbia. The distribution extends inland to the Sierra Ne-

vada Mts., Cascade Range, and Blue Mts. of northeastern Oregon, and east across northern Washington, Idaho, and southern British Columbia to the Rocky Mts. In the Rocky Mt. states, *stellatus* has been collected from Glacier Nat. Pk. in Montana south to Cloudcroft, Otero Co., New Mexico. This species also occurs in the central and southeastern mountain ranges of Arizona, the northern Wasatch Plateau and Uinta Mts. of Utah, and the north-south mountain ranges of central Nevada. Several specimens also were seen from Cheyenne Co., Kansas. Kelton (1980) reported *stellatus* from the southwestern corner of Alberta, Canada.

Phytocoris stellatus has been collected from a number of *Pinus* species. It is most commonly taken on beach or lodgepole pine, *P. contorta* Dougl., but also inhabits *P. muricata* D. Don. and *P. radiata* D. Don. in Cal-

ifornia, *P. flexilis* James. in Nevada, *P. aristata* Engelm. in Colorado and Nevada, and *P. edulis* Engelm. in Arizona and Colorado. Both sexes have been collected at light. I have examined 755 specimens with collection dates from June 17 to September 23. In southern coastal California, adults of *stellatus* have been collected year round.

I have examined the holotype specimens of *arcatae* and *tinctus* and they are conspecific with *stellatus*. The general coloration of the type and paratypes of *tinctus* is noticeably lighter than for *stellatus*, but other external features of these specimens are typical of *stellatus*. Knight (1928) stated that *tinctus* differs from *stellatus* in the form of the male genital parameres, but I found the genitalia of these

taxa to be nearly identical. The junior synonym, *arcatae*, is similar in all aspects to *stellatus*, including general coloration and structure of the male genitalia. The difference in size between the sexes (males with longer hemelytra) that was noted by Bliven (1959) is typical of *stellatus* across its entire distribution. Bliven also stated that *arcatae* has a different period of adult emergence than *stellatus*, apparently not realizing that *stellatus* has at least two generations a year throughout much of California. The differences in form of the male genital parameres, reported without detail by Bliven, were not apparent in the material I examined. On the basis of the above information, I am placing *tinctus* and *arcatae* in synonymy with *stellatus*.

TENUIS SPECIES-GROUP

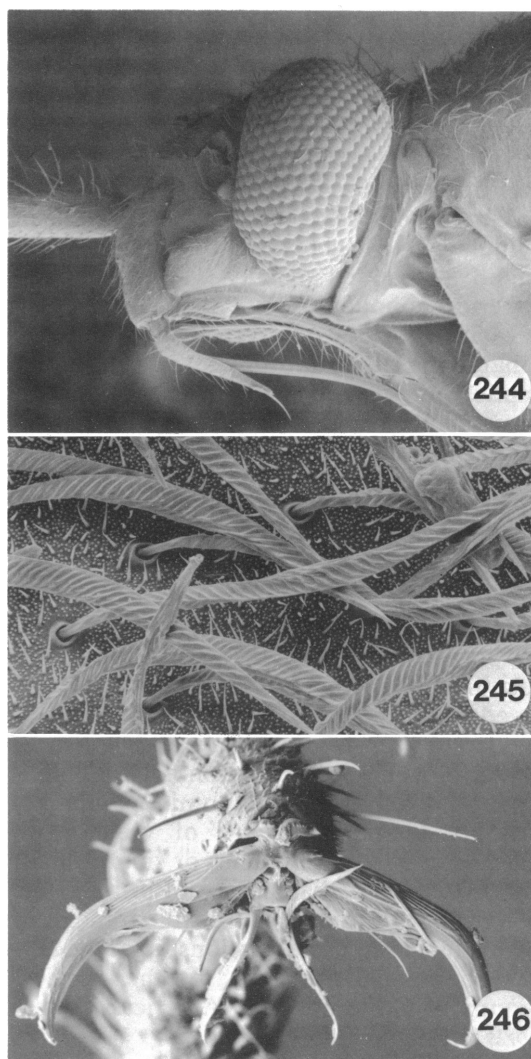
DIAGNOSIS: Recognized by the brown or grayish brown general coloration; dorsal vestiture without generally distributed scalelike setae; eyes occupying two-thirds to five-sixths of height of head in lateral view (fig. 244); narrow vertex; antennal segment II without pale annulus medially; posterior submargin of pronotal disk with fuscous band or series of dark patches; basal half of propleura with distinct pale regions(s); fore tibiae usually with three or four dark annuli; and male genitalia with the following features: genital capsule, except *canescens*, without distinct tubercles above paramere bases; primary membranous sac of vesica unilobed, or weakly bi- or trilobed, sometimes with small lobal sclerite originating from right distal region; left inner-basal region of primary membranous sac sclerotized in part, sclerotization sometimes reaching near apex of sac (fig. 6); basal lobes of vesica strongly developed, left lobe usually with compact to fairly dispersed patch of spinulae (fig. 6).

DESCRIPTION: Moderate size, 5.0–7.8, brown or grayish brown species, rarely with limited red markings; vestiture of dorsum with silvery white or golden, sericeous setae and golden brown to dark brown, simple setae, sometimes with scattered, dark, sericeous setae mostly restricted to posterior third of corium. **Head:** short in lateral view, frons only slightly protruding anteriad of antennal fossae; antennae yellowish brown to dark

brown; segment I pale with reddish brown to fuscous reticulations or maculae and pale bristlelike setae dorsally and laterally, ventral surface mostly pale, length subequal to or slightly greater than posterior width of pronotum; segment II sometimes paler medially but without distinct pale annulus, except see *histriculus* description; frons moderately convex anteriorly, meeting tylus along shallow depression, marked with 6–8 reddish brown or fuscous striae laterally; tylus moderately to strongly produced basally; eyes obovate, occupying two-thirds to five-sixths of height of head in lateral view. **Pronotum:** disk brownish yellow or grayish yellow, lightly to moderately marked with brown or fuscous, posterior submargin with fuscous band or series of dark patches, and 4–6 weakly elevated, tumid points; calli weakly elevated, narrowly separated medially; propleura pale, dorsal half moderately to extensively darkened. **Hemelytra:** grayish white or pale brownish yellow, moderately to extensively mottled with brown or dark brown spots and larger maculae; sometimes more uniformly darkened along veins, inner margin of cuneus, and on anterior third and inner posterior region of corium, rarely tinged with red (see *maritimus* description); membrane conspurcate, veins brown or yellowish brown, sometimes tinged with red. **Legs:** femora white or pale yellow with reddish brown to fuscous markings or reticulations mostly on distal half; hind fem-

ora sometimes more extensively darkened and marked with pale spots; tibiae pale with three or four dark annuli, basal one or two bands sometimes obscured; banding less distinct on hind tibiae. **Male genitalia:** genital capsule, except *canescens*, without distinct tubercles above paramere bases, sometimes broadly swollen or with low rounded protuberance. *Left paramere:* sensory lobe moderately produced, *tenuis* with large, laterally flattened dorsal process; shaft slightly expanded distally in dorsal view, more broadly expanded for *insulatus*; apex narrowly flattened laterally. *Right paramere:* elongate; dorsal margin somewhat arcuate; apex acute. *Vesica:* primary membranous sac well developed, unilobed or weakly bi- or trilobed, sometimes with small lobal sclerite or field of small tubercles; left inner-basal region of primary membranous sac sclerotized in part, sclerotization usually situated directly behind sclerotized process, sometimes reaching near apex of sac; basal lobes of vesica strongly developed, left lobe usually with compact to fairly dispersed patch of spinulae; basal process well developed; sclerotized process a simple elongate sclerite, sometimes with one or two tiny serrations apically, or more compact with two or three strong, spinelike marginal serrations; ductus seminis slightly to strongly expanded distally; gonopore small, subspherical or larger and somewhat heart-shaped.

DISCUSSION: The *tenuis* group comprises six species, one of which is widely distributed in the western United States and the others with distributions restricted to coastal California. The widespread species was treated as two distinct taxa, *gracillatus* and *tenuis*, by Stonedahl (1983b), where they were recognized as the only members of the *gracillatus* species-group. Recently examined material from the type locality of *tenuis* and other nearby areas has confirmed an earlier suspicion that *gracillatus* is conspecific with *tenuis*. The species-group name is here established as *tenuis* following the newly recognized synonymy of *gracillatus*. Three other members of the *tenuis* group, *canescens*, *histriculus*, and *maritimus*, were treated as unplaced species by Stonedahl (1983b) and two species, *insulatus* and *leucophaeus* are described here as new. The defining characters



Figs. 244–246. *Phytocoris tenuis*. 244. Lateral view of head. 245. Sericeous setae of dorsal vestiture. 246. Pretarsus.

of the *tenuis* group are given in the generic diagnosis.

Two subgroups can be recognized in the *tenuis* species-group based on characters of the male genitalia. One subgroup including *histriculus*, *insulatus*, and *tenuis* is recognized by the unilobed or weakly bilobed primary membranous sac of the vesica, right lobe or right distal margin of sac without apical sclerite; left basal lobe of vesica with patch of well separated spinulae, or weakly sclerotized re-

gion lacking distinct spinulae; and ductus seminis strongly expanded distally with large, heart-shaped gonopore. The other subgroup comprises *canescens*, *leucophaeus*, and *maritimus* and is recognized by the weakly trilobed primary membranous sac of vesica with sclerotized region at apex of right lobe; left basal lobe of vesica with compact patch of spinulae; and ductus seminis not or only slightly expanded distally with small subspherical gonopore.

Members of the *tenuis* group are primarily inhabitants of shrubby plants, with the exception of *maritimus* which occurs on *Cupressus* and *Sequoia*. The host plant association of *leucophaeus* is not known.

The *tenuis* species-group is the sister-group of a large complex of species (i.e., *fraterculus* + *aurora* + *conspurcatus* + *juniperanus* groups) defined by the presence of two types of strongly asymmetrical, broad, scalelike setae on the dorsum (see pertinent group descriptions for further detail). This sister-group relationship is supported by the following derived features: (1) short head with weakly to moderately protruding frons and tylus; (2) posterior submargin of pronotal disk with several weakly elevated, tumid points; (3) primary membranous sac of vesica with patches or rows of tubercles or small spines; and (4) inner-medial surface of primary sac of vesica with broadly attached, straplike or platelike sclerite. The relationship of the *tenuis* group and its relatives to other species-groups of western North American *Phytocoris* is not well understood.

KEY TO SPECIES OF
THE *TENUIS* GROUP

- 1 Sensory lobe strongly produced dorsally, laterally flattened, abruptly curved distally, appearing C-shaped in lateral view (fig. 252b, c) *tenuis* Van D.
- Sensory lobe normally developed 2
- 2(1) Genital capsule with prominent tubercle above base of left paramere (fig. 247a); sclerotized process of vesica as in figure 247e *canescens* Reuter
- Genital capsule sometimes broadly swollen above base of left paramere (fig. 249a) or with low rounded protuberance (fig. 248a), but lacking prominent, upright tubercle 3
- 3(2) Sclerotized process of vesica with three strong,

- spinelike serrations (figs. 248e, 249e); ductus seminis strongly expanded distally, gonopore somewhat heart-shaped 4
- Sclerotized process of vesica without marginal serrations or rarely with one or two fine teeth at extreme apex (figs. 250e, 251e); ductus seminis not or only weakly expanded distally, gonopore subspherical 5
- 4(3) Shaft of left paramere strongly expanded distally in dorsal view (fig. 249c); genital capsule broadly swollen above base of left paramere (fig. 249a); sclerotized process of vesica as in figure 249e .. *insulatus* n. sp.
- Shaft of left paramere weakly expanded distally in dorsal view (fig. 248c); genital capsule with low, rounded protuberance above base of left paramere (fig. 248a); sclerotized process of vesica as in figure 248e *histriculus* Van D.
- 5(3) Posterior submargin of pronotal disk with six fuscous patches; scutellum moderately to extensively darkened with fuscous medially; clavus mottled with brown or fuscous especially along vein; genitalia as in figure 250 *leucophaeus* n. sp.
- Posterior submargin of pronotal disk with complete fuscous band; scutellum and clavus without fuscous markings, except scutellum usually with dark spot either side before apex; genitalia as in figure 251 ... *maritimus* Van D.

Phytocoris canescens Reuter
Figure 247

Phytocoris canescens Reuter, 1909: 30. – Van Duzee, 1914: 19; 1917a: 316; 1917b: 262; 1918: 285. – Carvalho, 1959: 193. – Knight, 1968: 223. – Henry and Stonedahl, 1983: 447, 448.

TYPES: Described from an undesigned number of specimens collected at Claremont, Los Angeles Co., California, by D. Baker. I have examined eight specimens that appear to be from the original type series: one male with abdomen missing (ZMH); three males, one female (CAS); one male, one female (Knight Collection, USNM); one male (LACM). The male specimen from the Knight Collection was designated a lectotype by Henry and Stonedahl (1983).

DIAGNOSIS: Recognized by the long first antennal segment with dark markings ventrally as well as dorsally and laterally, length of segment greater than posterior width of pronotum; hemelytra with dark spots at bases

of simple setae; female strongly brachypterous; male genital capsule with prominent tubercle above base of left paramere (fig. 247a); and vesica with compact patch of spinulae on left basal lobe and distinct sclerotized process (fig. 247e). The primary membranous sac of the vesica is trilobed; right lobe with rounded sclerite apically; right margin of medial lobe sclerotized to near apex.

REDESCRIPTION: Length: male 5.1–7.0, macropterous; female 3.9–4.9, strongly brachypterous. **Head:** white or pale yellow; base of buccula, jugum, lorum, and tylus marked with fuscous; frons moderately convex, with six or seven fuscous striae laterally; eyes occupying three-fourths of height of head in lateral view. **Antennae:** I, white with numerous brown to fuscous spots; II, yellowish brown with narrow pale annulus at base; III and IV, yellowish brown to dark brown. **Pronotum:** disk grayish white or pale brownish yellow with fuscous spots, posterior submargin with 4–6 slightly elevated fuscous points; collar and calli usually marked with fuscous; propleura pale with fuscous medial stripe. **Scutellum:** brownish yellow with fuscous bordering narrow, median line; lateral margins usually with dark spot before apex. **Hemelytra:** grayish white or pale brownish yellow, with fuscous spots at bases of simple setae; darker specimens tinged with fuscous and sometimes with outer half of clavus, inner apical region and outer apical angle of corium, and apex of cuneus more extensively darkened; membrane moderately to densely conspurcate. **Legs:** femora white or pale grayish yellow with brown to fuscous reticulations; hind femora extensively darkened and marked with pale spots; tibiae pale with brown to fuscous markings; front tibiae usually with four dark annuli including narrow basal band; dark annuli sometimes faint or obsolete. **Vestiture:** as noted in group description, distal third of corium sometimes with limited dark, sericeous setae. **Male genitalia:** Figure 247. Genital capsule with prominent tubercle above base of left paramere.

DISCUSSION: *Phytocoris canescens* is widely distributed in the chaparral region of California from the San Francisco Bay area south to San Diego County. This species also occurs along the northern coast of California from Humboldt County to Marin County. Adult

specimens have been collected from a variety of shrubby plants including *Artemisia californica* Less., *A. douglasiana* Bess., *Baccharis pilularis* DC., *Eriogonum fasciculatum* Benth., *Haplopappus propinquus* Blake., *Mimulus longiflorus* (Nutt.) Grant., and *Salvia mellifera* Greene. Males have been taken at light. I have examined 250 specimens with collection dates from all months of the year.

Phytocoris histriculus Van Duzee

Figure 248

Phytocoris histriculus Van Duzee, 1920: 346, 347.
– Carvalho, 1959: 201. – Knight, 1968: 249.

TYPES: Described from 10 specimens collected by E. P. Van Duzee at La Jolla, 4 July 1914 and Sweetwater Valley, nr. Alpine, 18 June 1913, San Diego Co., California. The male holotype (no. 715), allotype (no. 716), and six paratypes are retained in the Van Duzee Collection (CAS). The remaining two paratypes are deposited in the Knight Collection (USNM).

Two of the *histriculus* paratypes are not conspecific with the holotype. A teneral, male specimen at the USNM with label data, "San Diego Co., Cal., 7-4-14, E. P. Van Duzee" is identified as *californicus*; a female specimen at the CAS with the same label data except "6-18-13" is placed in the *conspurcatus* group. The latter specimen could not be identified to the species level.

DIAGNOSIS: Similar to *insulatus* in external appearance and structure of the male genitalia but distinguished by the shorter first antennal segment, length less than (males) or equal to (females) posterior width of pronotum; genital capsule of male with low rounded protuberance above base of left paramere (fig. 248a); shaft of left paramere weakly expanded distally (fig. 248c); and sclerotized process of vesica with less prominent spine-like serrations (fig. 248e).

REDESCRIPTION: Length 5.0–6.3; light brown general coloration. **Head:** pale yellow with reddish brown or fuscous markings; frons with five or six dark striae laterally. **Antennae:** I, pale with reddish brown or fuscous markings dorsally and laterally; II, brown or yellowish brown, with pale annulus basally and broader, less distinct band medially; III, brown to fuscous with paler region medially;

IV, brown to fuscous. **Pronotum:** disk pale yellow, extensively tinged with fuscous, posterior submargin with 4–6 slightly elevated fuscous points, extreme posterior margin pale; collar and calli lighter yellow with reddish brown or fuscous markings; propleura pale, dorsal margin and median line fuscous. **Scutellum:** pale with fuscous markings, and dark spot distolaterally. **Hemelytra:** grayish white or pale grayish yellow with fuscous markings, sometimes with faint pinkish tinge; corium usually with distinct pale region medially and at apex, apical pale region usually preceded by angular fuscous patch; membrane mottled with fuscous spots and larger maculae. **Legs:** femora white or pale yellow with limited reddish brown or fuscous markings mostly on distal half; hind femora more extensively darkened distally and with pale preapical band, dark regions broken by pale spots; tibiae pale with fuscous markings, front and middle pair with three dark annuli. **Vestiture:** as noted in group description; distal third of corium sometimes with scattered, dark, sericeous setae. **Male genitalia:** Figure 248. Genital capsule with low rounded protuberance above base of left paramere.

DISCUSSION: In addition to the holotype and paratypes, four specimens were seen from the following localities: CALIFORNIA. San Diego Co. (CAS); San Clemente Is., nr. Mt. Thirst (UCR); Santa Cruz Is. (CAS). Collection dates are from May 17 to July 4. The male specimen from San Clemente Is. was collected on *Quercus*.

Phytocoris insulatus, new species

Figures 6, 249

HOLOTYPE MALE: Middle Cyn., Santa Catalina Is., Los Angeles Co., California, 500–750 ft (150–230 m), 1 May 1978, ex. *Mimulus* sp., J. Doyen (UCB).

PARATYPES: CALIFORNIA. **Los Angeles Co.:** 1 male, same data as holotype except taken on *Heteromeles* (UCB); 1 female, same data as holotype except 75–150 m and no host data (UCB); 1 male, Pebbly Beach Cyn, Santa Catalina Is., 31 March 1968, J. Powell (UCB).

DIAGNOSIS: Recognized by the light brown general coloration; length of antennal seg-

ment I slightly greater than posterior width of pronotum; and structure of the male genitalia, especially the genital capsule broadly swollen above base of left paramere (fig. 249a), shaft of left paramere strongly expanded distally in dorsal view (fig. 249c), and sclerotized process of vesica with three strong, spinelike serrations (fig. 249e).

DESCRIPTION: *Male.* Length 6.65–7.05, width 1.88–2.05; grayish yellow ground color with brown markings. **Head:** width across eyes 0.92–1.00, vertex 0.31–0.36; pale yellow with reddish brown markings on vertex, frons, tylus, and dorsal margin of jugum and lorum. **Rostrum:** length 2.62–2.75, reaching fourth or fifth abdominal segment. **Antennae:** I, length 1.59–1.69, grayish white with brown maculae dorsally and laterally; II, length 2.85–3.05, yellowish brown, apex narrowly fuscous; III, length 1.33, brown or yellowish brown, slightly darker distally; IV, length 1.16, brown. **Pronotum:** mesal length 0.80–0.88, posterior width 1.41–1.54; disk brownish yellow, posterior submargin with fuscous band or series of dark patches; calli paler yellow with limited reddish brown markings; collar with broad reddish brown patch either side of pale median spot; propleura pale, dorsal margin brown or at least tinged with brown, sometimes also with reddish brown medial band or anteromedial stripe. **Scutellum:** grayish yellow, lightly to moderately tinged with brown dorsally; lateral margins with fuscous spot before apex. **Hemelytra:** grayish yellow, lightly tinged with brown; clavus and corium with scattered brown maculae especially along veins and embolium; cuneus more extensively darkened on inner margin and at apex; membrane conspurcate, veins tinged with red. **Legs:** femora grayish white or pale yellow with brown or reddish brown markings mostly on distal half; hind femora more extensively reticulated with brown; tibiae pale with fuscous markings; front and middle tibiae with four dark annuli including narrow, sometimes obscured, basal band; hind tibiae without dark bands. **Vestiture:** as noted in group description. **Genitalia:** Figure 249.

Female. Similar to male in color, vestiture, and structure except vertex broader and with slightly shortened hemelytral membrane. Length 6.25, width 2.00. **Head:** width across

eyes 0.98, vertex 0.41. **Rostrum:** length 2.82, reaching fifth abdominal segment. **Antennae:** I, 1.72; II, 2.85; III, 1.37; IV, missing. **Pronotum:** mesal length 0.82, posterior width 1.48.

ETYMOLOGY: From the Latin, *insulatus* (isolated), referring to the restricted occurrence of the species on Santa Catalina Island.

DISCUSSION: *Phytocoris insulatus* is known only from Santa Catalina Is. in the Gulf of Santa Catalina. The holotype was collected on *Mimulus* and one male paratype was taken on *Heteromeles*.

***Phytocoris leucophaeus*, new species**

Figure 250

HOLOTYPE MALE: Menifee Valley (hills at W end), 33°39'N 117°13'W, 1800 ft (550 m), Riverside Co., California, 31 March 1978, at white light, J. D. Pinto (UCR; donated to the AMNH).

PARATYPES: CALIFORNIA. **Riverside Co.:** 1 male, same data as holotype (UCR); 1 male, same data as holotype except 20 February 1982 (UCR). **San Diego Co.:** 1 male, 10 January 1913, E. P. Van Duzee (CAS); 1 male, Del Mar, L. T., 9–28 January 1958, A. A. Lee (SDNH).

DIAGNOSIS: Distinguished from other species of the *tenuis* group by the following characters of the male genitalia: genital capsule without tubercle or broadly swollen region above base of left paramere (fig. 250a); sclerotized process of vesica elongate, without strong marginal serrations (fig. 250e); primary membranous sac of vesica with lance-shaped lobal sclerite originating from right distal surface; left basal lobe of vesica with compact patch of spinulae on outer surface; ductus seminis uniformly narrow, not strongly expanded distally. Parameres as in figure 250b–d.

DESCRIPTION: *Male.* Length 6.65–7.05, width 1.92–2.00; grayish brown general coloration. **Head:** width across eyes 1.00–1.02, vertex 0.28–0.30; white or pale yellow with fuscous markings on vertex, frons, tylus, dorsal margin of jugum, and behind eyes; lorum mostly fuscous. **Rostrum:** length 2.50–2.60, reaching fourth abdominal segment. **Antennae:** I, length 1.38–1.48, white with large fuscous maculae dorsally and laterally, ventral

surface pale, narrowly fuscous basally; II, length 2.75–3.05, brown or dark yellowish brown; III, length 1.35–1.52, brown or dark brown; IV, length 1.19, dark brown. **Pronotum:** mesal length 0.78–0.82, posterior width 1.46–1.52; disk broadly tinged with brown, posterior submargin with wavy fuscous band, sometimes breaking into six fuscous spots, extreme posterior margin pale; lateral margins of disk narrowly infuscated; collar and calli marked with reddish brown or fuscous; propleura white, dorsal margin broadly fuscous, anteromedial stripe also fuscous. **Scutellum:** narrow median line pale, narrowly to broadly bordered laterally with fuscous; lateral margins broadly pale except with fuscous patch before apex. **Hemelytra:** grayish white with moderate scattering of brown to fuscous spots and larger maculae, sometimes more extensively darkened along veins and inner margin of cuneus; membrane conspurcate, veins pale except radius fuscous. **Legs:** femora grayish white with reddish brown or fuscous markings mostly on distal half; hind femora more extensively darkened distally but leaving spots and larger maculae pale; front and middle tibiae pale with four fuscous annuli including narrow basal band; hind tibiae marked with fuscous especially basally, but lacking dark annuli. **Vestiture:** as noted in group description. **Genitalia:** Figure 250.

Female. Unknown.

ETYMOLOGY: From the Latin, *leucophaeus* (ash-colored, dun), referring to the grayish brown general coloration of the species.

DISCUSSION: *Phytocoris leucophaeus* is known from Riverside and San Diego counties in California. The host plant association is not known. The holotype and one male paratype were collected at light.

***Phytocoris maritimus* Van Duzee**

Figure 251

Phytocoris maritimus Van Duzee, 1920: 349, 350.
– Carvalho, 1959: 205. – Knight, 1968: 226.
Phytocoris sequoiae Bliven, 1954: 112–114, fig. 3.
– Carvalho, 1959: 216. NEW SYNONYMY.

TYPES: *Phytocoris maritimus* was described from six specimens collected at Carmel, Monterey Co., California, 24 March 1919, on cypress, E. P. Van Duzee. The male ho-

lotype (no. 701), allotype (no. 702), and two paratypes are retained in the Van Duzee Collection (CAS). The remaining two paratypes are deposited in the Knight Collection (USNM).

The junior synonym, *sequoiae*, was described from 52 specimens taken at Eureka, Humboldt Co., California, 28 August–6 November (male holotype, 7 September 1952), ex. *Sequoia sempervirens* (D. Don) Endl., B. P. Bliven. All type material is retained in the collection of the CAS.

DIAGNOSIS: Similar to *leucophaeus* but distinguished by the lighter brown general coloration with fewer fuscous markings; hemelytra, especially cuneus, often tinged with red; posterior submargin of pronotal disk with unbroken fuscous band; and scutellum, except dark spot on distolateral margins, and clavus without fuscous markings. The male genital structures are similar to those of *canescens* and *leucophaeus* (see group discussion), differing primarily in the shape of the sclerotized process of the vesica (fig. 251e), and primary membranous sac of vesica with smaller sclerite on apex of right lobe; further differentiated from *canescens* by the absence of tubercles above the paramere bases (fig. 251a).

REDESCRIPTION: Length 5.2–6.8; brown or reddish brown general coloration. **Head:** pale grayish yellow with red to fuscous markings; frons with reddish striae laterally, meeting tylus along shallow depression; eyes occupying three-fourths of height of head in lateral view. **Antennae:** yellowish brown, segment IV usually darker brown; segment I reticulated with reddish brown dorsally and laterally, tinged with reddish brown or fuscous ventrally; segment II with pale annulus at base. **Pronotum:** disk grayish yellow or pale gray, sometimes lightly to moderately tinged with red, posterior submargin with unbroken fuscous band; propleura grayish yellow, lightly infuscated in darker specimens, often with dark anteromedial stripe. **Scutellum:** grayish yellow, sometimes tinged with red or reddish brown; usually with fuscous spot distolaterally. **Hemelytra:** pale grayish yellow, sometimes tinged with red especially on cuneus; basal third of corium with broad fuscous band, sometimes reaching along inner margin of

corium to near apex; posteromedial region of corium with angulate pale patch, sometimes preceded by fuscous mark; embolium, and inner margin and apex of cuneus marked with fuscous in darker specimens; membrane moderately to densely mottled with fuscous spots. **Legs:** femora white or pale yellow, reticulated with brown or reddish brown mostly on distal half; hind femora more extensively darkened and marked with pale spots; tibiae pale, front and middle pair with three fuscous annuli, sometimes obscured in pale specimens. **Vestiture:** as noted in group description. **Male genitalia:** Figure 251. Genital capsule without tubercles above paramere bases.

DISCUSSION: *Phytocoris maritimus* is distributed along the coast of California from Del Norte County to Monterey County. Adults and nymphs have been collected on *Cupressus* sp. and *Sequoia sempervirens* (D. Don) Endl. I have examined 135 specimens with collection dates from February 19 to November 26.

Specimens collected on *Cupressus* are usually much darker than those taken from *Sequoia*. However, the color pattern is the same for specimens found on both plant species. The shape of the sclerotized process of the vesica is slightly variable, sometimes with one or two small serrations apically, but this is not correlated with geography or host plant association. Other structures of the male genitalia display little or no variation over the range of distribution. On the basis of this information, *sequoiae* is here placed in synonymy with *maritimus*.

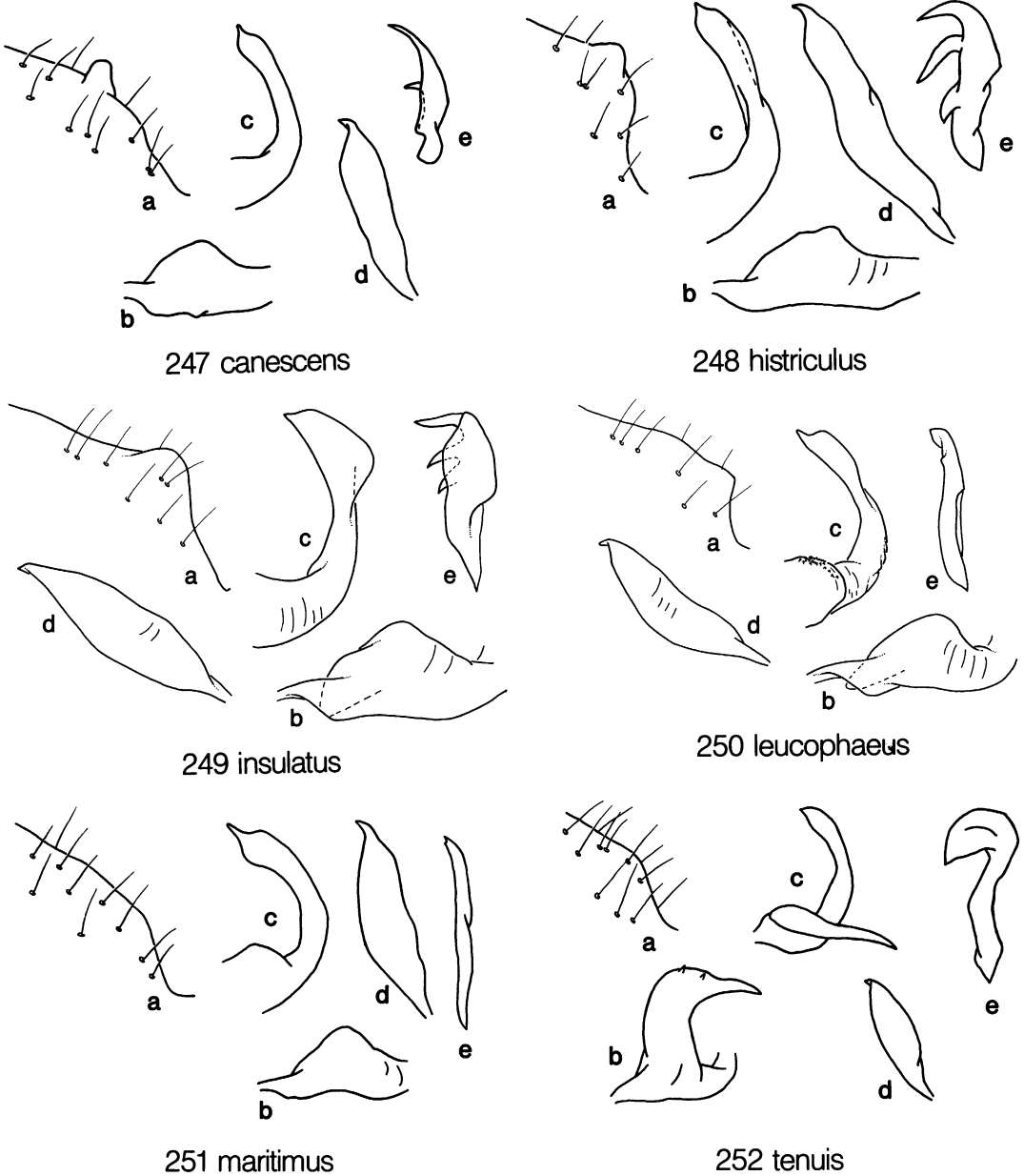
Phytocoris tenuis Van Duzee

Figures 244–246, 252

Phytocoris tenuis Van Duzee, 1920: 341, 342. – Carvalho, 1959: 218. – Knight, 1968: 215, fig. 261.

Phytocoris gracillatus Knight, 1968: 229, 230, fig. 278. NEW SYNONYMY.

TYPES: *Phytocoris tenuis* was described from three specimens collected on Mt. Tamalpais, Marin Co., California. The male holotype (no. 690) and allotype (no. 691) were taken by E. P. Van Duzee on 23 June 1918, and a single



Figs. 247–252. Male genitalia of *tenuis* group species. a. Left dorsolateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica.

female paratype on 19 September 1909 by E. C. Van Dyke. All type material is retained in the Van Duzee Collection (CAS).

The junior synonym, *gracillatus*, was described from six specimens collected in Ne-

vada, Utah, and Washington. The male holotype was taken in Area 19M, Nevada Test Site, nr. Mercury, Nye Co., Nevada, 23 June 1965, ex. *Artemisia tridentata* Nutt., H. H. Knight and J. M. Merino. All type material

is retained in the Knight Collection (USNM); two paratypes were not located.

DIAGNOSIS: Recognized by the large eyes, length five-sixths of height of head in lateral view (fig. 244); length of antennal segment I less than or equal to posterior width of pronotum, ventral surface of segment mostly pale; and structure of the male genitalia, especially the genital capsule without tubercle or broadly swollen region above base of left paramere (fig. 252a), sensory lobe of left paramere with large dorsal process (fig. 252b, c), and vesica with club-shaped sclerotized process (fig. 252e).

REDESCRIPTION: Length 5.0–7.8; grayish white or pale brownish yellow ground color with brown to fuscous markings. **Head:** antennae brownish yellow to fuscous, except segment I pale with dark maculae on dorsal aspect, segments III and IV usually darker than segment II; frons moderately convex with dark striae laterally; eyes occupying five-sixths of height of head in lateral view. **Pronotum:** disk lightly to moderately tinged or shaded with fuscous, posterior submargin with series of dark, setiferous patches, extreme posterior margin pale; propleura pale, usually with one or two fuscous stripes crossing anterior margin. **Hemelytra:** grayish white or brownish yellow, moderately to densely mottled with spots and larger maculae of brown to fuscous; membrane conspurcate. **Legs:** femora white or pale yellow with reticulate pattern of fuscous mostly on apical half, dark regions often broken by pale spots; tibiae pale with fuscous markings, front pair with three dark annuli, bands poorly defined or obsolete in pale specimens; middle and hind tibiae sometimes with dark annuli. **Vestiture:** as noted in group description, dorsum rarely with limited dark, sericeous setae mostly on distal third of corium. **Male genitalia:** Figure 252.

DISCUSSION: *Phytocoris tenuis* is widely distributed in the western United States, predominantly in the Intermountain Sagebrush and American Desert provinces. Specimens have been collected as far north as Chelan Co., Washington, and Sublette Co., Wyoming; east to Eagle Co., Colorado; and south to Cochise Co., Arizona, and San Diego Co., California. In general, the Cascade Range,

Sierra Nevada Mts., and coastal mountain ranges of southern California form the western boundary of the distribution. However, specimens have been collected west of the Sierra Nevada Mts. as far north as Marin and Calaveras counties. This species is most commonly taken on *Artemisia tridentata* Nutt., but specimens also have been collected on *Chrysothamnus nauseosus* (Pall.) Britton., *C. viscidiflorus* (Hook.) Nutt., and *Gutierrezia sarothrae* (Pursh.) Britt. & Rusby. Both sexes are attracted to light. I have examined several hundred specimens with collection dates mostly between April 12 and October 18, but as early as December in desert regions of Arizona and California.

This species is highly variable in size and coloration, but is readily recognized by the structure of male genitalia. The holotype of *tenuis* and other specimens from populations west of the Sierra Nevada Mts. are paler yellowish brown usually with dark stripes on the pronotal disk, while specimens from the major portion of the range, including the type of *gracillatus*, tend to be darker brown or gray to grayish brown without distinct pronotal stripes. Some of the largest and darkest specimens were collected in the coastal mountain ranges of southern California. Small, 5.0–5.5, pale yellow to nearly white specimens with limited dark markings are sometimes encountered in Great Basin or desert populations.

The genital structures of *tenuis* also show some variation, particularly the size of the dorsal process of the left paramere and the shape of the sclerotized process of the vesica. However, the variation is not correlated with geography and is more or less continuous from one extreme to the other. Also, there is little correspondence in the variation exhibited by different characters. Based on this information, I am treating *tenuis* as one highly variable species, recognizing *gracillatus* as its junior synonym. My study of museum specimens did not indicate that more than one species was involved or that any of the sampled populations warranted subspecific rank. An extensive field study may help to explain the wide range of variation displayed by this species (e.g., geographic isolation, temporal occurrence, host plant utilization).

TILIAE SPECIES-GROUP

DIAGNOSIS: Recognized by the brown or grayish brown general coloration; short head with large eyes (fig. 254); dorsal vestiture with dark, simple setae and silvery white, sericeous setae only (fig. 255); and structure of the male genitalia, especially the genital capsule without tubercles above paramere bases and vesica with broadly attached, comblike sclerotized process.

DESCRIPTION: Moderate size, 5.5–7.0, brown or grayish brown species with dark, simple setae and narrow, silvery white, sericeous setae. **Head:** short in lateral view with height noticeably greater than length and frons only slightly produced anteriorly of antennal fossae; antennae brown or black; segment I with irregular white markings dorsally and laterally, length of segment greater than width of head across eyes; segment II usually with pale annulus medially; frons weakly and evenly convex, meeting tylus along shallow depression; eyes obovate to slightly reniform, occupying about two-thirds of height of head in lateral view. **Pronotum:** disk white or pale yellow with limited to extensive brown or fuscous markings, extreme posterior margin pale; propleura fuscous, apical third to one-half pale, darkened basal region sometimes interrupted by transverse pale line. **Hemelytra:** grayish white or pale grayish yellow ground color, sometimes lightly tinged with green in *tiliae*; corium and clavus moderately to extensively mottled with brown or fuscous; apex of corium with large pale patch; membrane mottled with brown or fuscous. **Legs:** femora white or pale yellow with reddish brown to fuscous markings mostly on apical half, darkened regions usually interrupted by pale spots; hind femora with oblique, pale band before apex; tibiae pale with brown markings, front and middle pair with three well-defined dark annuli. **Male genitalia:** genital capsule without tubercles above paramere bases. **Left paramere:** sensory lobe moderately to strongly produced; shaft slightly expanded distally in dorsal view; apex rounded. **Right paramere:** lanceolate to slightly quadrate; apex narrowly produced, acute. **Vesica:** primary membranous sac multilobed, lobes without patches of tubercles or

small spines; right basal lobe well developed with weakly sclerotized outer surface, left basal lobe weakly developed or indistinct; basal process well sclerotized, extending to level of gonopore or slightly beyond; sclerotized process elongate with deep longitudinal furrow medially, dorsal margin with 20–30 small, toothlike serrations; inner, concave surface of process, except distally, weakly sclerotized and broadly attached to right lobe of primary sac.

DISCUSSION: The *tiliae* group comprises three species, all of which are introduced from the Palearctic region. These species have patchy coastal distributions in southern Canada and the northern United States. *Phytocoris dimidiatus* and *tiliae* have been introduced along both seaboards, while *populi* is known only from the West Coast.

Tiliae group species are bark-inhabitants, and are reported to be largely predaceous (Collyer, 1953; Southwood and Leston, 1959; Wagner, 1971). In North America, these species inhabit a variety of deciduous trees including *Alnus*, *Corylus*, *Pyrus*, *Salix*, and *Tilia*.

Members of the *tiliae* group are most closely related to other Palearctic species which have been placed in the subgenus *Phytocoris* by Wagner (1971). This subgenus appears to be monophyletic, and based on the structure of the male genitalia has its closest affinities with other groups of Palearctic *Phytocoris* (see other subgenera recognized by Wagner, 1971). In North America, *tiliae* group species are most similar to species of the *stellatus* and *interspersus* groups, the three groups sharing a similar head structure, dorsal vestiture, and nontuberculate genital capsule. However, certain features of the male genitalia, including the structure of the sclerotized process and basal lobes of the vesica, suggest a relationship with the *lasiomerus* group (see *lasiomerus* group discussion).

No attempt was made to locate the types of *tiliae* group species or to obtain these specimens for examination. These are widely distributed and well documented Palearctic species, and there does not appear to be any confusion as to their identity in recent Eu-

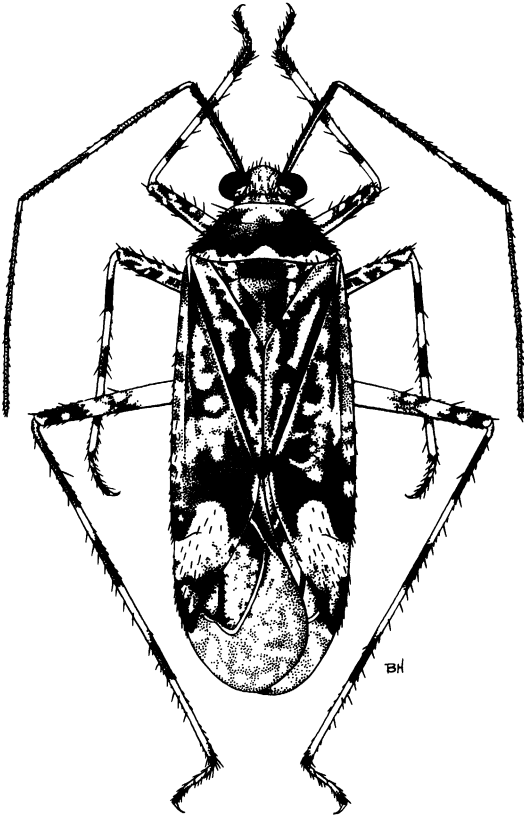


Fig. 253. *Phytocoris populi*, dorsal habitus of male.

ropean literature (Southwood and Leston, 1959; Wagner and Weber, 1964; Wagner, 1971). Identified European specimens were borrowed from the USNM for comparison

with material collected in western North America.

KEY TO SPECIES OF THE *TILIAE* GROUP

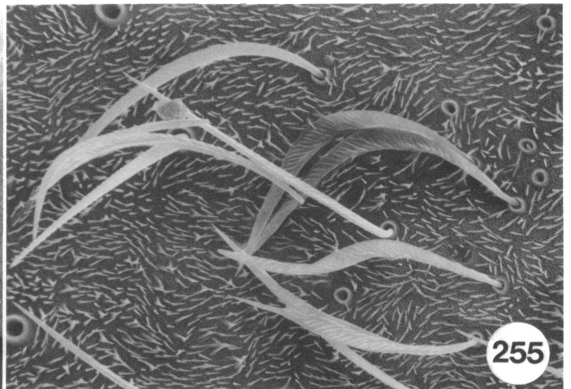
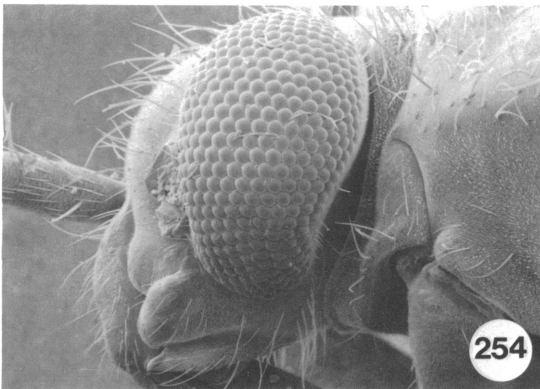
- 1 Antennal segment I fuscous with two or three longitudinal, pale stripes; shaft of left paramere broadly expanded distally in dorsal view (fig. 257b) *populi* (Linnaeus)
- Antennal segment I with scattered pale spots, but lacking distinct longitudinal stripes; shaft of left paramere narrowly expanded distally (figs. 256b, 258b) 2
- 2(1) Pronotal disk greenish yellow or pale grayish yellow, lateral margins broadly fuscous; pale annuli on mesotibiae broader than dark annuli *tiliae* (Fabricius)
- Pronotal disk brown or dark yellowish brown, without strongly contrasting dark lateral margins; pale annuli on mesotibiae narrower to at most as broad as dark annuli *dimidiatus* Kirschbaum

Phytocoris dimidiatus Kirschbaum

Figure 256

Phytocoris dimidiatus Kirschbaum, 1855: 199. – Butler, 1923: 385. – Knight, 1923: 630, 631, fig. 136. – Blatchley, 1926: 708. – Carvalho, 1959: 196, 197 (see this catalog for complete listing of pre-1959 citations). – Southwood and Leston, 1959: 297, pl. 51, 1. – Wagner and Weber, 1964: 128, 129, fig. 92c. – Wagner, 1971: 175, 176, figs. 127d, 128d, 133a–c. – Stonedahl, 1983a: 469, 470.

DIAGNOSIS: Length 6.0–6.8. *Phytocoris dimidiatus* is recognized by the dark brown



Figs. 254, 255. *Phytocoris tiliae*. 254. Lateral view of head. 255. Sericeous setae of dorsal vestiture.

general coloration, unicolored pronotal disk without dark lateral margins, and narrow pale annuli on the mesotibiae. The male genital structures are similar to those of *tiliae* but the shaft of the left paramere is more angulate apically (fig. 256b) and the right paramere is narrower (fig. 256c). This species is easily distinguished from *populi* by the absence of pale stripes on antennal segment I and the structure of the male genitalia.

DISCUSSION: *Phytocoris dimidiatus* is widely distributed in the Palearctic region (Carvalho, 1959; Southwood and Leston, 1959). It occurs on a number of deciduous trees in Europe, and is reported by Wagner (1971) to be at least partially predaceous. The adults are found from mid-June to November in England (Southwood and Leston, 1959).

This species was first recorded in North America from Kentville, Nova Scotia (Knight, 1923), and more recently from British Columbia, Oregon, and Washington (Stonedahl, 1983a). Adults have been collected on *Pyrus*, and both sexes have been taken at light. Twenty-three specimens were examined from the following localities: **BRITISH COLUMBIA.** Lulu Is. (UBC). **OREGON.** Benton Co.: Corvallis (OSU). Klamath Co.: Klamath Falls (OSU). Multnomah Co.: Portland (OSU). Yamhill Co.: McMinnville (OSU). **WASHINGTON.** Whatcom Co.: Bellingham (OSU). Collection dates are from July 9 to September 6.

Phytocoris populi (Linnaeus)

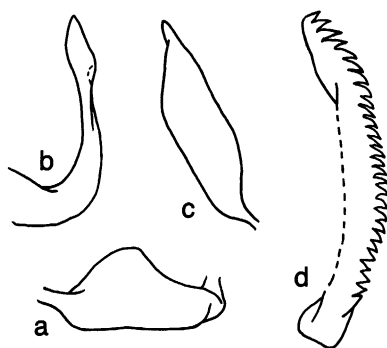
Figure 257

Cimex populi Linnaeus, 1758: 449.

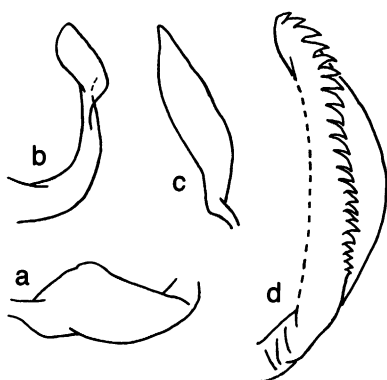
Phytocoris populi: Zetterstedt, 1828: 488. – Butler, 1923: 381. – Carvalho, 1959: 211, 212 (see this catalog for complete listing of pre-1959 citations). – Southwood and Leston, 1959: 296, 297, fig. 121. – Wagner and Weber, 1964: 126, 127, figs. 92b, 93c, 94b. – Wagner, 1971: 174, 175, figs. 125, 127c, 128c, 132c. – Stonedahl, 1983a: 463–465, figs. 1–5.

DIAGNOSIS: Length 6.5–7.0. *Phytocoris populi* is distinguished from *dimidiatus* and *tiliae* by the longitudinal, pale stripes on antennal segment I, and the broadly expanded shaft of the left paramere (fig. 257b).

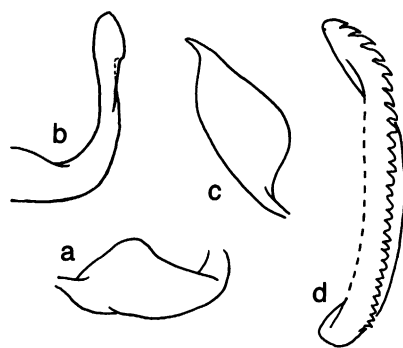
DISCUSSION: *Phytocoris populi* is widely distributed in the British Isles, continental



256 *dimidiatus*



257 *populi*



258 *tiliae*

Figs. 256–258. Male genitalia of *tiliae* group species. a. Arm of left clasper, lateral view. b. Shaft of left clasper, dorsal view. c. Right clasper, lateral view. d. Sclerotized process of vesica.

Europe, and northern Africa (Carvalho, 1959; Southwood and Leston, 1959; Wagner, 1971). It occurs on a variety of deciduous trees (But-

ler, 1923; Wagner, 1971) and is reported by Southwood and Leston (1959) to be a bark-inhabiting species. Adults are found from June to November in England (Butler, 1923).

This species was reported from North America by Stonedahl (1983a); locality data: Bellingham, Whatcom Co., Washington and Vancouver, British Columbia, Canada. Collection dates are from July 17 to August 10. In Washington, late instar nymphs and adults were collected on trunks and large branches of *Alnus rubra* Bong.

Phytocoris tiliae (Fabricius)

Figure 258

Cimex tiliae Fabricius, 1776: 301.

Phytocoris tiliae: Fallen, 1829: 85. – Butler, 1923: 382. – Downes, 1924: 29; 1957: 11. – Collyer, 1953: 99. – Carvalho, 1959: 218, 219 (see this catalog for complete listing of pre-1959 citations). – Southwood and Leston, 1959: 296, fig. 122, pl. 51, 2. – Wagner and Weber, 1964: 125, 126, figs. 92a, 93a, 94a. – Wagner, 1971: 172, figs. 127a, b, 131c, d, 132a. – Wheeler and Henry, 1976: 25–28. – Stonedahl, 1983a: 467–469.

DIAGNOSIS: Length 5.5–6.6. *Phytocoris tiliae* is recognized by the greenish yellow or pale grayish yellow pronotal disk with the lateral margins broadly fuscous; first antennal segment without pale longitudinal stripes; and male genitalia with shaft of left paramere

broadly rounded apically (fig. 258b) and broad right paramere (fig. 258c).

DISCUSSION: *Phytocoris tiliae* is distributed throughout the British Isles, continental Europe, and much of northern Africa (Carvalho, 1959; Southwood and Leston, 1959). It inhabits the bark of many deciduous trees in Europe (Butler, 1923) and is reported to be largely predaceous on mites and small insects (Collyer, 1953; Southwood and Leston, 1959). In England, adults are present from late June until late October.

This species was first recorded in North America from Vancouver, British Columbia (Downes, 1924) and later from New York and Washington by Wheeler and Henry (1976). Stonedahl (1983a) reported *tiliae* from two localities in northwestern Oregon. In western North America, adults have been collected on *Alnus*, *Corylus*, *Pyrus*, *Salix*, and *Tilia*. I have examined 78 specimens from the following localities: BRITISH COLUMBIA. Agassiz (UBC); Vancouver (UBC); Victoria (UBC). OREGON. Benton Co.: Corvallis (OSU). Linn Co.: Albany (OSU). WASHINGTON. King Co.: Seattle (OSU). Lewis Co.: Chehalis (OSU). Pierce Co.: Puyallup (USNM). Snohomish Co.: Chase Lk. (CAS). Whatcom Co.: Bellingham (OSU). Collection dates are from July 19 to October 17.

SPECIES WITH UNCERTAIN GROUP AFFILIATION

The species treated in this section do not satisfactorily fit any of the previously described groups. Some species possess characters that are diagnostic for different species-groups, while others have unique features not found in any of the recognized groups. Several of the included taxa (e.g., *neglectus*, *varipes*) belong to groups whose species are distributed predominantly outside western North America.

Phytocoris becki Knight

Figures 264, 265

Phytocoris becki Knight, 1968: 214, 215, fig. 259.

TYPES: Described from 56 specimens collected near Mercury, Nye Co., Nevada (Nevada Test Site). The male holotype, allotype,

and 28 paratypes were taken in Area TM (Tippipah Spgs.), Nevada Test Site, 14 June 1965, ex. *Ephedra nevadensis* Wats., D. E. Beck, H. H. Knight, and J. M. Merino. All type material is retained in the Knight Collection (USNM) except eight paratypes deposited in the collection of BYU and three paratypes that were not located.

DIAGNOSIS: *Phytocoris becki* is recognized by the pale yellowish green hemelytra, gray pronotum with fuscous markings, reddish yellow femora, and uniformly brownish yellow antennae (see frontispiece of Knight, 1968). The pronotum is clothed with white, sericeous setae, and narrow, black, scalelike setae.

REDESCRIPTION: Length 6.0–7.0. **Head:** pale yellow; tylus strongly produced basally,

sometimes marked with red medially. **Antennae:** uniformly brownish yellow, segment I twice as thick as segment II, sometimes lightly tinged with red. **Pronotum:** disk pale gray with fuscous markings particularly around calli and along posterior margin; posterior submargin of disk with four low rounded tubercles; collar fuscous to nearly black; propleura pale, sometimes tinged with fuscous dorsally. **Scutellum:** pale yellow, often lightly tinged with red medially. **Hemelytra:** uniformly pale yellowish green; membrane flecked with fuscous, areolar cells dusky yellow. **Legs:** femora pale yellow, often becoming brownish yellow distally, moderately tinged with red producing reddish yellow or reddish orange overall coloration; tibiae pale yellow to brownish yellow, sometimes lightly marked with red basally. **Vestiture:** dorsum with pale, simple setae and silvery white, sericeous setae; pronotum also with some narrow, black, scalelike setae. **Male genitalia:** Figure 265.

DISCUSSION: I have examined 120 specimens of *becki* from Inyo and San Bernardino counties, California; Nye Co., Nevada; San Juan and Washington counties, Utah; and Mohave Co., Arizona. Collection dates are from May 16 to July 12. Adults and nymphs have been collected on *Ephedra nevadensis* Wats.

Phytocoris laevis (Uhler)

Figures 261, 266

Callodemus laevis Uhler, 1895: 33, 34.

Phytocoris laevis: Reuter, 1909: 14 (n. comb.). – Van Duzee, 1917a: 316. – Knight, 1927a: 44. – Carvalho, 1959: 204. – Knight, 1968: 216. – Kelton, 1980: 166, fig. 115, map 49. – Henry and Stonedahl, 1983: 455.

Phytocoris rolfsi Knight, 1934: 1–3. – Carvalho, 1959: 214. – Knight, 1968: 216. NEW SYNONYMY.

TYPES: According to the original description, *laevis* was described from one female taken at Glenwood Springs, Colorado, August 24, by Gillette and a single specimen collected in New Mexico. A male with label data, "Albu[querque], N. M., 9-19-88," was discovered in the collection of the USNM and designated a lectotype by Henry and Stonedahl (1983). This specimen was tagged with

a label in Uhler's handwriting reading "*Callodemus laevis*, N. M., det. Uhler," and is most likely the individual from New Mexico upon which Uhler based the original description. A female with label data "Colorado," was designated a paralectotype by Henry and Stonedahl (1983). Both specimens are deposited in the USNM.

The junior synonym, *rolfsi*, was described from 13 specimens collected in Yakima Co., Washington by A. R. Rolfs. The male holotype and one male paratype were taken at Wiley City, 23 September 1931, on *Chrysanthamnus nauseosus* Pall. The holotype, allotype, and three paratypes are retained in the Knight Collection (USNM); one paratype each is deposited in the collection of TA&M and WSU; six paratypes were not located.

DIAGNOSIS: Distinguished from other western species of *Phytocoris* by the large size; pale yellow to yellowish brown general coloration; dorsum without scalelike setae; strongly convex, almost conical frons (fig. 261); tubercle on anterodorsal angle of lorum (fig. 261); fuscous spot behind calli; and structure of the male genitalia (fig. 266).

REDESCRIPTION: Length 6.5–10.4; yellowish to dusky brown general coloration. **Head:** antennae pale yellow to yellowish brown; segment I thicker on basal half, usually marked with brown spots or reticulations; frons strongly convex, somewhat conical, reaching well beyond and overhanging base of tylus; lorum greatly inflated, anterodorsal angle with small knoblike protuberance; rostrum reaching between middle coxae or sometimes between hind coxae. **Pronotum:** disk grayish white or pale yellow with fuscous spot posteriorly of inner angle of each callus; collar, calli, and disk sometimes lightly tinged with brown to fuscous in darker specimens; propleura uniformly pale. **Scutellum:** pale with fuscous distolateral marks. **Hemelytra:** grayish white or pale yellow with brownish yellow to dark brown markings, sometimes with brown reticulations; membrane marked with fuscous spots and larger maculae especially inside and behind areolar cells. **Legs:** femora pale yellow or brownish yellow, reticulated with brown or dark brown; front and middle femora slightly swollen apically; tibiae mostly pale, apices sometimes narrowly darkened; tibial spines and smaller spinulae brownish

yellow to dark brown or black. **Vestiture:** dorsum with short, mostly pale, simple setae and silvery white sericeous setae. **Male genitalia:** Figure 266. Genital capsule without tubercles above paramere bases.

DISCUSSION: *Phytocoris laevis* has been collected in all states west of the Rocky Mts. and also is known from Presidio County in western Texas. Specimens have been collected as far south as San Diego Co., California; north to Yakima Co., Washington; and east to Gallatin Co., Montana, Sweetwater Co., Wyoming, Las Animas Co., Colorado, Lincoln Co., New Mexico, and Presidio Co., Texas. The Cascade Range and Sierra Nevada Mts. form the western boundary of the distribution. Knight (1968) reported this species from South Dakota and Alberta, Canada, and Kelton (1980) added records from Saskatchewan, Canada. Adults and nymphs of *laevis* have been collected on *Chrysothamnus nauseosus* Pall., *C. viscidiflorus* (Hook.), and *Gutierrezia* Lag. I have examined several hundred specimens with collection dates from August 5 to November 3.

Phytocoris laevis and its junior synonym, *rolfsi*, were treated as two distinct taxa by Stonedahl (1983b), based primarily on differences in dorsal coloration and the color of the tibial spines and spinulae. I have since found these color characters to be more variable than originally determined, showing a more or less continuous grade from light to dark. Also, the slight difference in frons convexity first noted by Knight (1968) in the original description of *rolfsi*, does not in my opinion distinguish any recognizable subset of *laevis* individuals. Finally, as noted by Stonedahl (1983b) the genitalia of these two nominal species are essentially identical and provide no characters for distinguishing the taxa. Based on this revised information, *rolfsi* is here placed in synonymy with *laevis*.

***Phytocoris lycii*, new species**

Figures 262, 263, 267

HOLOTYPE MALE: 14 mi SW of Wickenburg on Vulture Mine Rd. 600–700 m, Maricopa Co., Arizona, 1 April 1981, ex. *Lycium andersonii* Gray or *L. berlandieri* Dunal, R. T. Schuh and M. D. Schwartz (AMNH).

PARATYPES: ARIZONA. **Maricopa Co.:** 1

male, 4 females, same data as holotype; 1 female, Woolsey Wash nr. Painted Rock Dam, 250 m, 3 April 1981, ex. *Lycium fremontii* Gray, R. T. Schuh (AMNH); 1 male (abdomen missing), Tempe, 15 December 1919, at light, E. V. Walter and H. L. Arnold (ASU). **Pima Co.:** 1 male, Ajo, 9 April 1947, H. and M. Townes (USNM). **Yuma Co.:** 1 male, Dunes, 8 mi N Bouse, 20 March 1980, Werner, Olson, Hetz, and MacLachlan (ASU).

DIAGNOSIS: Recognized by the large size; grayish brown general coloration; long, bristlelike setae on legs and antennal segment I (also segment II of female, fig. 262); eyes of male occupying about five sixths of height of head in lateral view; antennal segment I about half again as long as width of head across eyes; antennal segment II uniformly brown or yellowish brown, without pale annulus medially; dorsal vestiture with long, dark, simple setae, black scalelike setae, and clumps of silvery white sericeous setae (fig. 263); fore tibiae with four dark annuli, but leaving apex narrowly pale; and by the structure of the male genitalia (fig. 267).

DESCRIPTION: *Male.* Length 7.10–8.35, width 2.20–2.50; grayish brown general coloration. **Head:** width across eyes 1.02–1.08, vertex 0.38–0.39; white or pale yellow with reddish brown and fuscous markings; frons moderately convex anteriorly, with six or seven dark striae laterally, tylus moderately produced basally, meeting frons along broad depression; eye obovate, occupying five sixths of height of head in lateral view. **Rostrum:** length 2.39–2.60, reaching between hind coxae. **Antennae:** I, length 1.46–1.57, yellowish white with brown to fuscous maculae and long, pale, bristlelike setae dorsally and laterally, ventral surface mostly pale; II, length 3.08–3.50, brown or dark yellowish brown; III, length 1.50–1.65, brown or dark brown; IV, length 0.84, brown or dark brown. **Pronotum:** mesal length 0.76–0.90, posterior width 1.41–1.65; disk grayish white with spots and larger maculae of brown to fuscous, sometimes broadly tinged with fuscous, posterior submargin usually more extensively darkened, especially on lateral angles, and with four weakly tumid points; propleura pale, dorsal margin and stripe crossing antero-medial margin reddish brown or fuscous. **Scutellum:** brownish yellow; median line and

apex narrowly pale, bordered laterally with fuscous; anteromedial region and distolateral spot sometimes more broadly darkened. **Hemelytra:** grayish white with moderate scattering of brown to fuscous spots and larger maculae, usually more extensively darkened along veins and inner margin of cuneus or sometimes with inner half of corium and cuneus broadly suffused with fuscous; membrane conspurcate, veins pale, sometimes tinged with red, anterior half of radius infuscated. **Legs:** femora grayish white or pale brownish yellow with reddish brown to fuscous reticulations mostly on distal half; tibiae pale with fuscous markings; front and middle tibiae with four dark annuli including narrow basal band, apices of fore tibiae narrowly pale; banding less obvious on hind tibiae; tibiae and distal half of all femora with long, erect, bristlelike setae. **Vestiture:** as noted in diagnosis. **Genitalia:** Figure 267.

Female. Similar to male in color, vestiture, and structure except vertex broader, rostrum slightly longer, second antennal segment with long, erect, bristlelike setae, and hemelytral membrane noticeably shorter. Length 6.90–7.00, width 2.38–2.42. **Head:** width across eyes 1.05–1.10, vertex 0.50–0.51. **Rostrum:** length 2.82–2.90, reaching fourth abdominal segment. **Antennae:** I, 1.65–1.66; II, 3.15–3.25; III, 1.62; IV, missing or teneral. **Pronotum:** mesal length 0.82–0.85, posterior width 1.58–1.69.

ETYMOLOGY: Named for the genus of its host plant, *Lycium* L. (Solonaceae).

DISCUSSION: *Phytocoris lycii* is known only from the type material collected in the desert region of southwestern Arizona. Adults have been taken on several species of boxthorn, *Lycium*.

Based on external morphology, coloration, and structure of the male genitalia, especially the form of the vesica, *lycii* appears to be most closely related to members of the *tenuis* group. It was not included in that group because of the conspicuous black, scalelike setae and very long, simple setae on the dorsum, and the long, erect, bristlelike setae on the legs and first two antennal segments. These types of vestiture are not found in any *tenuis* group species, although as noted in the *tenuis* group description, some of the included taxa do possess scattered, dark, sericeous setae.

Under SEM examination, the scalelike setae of *lycii* (fig. 263) appear similar to the sericeous setae of *tenuis* (fig. 245), which suggests that the dorsal vestitures of these two species may be more similar than given credit for in the present study. A more comprehensive survey of setal types and fine structure of setae in the genus *Phytocoris* and other mirine genera is needed to adequately address this problem.

Because of the black, scalelike setae on the dorsum and the unbanded second antennal segment, *lycii* is easily confused with members of the *aurora* group. However, the mostly pale propleura, bristlelike setae on the legs and antennae, and structure of the male genitalia will distinguish *lycii* from *aurora* group species.

Phytocoris mesillae Knight

Figure 268

Phytocoris mesillae Knight, 1968: 258, 259, fig. 314.

TYPES: Described from two male specimens collected at Mesilla Pk., Dona Ana Co., New Mexico, 12 July 1917, taken at light, H. H. Knight. The holotype is deposited in the Knight Collection (USNM); the paratype was not located.

DIAGNOSIS: Externally, *mesillae* closely resembles members of the *conspurcatus* and *aurora* groups but is distinguished by the narrowly fuscous base of antennal segment II and male genitalia with broad, vertical tubercle above base of left paramere (fig. 268a), greatly reduced membranous portion of vesica without sclerotized regions, and structure of the sclerotized process of the vesica similar to that of *fraterculus* group species with bulbous base and tapered distal region (fig. 268e).

REDESCRIPTION: Length 5.6–6.1; grayish white ground color with fuscous markings. **Head:** pale yellow with reddish brown or fuscous markings; frons weakly convex, with five or six faint dark striae laterally; tylus prominent. **Antennae:** I, white or pale yellow with fuscous reticulations, ventral surface mostly pale; II, fuscous with pale annulus bordering narrowly darkened basal region, and slightly broader pale band medially, dark basal half of segment with one or two additional pale marks on dorsal aspect; III, fuscous, narrowly

pale at base; IV, fuscous. **Pronotum:** disk grayish yellow with dark setiferous spots, posterior submargin with fuscous band and four slightly elevated points; anterior angles, calli, and collar marked with reddish brown to fuscous; propleura pale with incomplete fuscous line medially. **Scutellum:** mostly pale, triangular anteromedial region and spot either side before apex fuscous. **Hemelytra:** grayish white or pale grayish yellow, mottled with brown to fuscous spots especially at bases of simple setae; cuneus tinged with red along outer margin; membrane densely conspurcate. **Legs:** femora white or pale yellow with reddish brown or fuscous markings, mostly on apical half; hind femora with reticulate pattern; tibiae pale with three or four dark annuli, bands on hind tibiae faint or sometimes obsolete. **Vestiture:** dorsum with dark simple setae, black scalelike setae, and patches of silvery white sericeous setae. **Male genitalia:** Figure 268.

DISCUSSION: In addition to the holotype, I have seen only five specimens of *mesillae* from the following localities: NEW MEXICO. **Hidalgo Co.:** 3 females, 2 mi N Rodeo, 1300 m (AMNH). **Luna Co.:** 1 male, 1 mi W Columbus (UCR). TEXAS. **Presidio Co.:** 1 male, Presidio (TA&M). Collection dates are from April 11 to August 15. The specimens collected near Rodeo were taken on *Ephedra trifurca* Torr. and the male from Presidio was collected at black light.

Phytocoris neglectus Knight

Figures 259, 269

Phytocoris neglectus Knight, 1920: 54, pl. I, fig. 3. – Parshley, 1921: 20. – Knight, 1923: 634, 635, fig. 149. – Blatchley, 1926: 719, pl. XI, fig. 3. – Knight, 1941: 194, fig. 176. – Froeschner, 1949: 183. – Carvalho, 1959: 207. – Kelton, 1980: 183, 184, fig. 133, map 55.

Phytocoris yuroki Bliven, 1954: 110–112, fig. 2. – Carvalho, 1959: 221. NEW SYNONYMY.

TYPES: *Phytocoris neglectus* was described from 53 specimens collected in Maine, Massachusetts, Michigan, Minnesota, and New York. The male holotype was taken at Batavia, Genesee Co., New York, 25 June 1915, H. H. Knight. Two specimens bearing Knight paratype labels and the following label data were omitted from the original description:

1 male, Wyoming, N. Y., VI-25-1916, H. H. Knight; 1 female, Ithaca, N. Y., July 26, 1916, H. H. Knight. The holotype, allotype, and 15 paratypes are retained in the Knight Collection (USNM). The other 36 paratypes were not located.

The junior synonym, *yuroki*, was described from 14 specimens collected at Eureka, Humboldt Co., California, September 2–October 9, 1947–48, 1950–53, ex. *Sequoia sempervirens* (Lamb.) (in part), B. P. Bliven. The male holotype (27 September 1952), allotype, and all 12 paratypes are retained in the collection of the CAS.

DIAGNOSIS: *Phytocoris neglectus* is recognized by the following combination of characters: brownish general coloration; dorsal surface without dark scalelike setae; antennae brown or dark brown, segment I longer than width of head across eyes, segment II without pale annulus medially; propleura fuscous, apical third pale; front tibiae with three dark annuli and three pale annuli; genital capsule of male without tubercle above base of left paramere (fig. 269a); shaft of left paramere long, strongly curved (fig. 269c); right paramere with angulate process dorsally (fig. 269d); sclerotized process of vesica with five or six large marginal serrations (fig. 269e). Externally, this species closely resembles *dimidiatus* and *populi* of the *tiliae* group but is distinguished by the absence of a pale median annulus on antennal segment II and by the male genital structures. *Phytocoris neglectus* also resembles the *conspurcatus* group species but is easily differentiated by the absence of dark scalelike setae on the dorsum.

REDESCRIPTION: Length 5.5–7.1; brown or dark brown general coloration. **Head:** pale yellow with reddish brown or fuscous markings; frons weakly convex, meeting tylus along broad, shallow depression, lateral margins with 6–8 red to fuscous striae. **Antennae:** brown to fuscous; segment I marked with pale spots, ventral surface mostly pale; segment II narrowly pale at base. **Pronotum:** disk pale brownish yellow, moderately to extensively darkened with brown or fuscous, posterior submargin with wavy fuscous band or series of fuscous patches, extreme posterior margin pale; collar and calli often lighter grayish yellow with reddish brown to fuscous markings; propleura fuscous, apical third pale. **Scutel-**

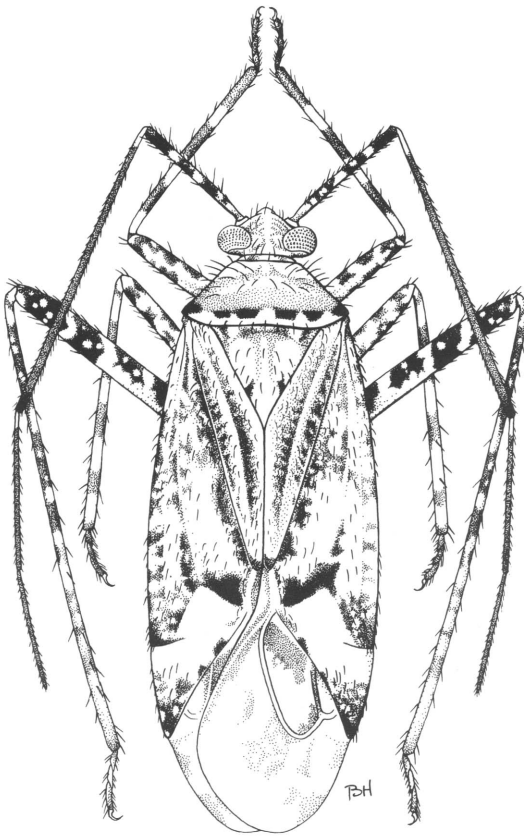


Fig. 259. *Phytocoris neglectus*, dorsal habitus of male.

lum: pale grayish yellow or brownish yellow, with fuscous mark either side before apex extending from lateral margin to near middle of disk; disk tinged with brown in darker specimens, anterior half sometimes with pale median line bordered by fuscous. **Hemelytra:** grayish yellow or pale brownish yellow with brown to fuscous markings; corium with pale region medially and at apex, apical pale region preceded by large oblique fuscous patch; membrane mottled with fuscous, edges of dark areas sometimes breaking into small spots. **Legs:** femora white or pale yellow, mottled with dark reddish brown or fuscous, dark regions broken by pale spots; tibiae pale with three fuscous annuli. **Male genitalia:** Figure 269.

DISCUSSION: *Phytocoris neglectus* is widely distributed in the midwestern and eastern United States and across southern Canada

where it occurs on the bark of deciduous and coniferous trees. Kelton (1980) reported this species as far north and west as Lesser Slave Lk. in Alberta. *Phytocoris neglectus* also is known from forested areas of all western states except Nevada. In the Rocky Mts. region, it has been collected as far south as Magdalena, Socorro Co., New Mexico and throughout the central and southwestern mountain ranges of Arizona. Along the west coast, the northernmost and southernmost records are from Monterey Co., California, and New Westminster, British Columbia. Adults have been collected on the following plants in western North America: *Abies amabilis* (Dougl.), *A. procera* Rehd., *Acer macrophyllum* Pursh., *Alnus rubra* Bong., *Castanopsis chrysophylla* (Dougl.), *Lithocarpus densiflora* (H.&A.), *Myrica californica* Cham. & Schlecht., *Pinus contorta* Dougl., *Pseudotsuga menziesii* (Mirb.), *Sequoia sempervirens* (Lamb.), *Tsuga heterophylla* (Raf.), and *T. mertensiana* (Bong.). I have examined 265 specimens with collection dates from July 18 to October 24.

Phytocoris neglectus belongs to a large group of species (Group II of Knight, 1941) that are widely distributed east of the Rocky Mts. At present, only *neglectus* is known to occur in western North America, but several other species are distributed as far west as South Dakota, Kansas, and eastern Colorado.

***Phytocoris omani*, new species**

Figure 270

HOLOTYPE MALE: 1.3 mi E of St. Hwy. 25 on Mytoge Mtn. Rd., 2621 m, Sevier Co., Utah, 16 July 1980, ex. *Artemisia tridentata* Nutt., G. M. Stonedahl and R. T. Schuh (AMNH).

PARATYPES: UTAH. Sevier Co.: 18 males, 17 females, same data as holotype (CAS, OSU, USNM); 8 males, 19 females, Dog Spg. Rd. off Rt. 25, 2688 m, 16 July 1980, ex. *Artemisia tridentata*, R. T. Schuh and G. M. Stonedahl (AMNH). **Uintah Co.:** 5 males, 3 females, Bonanza at White R. Shale Project Trailers, T9S R24E Sec. 23, 1525 m, 1–8 June 1981, ex. *Artemisia tridentata*, M. D. Schwartz (AMNH).

DIAGNOSIS: Externally, *omani* closely resembles *decurvatus* and *tenuis* but is distinguished from these species by the smaller eyes,

strongly convex frons, brachypterous female, and male genitalia with the following characteristics: genital capsule without tubercle above base of left paramere (fig. 270a); sensory lobe of left paramere prominent, with large spine arising from dorsal surface (fig. 270b); angle of left paramere sharply V-shaped; right paramere with two strong spines dorsally (fig. 270d); vesica with two elongate membranous lobes, right lobe bifurcate; and elongate sclerotized process with strongly reflexed margins (fig. 270e).

DESCRIPTION: *Male*. Length 6.16–6.80; width 1.89–2.20; pale gray ground color with fuscous markings. **Head:** width across eyes 0.95–0.97, vertex 0.38–0.40; pale grayish white with dark reddish brown or fuscous markings; frons strongly convex, with 6–8 fuscous striae laterally; length of eye only slightly greater than width of vertex. **Rostrum:** length 2.50–2.74, reaching between 5th and 7th abdominal segments. **Antennae:** I, length 1.08–1.17, fuscous with large white maculae dorsally; ventral surface pale; II, length 2.14–2.30, yellowish brown with narrow pale annulus at base; III, length 1.42–1.53, dark yellowish brown to fuscous, narrowly pale at base; IV, length 0.99–1.08, brown to fuscous. **Pronotum:** mesal length 0.79–0.86, posterior width 1.39–1.58; disk gray or grayish white, variously tinged with fuscous, posterior submargin with fuscous band and 4–6 weakly elevated points; dorsal surface of collar fuscous with pale spot medially; calli and region immediately behind calli marked with fuscous; propleura fuscous, apical third pale. **Scutellum:** pale yellow or grayish yellow with fuscous markings, usually lightly tinged with brown. **Hemelytra:** grayish white or pale gray with dark spots at bases of simple setae, and larger fuscous maculae particularly along veins, inner and outer margins of corium, and on cuneus; outer half of clavus and inner margin of corium often extensively darkened; apex of corium with large pale patch medially; cuneus densely mottled with fuscous, apical fourth entirely darkened; membrane moderately to densely conspurcate. **Legs:** femora white or pale yellow, reticulated with fuscous mostly on distal two-thirds, dark regions often broken by pale spots; tibiae pale with fuscous markings; front and middle tibiae with three dark annuli, bands on middle tibiae sometimes obscured.

Vestiture: dorsum with long, black, simple setae and silvery white sericeous setae; sometimes also with limited black scalelike setae especially on darkened apical region of corium. **Genitalia:** Figure 270. Genital capsule without tubercles above paramere bases.

Female. Strongly brachypterous, wing membrane reduced to narrow flap. Similar to male in color and vestiture. Length 3.78–4.70, width 1.82–2.05. **Head:** width across eyes 0.93–1.00, vertex 0.44–0.48. **Rostrum:** length 2.68–2.84, reaching base of ovipositor or slightly beyond. **Antennae:** I, 1.08–1.26; II, 2.07–2.32; III, 1.33–1.55; IV, 1.06–1.12. **Pronotum:** mesal length 0.67–0.72, posterior width 1.06–1.22.

ETYMOLOGY: Named for my good friend Paul W. Oman, Professor Emeritus, Oregon State University. Paul is an accomplished systematist, well known for his work on the Auchenorrhynchos Homoptera, particularly the Cicadellidae.

DISCUSSION: *Phytocoris omani* has been collected in eastern Washington, southern Idaho, Utah, and northwestern Colorado on *Artemisia tridentata* Nutt.

ADDITIONAL SPECIMENS: 43 specimens were examined from the following localities: COLORADO. **Grand Co.:** Tabernash (USNM). **Moffat Co.:** Escalante Overlook, 8.1 mi N Rt. 40 on Harpers Corner Rd., 2350 m (AMNH). IDAHO. **Oneida Co.:** Holbrook (USU); 5 mi NW Holbrook (USU). UTAH. **Carbon Co.:** Minnie Maud Crk., 51.8 mi SW Myton, 1980 m (AMNH). **Sevier Co.:** Fishlake Nat. For., T26S R3E Sec. 22, 2350 m (OSU); Salt Gulch, 12 mi N St. Hwy. 24 on St. Hwy. 72, 2460 m (OSU); 24.7 mi N St. Hwy. 24 on St. Hwy. 72, 2425 m (OSU); 2.3 mi N Int. 70 on Rd. to Kanosh, 2130 m (OSU); 2.4 mi S Int. 70 on Kanosh Rd., 2181 m (AMNH). **Uintah Co.:** Kane Hollow on Red Cloud Loop, T1S R21E, 2590 m (AMNH); 5–10 mi SW Bonanza, 1525–1710 m (AMNH). WASHINGTON. **Yakima Co.:** Yakima (USNM). Collection dates are from June 2 to July 17.

Phytocoris roseotinctus Knight

Figure 271

Phytocoris roseotinctus Knight, 1925a: 52, 53. – Carvalho, 1959: 214. – Knight, 1968: 228.

TYPES: Described from two males collected

in the Sierrita Mts., 1220 m, Pima Co., Arizona, 19 August 1924, ex. *Acacia* sp., A. A. Nichol. Both specimens are deposited in the Knight Collection (USNM).

DIAGNOSIS: Recognized by the greenish yellow or pale green general coloration with the inner half of clavus bordering scutellum, outer margin of clavus, inner margin of corium, and paracuneus bright red. The legs and antennae are pale brownish yellow or greenish yellow.

REDESCRIPTION: Length 6.7–7.6. **Head:** pale greenish yellow, vertex and frons usually pure yellow; frons strongly convex, meeting tylus along deep depression. **Antennae:** I, greenish yellow or pale green, length considerably greater than width of head across eyes; II–IV, pale brownish yellow. **Pronotum:** disk yellowish green, collar and calli usually lighter yellow or greenish yellow; propleura uniformly greenish yellow. **Scutellum:** uniformly greenish yellow, sometimes lightly tinged with red medially. **Hemelytra:** greenish yellow or pale green; inner half of clavus bordering scutellum, narrow outer margin of clavus, broader inner margin of corium, and paracuneus bright red; membrane densely mottled with spots and larger maculae of brown or fuscous. **Legs:** femora pale brownish yellow or greenish yellow with faint brown reticulations mostly on apical half; hind femora usually with pale spots; tibiae pale yellow or greenish yellow, apices darker brownish yellow. **Vestiture:** dorsum with pale, simple setae and silvery white, sericeous setae. **Male genitalia:** Figure 271.

DISCUSSION: *Phytocoris roseotinctus* is known from Cochise, Pima, and Santa Cruz counties in Arizona. Knight (1968) reported this species from New Mexico, but did not give a specific locality. The holotype and single paratype were collected on *Acacia* sp. Both sexes have been taken at light. I have examined 25 specimens from the following localities: **ARIZONA.** **Cochise Co.:** Douglas (UCB); Huachuca, Sunnyside (UAZ). **Pima Co.:** Santa Rita Mts.: Madera Cyn. (NAU, UAZ); McCleary Cyn. (UAZ); Ridge Area, Sec. 24, 1645 m (UAZ). **Santa Cruz Co.:** Atascosa (USNM); Atascosa Lookout, Atascosa Mt., 1680 m (UAZ); Nogales (UAZ, USNM); Patagonia (UCR). Collection dates are from August 9 to October 9.

Externally, *roseotinctus* is very similar to

vigens (Uhler), but differs by the structure of the male genitalia and clavus only partially reddened. The distribution of *vigens* seems to be restricted to Baja California, Mexico.

Phytocoris shoshoni, new species

Figure 272

HOLOTYPE MALE: Balanced Rock Viewpoint, Colorado National Mon., 6000 ft (1830 m), Mesa Co., Colorado, 10 June 1982, ex. *Pinus edulis* Engelm., M. D. Schwartz (AMNH).

PARATYPES: COLORADO. Chaffee Co.: 1 male, 2 females, Maysville, 12 mi W Salida, 8 September 1984, D. A. and J. T. Polhemus (JTP); 2 males, Old Midland Drive, E of Buena Vista, 7 September 1981, J. T. and D. A. Polhemus (JTP); 1 male, 5 mi W Buena Vista, 25 July 1982, J. T. Polhemus (JTP); 2 males, 10 mi N Salida, 9 September 1984, J. T. Polhemus (JTP). **Eagle Co.:** 2 males (one specimen with abdomen missing), Water Wheel Ranch, nr. Bond, 24 June 1978, J. T. Polhemus (JTP). **Las Animas Co.:** 1 female, Stonewall, 2440 m, 28 August 1982, J. T. Polhemus (JTP). **Pitkin Co.:** 1 male, nr. Redstone, 8 July 1980, ex. *Pinus edulis*, J. T. and D. A. Polhemus (JTP). **Pueblo Co.:** 1 female, 12 mi W Pueblo on St. Hwy. 96, 15 June 1980, J. T. and D. A. Polhemus (JTP). **TEXAS. Pecos Co.:** 7 males, 6 females, 36 mi S Ft. Stockton, 1370 m, 2 May 1982, ex. *Pinus edulis*, D. A. and J. T. Polhemus (JTP). **UTAH. Grand Co.:** 3 males, 3 females, South Beaver Mesa, La Sal Mtns., 4 July 1980, J. T. and D. A. Polhemus (JTP); 3 males, 4 females, 11 mi SE Jct. Rd. 163 on Rd. 313 (Rd. to Dead Horse Pt.), 1585 m, 11 June 1982, ex. *Pinus edulis*, M. D. Schwartz (AMNH). **San Juan Co.:** 3 males, Natural Bridges Nat. Mon. (at campground), 1980 m, 17 June 1983, ex. *Pinus edulis*, R. T. Schuh and M. D. Schwartz (AMNH); 2 males, 5 females, 2.7 mi W of Rt. 95 on Rt. 263, T37S R17E, 1830 m, 18 June 1983, ex. *Pinus edulis*, R. T. Schuh and M. D. Schwartz (AMNH); 1 male, 1 female, 19 mi N Mexican Hat on Rt. 261, T39S R18E, 1980 m, 17 June 1983, ex. *Pinus edulis*, R. T. Schuh and M. D. Schwartz (AMNH).

DIAGNOSIS: *Phytocoris shoshoni* closely resembles *chihuahuanae* and *simulatus* of the *fraterculus* group, but is distinguished by the

absence of dark annuli on the front tibiae, dorsum without dark scalelike setae, and by the structure of the male genitalia (fig. 272). The fuscous third antennal segment, dark markings along posterior submargin of pronotal disk, and the male genitalia distinguish *shoshoni* from *mellarius*, an externally similar species also inhabiting *P. edulis*.

DESCRIPTION: *Male.* Length 5.45–6.00, width 1.80–1.85; brownish yellow general coloration with limited fuscous markings. **Head:** width across eyes 0.94–0.97, vertex 0.29–0.32; pale yellow; buccula, jugum, lorum, and tylus marked with red; frons weakly convex, with five or six faint reddish striae laterally. **Rostrum:** length 2.65–2.81, reaching seventh or eighth abdominal segment. **Antennae:** I, length 0.63–0.72, pale yellow, dorsal surface with reddish brown or fuscous reticulations; II, length 2.11–2.30, yellowish brown, apical fourth fuscous; III, length 1.12–1.26, fuscous, narrowly pale at base; IV, length 0.85–0.88, fuscous. **Pronotum:** mesal length 0.81–0.86, posterior width 1.48–1.57; disk pale yellow or brownish yellow, posterior submargin with fuscous band or series of fuscous patches; collar and calli usually lightly tinged with brownish orange; propleura pale, sometimes with red mark crossing anterior margin. **Scutellum:** pale yellow, sometimes lightly tinged with brown. **Hemelytra:** pale yellow, lightly tinged with brown; apical half of corium sometimes with faint reddish tinge medially; outer margin of clavus, basal third of corium, and inner margin of corium with fuscous markings; inner margin and apex of cuneus usually marked with red; membrane uniformly darkened or nearly so. **Legs:** femora pale yellow, with red to brown spots and reticulations mostly on distal half; tibiae pale with limited brown to fuscous markings, without dark annuli. **Vestiture:** dorsum with golden to dark brown, simple setae and silvery white, sericeous setae. **Genitalia:** Figure 272. Genital capsule with small knoblike tubercle above base of left paramere.

Female. Similar to male in color, vestiture, and structure. Length 5.56–5.72, width 1.84–1.96. **Head:** width across eyes 0.92–0.97, vertex 0.36. **Rostrum:** length 2.66–2.92, reaching well beyond apices of hind coxae. **Antennae:** I, 0.67–0.76; II, 2.02–2.29; III, 1.13–1.21; IV,

0.79–0.90. **Pronotum:** mesal length 0.77–0.88, posterior width 1.49–1.62.

ETYMOLOGY: Named for the Shoshoni Indians; a noun in apposition.

DISCUSSION: *Phytocoris shoshoni* has been collected in Colorado, eastern Utah, and western Texas on *Pinus edulis* Engelm. Collection dates are from May 2 to September 9. Although *shoshoni* is very similar to certain members of the *fraterculus* group in external appearance, it shows no relationship to these species with regard to the structure of the male genitalia.

Phytocoris varipes Boheman

Figures 260, 273

Phytocoris varipes Boheman, 1852: 107. – Butler, 1923: 387. – Kullenberg, 1944: 26–29, pl. II, fig. 8. – Carvalho, 1959: 225 (see this catalog for complete listing of pre-1959 citations). – Southwood and Leston, 1959: 298, figs. 124, 137, pl. 51, fig. 6. – Wagner and Weber, 1964: 148, figs. 96d, 97d, 100d, 102a–c. – Wagner, 1971: 231, 232, figs. 151a, b, 154a, 166b, f, k, o. – Stonedahl, 1983a: 465–467, figs. 6–10.

DIAGNOSIS: *Phytocoris varipes* is distinguished from other western *Phytocoris* species by the following combination of characters: brownish yellow general coloration; dorsum without dark scalelike setae; ratio of eye length to width of vertex less than 1.20:1; antennae pale yellow or brownish yellow, segment I slightly longer than width of head across eyes; front tibiae with three red or reddish brown annuli; anterior margin of male genital aperture with well-developed tubercle in addition to tubercles above paramere bases (fig. 273a, f); sclerotized process of vesica with 10 or 11 marginal serrations (fig. 273e).

REDESCRIPTION: Length 5.6–7.3. **Head:** pale brownish yellow with red markings; frons moderately convex, with several reddish striae laterally. **Antennae:** pale yellow or brownish yellow; segment I reticulated with reddish brown. **Pronotum:** disk brownish yellow or grayish yellow, usually darker brown along posterior submargin; collar with faint red mark bordering pale median spot; propleura pale with broad reddish brown band across middle and narrower band on dorsal margin. **Scutellum:** pale yellow or brownish yellow, sometimes lightly tinged with red; median

line pale, bordered by reddish brown to fuscous. **Hemelytra:** pale brownish yellow, often with faint reddish cast; clavus and inner apical region of corium marked with darker brown; outer margin of corium and cuneus with red or reddish brown markings; membrane mottled with fuscous. **Legs:** femora pale yellow, reticulated with red or reddish brown; tibiae pale yellow or brownish yellow; front tibiae with three reddish brown or fuscous annuli, bands sometimes obscured. **Vestiture:** dorsum with golden to dark brown, simple setae and silvery white to golden brown, sericeous setae. **Male genitalia:** Figure 273.

DISCUSSION: *Phytocoris varipes* is a Palearctic species found throughout the British Isles and continental Europe except the extreme northern regions. This species also has been reported from Algeria, Turkestan, and the Bol'shoy Kavkaz Mts. in southwestern USSR (Butler, 1923; Wagner, 1971). In Europe, *varipes* occurs on a variety of grasses and herbs and is reported to be principally phytophagous (Kullenberg, 1944; Southwood and Leston, 1959). Adults are found from mid-June to October.

This species was first reported from North America by Stonedahl (1983a). It is distributed throughout much of western Oregon at low elevations on mixed grasses and herbs. The present distribution extends from Curry County north to Polk and Marion counties. I have examined 210 specimens with collection dates from June 21 to October 17.

Externally, *varipes* is most similar to a native grass-inhabiting species, *roseipennis*, but differs by the smaller size, dark annuli on the front tibiae, macropterous female, and structure of the male genitalia, especially the well-developed tubercle on the anterior margin of the genital aperture (fig. 273f).

Phytocoris varius Knight

Figure 274

Phytocoris varius Knight, 1934: 9–11. – Carvalho, 1959: 220. – Knight, 1968: 235, fig. 281.

TYPES: Described from 10 specimens collected in Arizona and southeastern Colorado. The male holotype, allotype, and four paratypes were taken at Grand Canyon, Coconino Co., Arizona, 6 September 1931, ex. *Junip-*

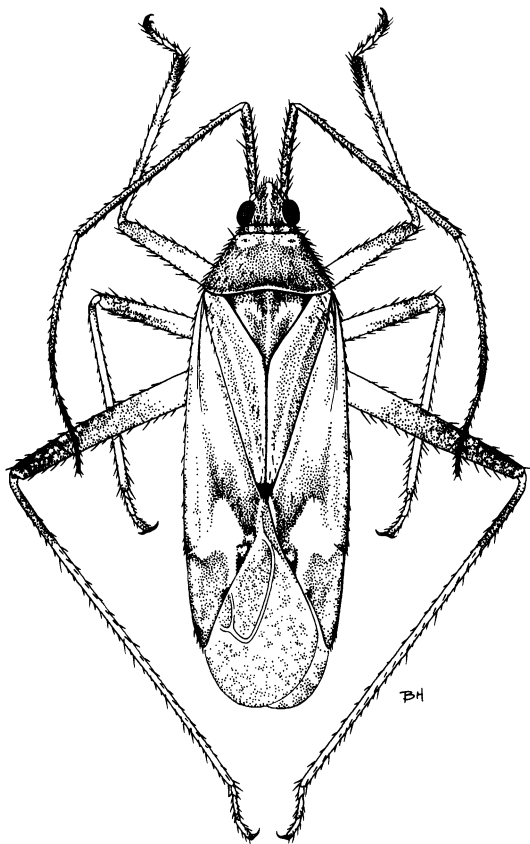


Fig. 260. *Phytocoris varipes*, dorsal habitus of male.

erus sp., H. H. Knight. All type material is retained in the Knight collection; two paratypes were not located.

DIAGNOSIS: *Phytocoris varius* is recognized by the following combination of characters: pale grayish brown general coloration; ratio of eye length to width of vertex greater than 1.10:1 for males and 1.00:1 for females; antennal segment I slightly longer than width of head across eyes; antennal segment II nearly twice as long as posterior width of pronotum; front tibiae without dark annuli; propleura fuscous, apical third and stripe across dorsal half pale. Externally, this species closely resembles *inops* and *schuhi* of the *fraterculus* group, but differs by the smaller size, absence of dark annuli on the front tibiae, and structure of the male genitalia (fig. 274).

REDESCRIPTION: Length 5.8–6.7; pale gray or brownish gray general coloration with lim-

ited fuscous markings. **Head:** pale yellow; jugum, lorum, and tylus moderately to extensively darkened; frons weakly convex, with 6–8 faint, red to fuscous striae laterally; tylus prominent. **Antennae:** I, pale yellow with reddish brown to fuscous spots and reticulations dorsally, ventral surface darkened basally; II, brownish yellow; III and IV, yellowish brown to fuscous. **Pronotum:** disk pale yellow or grayish yellow, lateral margins and posterior submargin darker brown, extreme posterior margin pale; disk with dark spots at setal bases; lateral spots on collar and inner margins of calli fuscous; propleura fuscous, apical third and stripe across dorsal half pale. **Scutellum:** mostly fuscous, lateral margins and median line on distal half pale. **Hemelytra:** grayish white or grayish yellow with limited fuscous markings mostly along veins, outer margin of corium, and inner margin of cuneus; clavus and corium with dark spots at bases of simple setae; membrane conspurcate. **Legs:** femora white or pale yellow with reddish brown or fuscous reticulations; hind femora extensively darkened on dorsal surface, with limited pale spots; tibiae pale with reddish brown or fuscous spots mostly on basal half. **Vestiture:** dorsum with dark simple setae, silvery white sericeous setae, and black scalelike setae. **Male genitalia:** Figure 274.

DISCUSSION: 24 specimens were examined from the following localities: **ARIZONA.** **Apache Co.:** 5 mi SW Springerville (AMNH). **Cochise Co.:** SW Rsrh. Stn., nr. Portal, 1500 m (AMNH). **Coconino Co.:** Grand Canyon (USNM). **Santa Cruz Co.:** Santa Rita Mts. (USNM). **COLORADO.** **Montrose Co.:** 18 mi SE Naturita (JTP). **NEVADA.** **White Pine Co.:** Little Antelope Summit on St. Hwy. 50, 2270 m (AMNH). **TEXAS.** **Brewster Co.:** Green Gluch, Big Bend Nat. Pk., 1740 m (TA&M). **MEXICO.** **Sonora:** 11 mi E Mai-cora (JTP). Collection dates are from June 10 to September 6. The host plant of this species is *Juniperus*.

Phytocoris vau Van Duzee

Figure 275

Phytocoris vau Van Duzee, 1912: 478; 1914: 15; 1917a: 318. – Carvalho, 1959: 220. – Knight, 1968: 249.

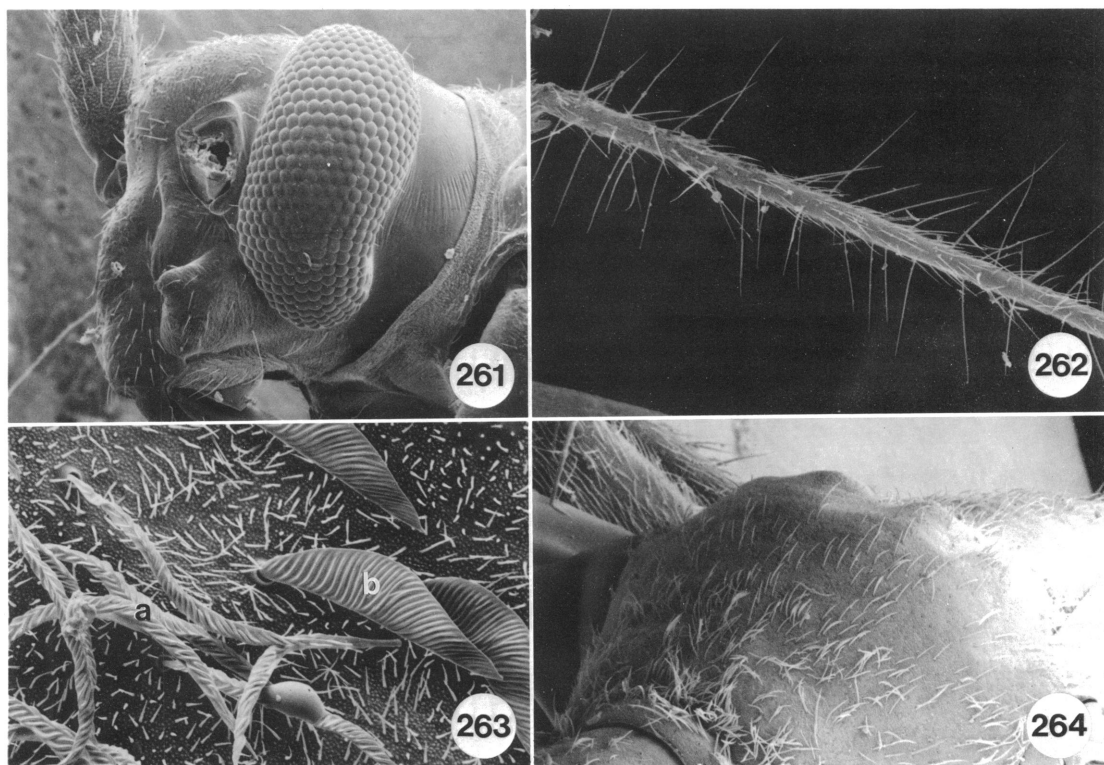
TYPES: Described from a single male taken at Pasadena, Riverside Co., California, 17

June 1909, F. Grinnell. The holotype (no. 1997) is deposited in the Van Duzee Collection (CAS).

DIAGNOSIS: This striking species is readily recognized by the yellowish green hemelytra with the clavus, inner apical angle of corium, and inner margin and apex of cuneus deep ruby red to dark brownish red; legs and antennae also extensively reddened.

REDESCRIPTION: Length 5.2–6.0. **Head:** pale greenish yellow; jugum, lorum, buccula, and tylus red; frons strongly convex, meeting tylus along deep depression. **Antennae:** deep ruby red to dark reddish brown; segment I with pale spots dorsally and laterally; segment II with pale annulus at base and broader pale band medially; segment III narrowly pale at base. **Pronotum:** disk and propleura uniformly yellowish green, calli sometimes lighter yellow. **Scutellum:** uniformly yellowish green; weakly convex. **Hemelytra:** yellowish green; clavus, inner apical angle of corium, and inner margin and apex of cuneus deep ruby red to dark brownish red; cuneus usually paler greenish yellow; membrane densely mottled with fuscous spots (Note: the bright yellowish green color of this species fades to pale brownish yellow with age). **Legs:** femora brownish yellow with extensive, fine reticulate pattern of red, also marked with faint pale spots; front tibiae uniformly rubescent; middle and hind tibiae pale with broad red annulus at base, middle tibiae also narrowly reddened at apex. **Vestiture:** dorsum with golden sericeous setae on greenish areas, silvery white sericeous setae on reddened areas, and uniformly distributed, golden to dark brown, simple setae. **Male genitalia:** Figure 275.

DISCUSSION: *Phytocoris vau* is distributed in the chaparral zone of southwestern California from San Diego County north to Los Angeles County. The host plant of this species is *Adenostoma fasciculatum* H.&A. Both sexes have been taken at light. I have examined 50 specimens from the following localities: **CALIFORNIA:** **Los Angeles Co.:** Bouquet Cyn. (LACM); Los Angeles (USNM). **Riverside Co.:** 1 mi S Bundy Cyn., nr. Menifee Valley (UCR); Palm Cyn., 5 mi S Palm Spgs. (UCR). **San Diego Co.:** Buckman Spgs. (SDNH); W of Jacumba (USNM); Palomar (SDNH); Pine Valley (SDNH, USNM); unspecified locality (CAS). **Unspecified Co.:** Ly-



Figs. 261–264. *Phytocoris* species. 261. *laevis*, lateral view of head. 262. *lycii*, second antennal segment of female. 263. *lycii*, dorsal vestiture: a, white sericeous setae; b, black scalelike setae. 264. *becki*, anterodorsal view of pronotum.

tle Crk. Wash (UCB, UCR). MEXICO. Baja California Norte: 22 and 41 km W Parque San Pedro Martir (AMNH). Collection dates are from May 2 to August 1.

Phytocoris vinaceus Van Duzee

Figure 276

Phytocoris vinaceus Van Duzee, 1917b: 263. – Carvalho, 1959: 221. – Knight 1968: 249.

Phytocoris hyampom Bliven, 1966: 115, pl. X, figs. 6, 7. NEW SYNONYMY.

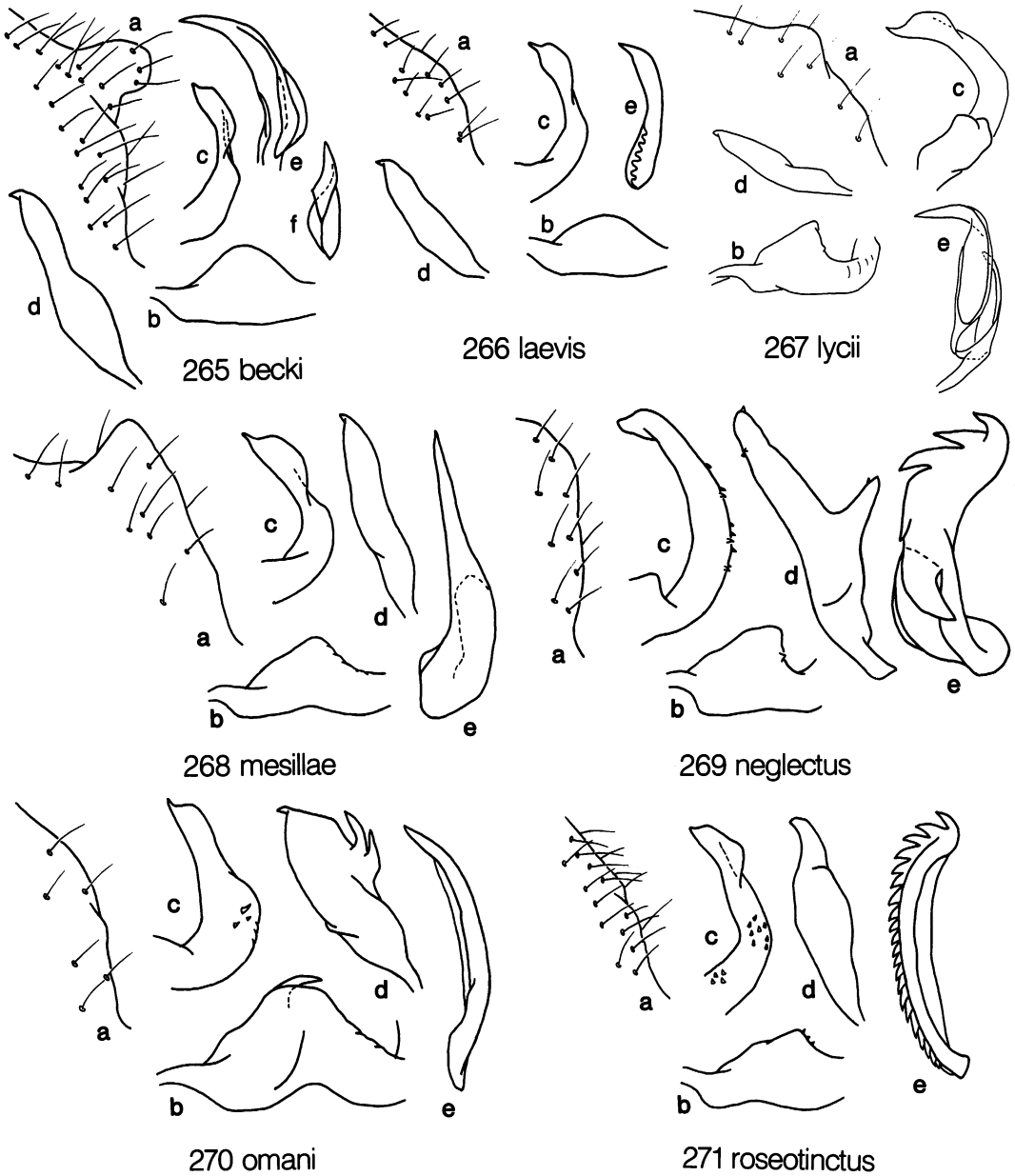
TYPES: *Phytocoris vinaceus* was described from an unspecified number of specimens collected in California by E. P. Van Duzee, W. M. Giffard, and F. Grinnell. The male holotype (no. 334), allotype (no. 335), and six paratypes (two nymphs) were taken near Hobergs, Lake Co., 2–3 August 1916. These specimens are retained in the Van Duzee Collection (CAS), except one female paratype deposited in the Knight Collection (USNM). Ten additional paratypes including three

nymphs were examined from Lake, Placer, Riverside, and Sonoma counties; all are deposited in the Van Duzee Collection (CAS).

The junior synonym, *hyampom*, was described from nine specimens collected along the Van Duzee Road, Trinity Co., California, July and August, ex. *Arctostaphylos*, B. P. Bliven. The male holotype, 4 August 1957 (no. 13874); allotype, 12 August 1951 (no. 13874); and all seven paratypes are deposited in the collection of the CAS.

DIAGNOSIS: *Phytocoris vinaceus* is distinguished from other species of the genus in western North America by the nearly uniform deep wine red general coloration of the body and legs. Externally, this species is most similar to *nicholi* of the *rostratus* group but differs by the deeper red coloration of the pronotum and hemelytra, and by the structure of the male genitalia (fig. 276).

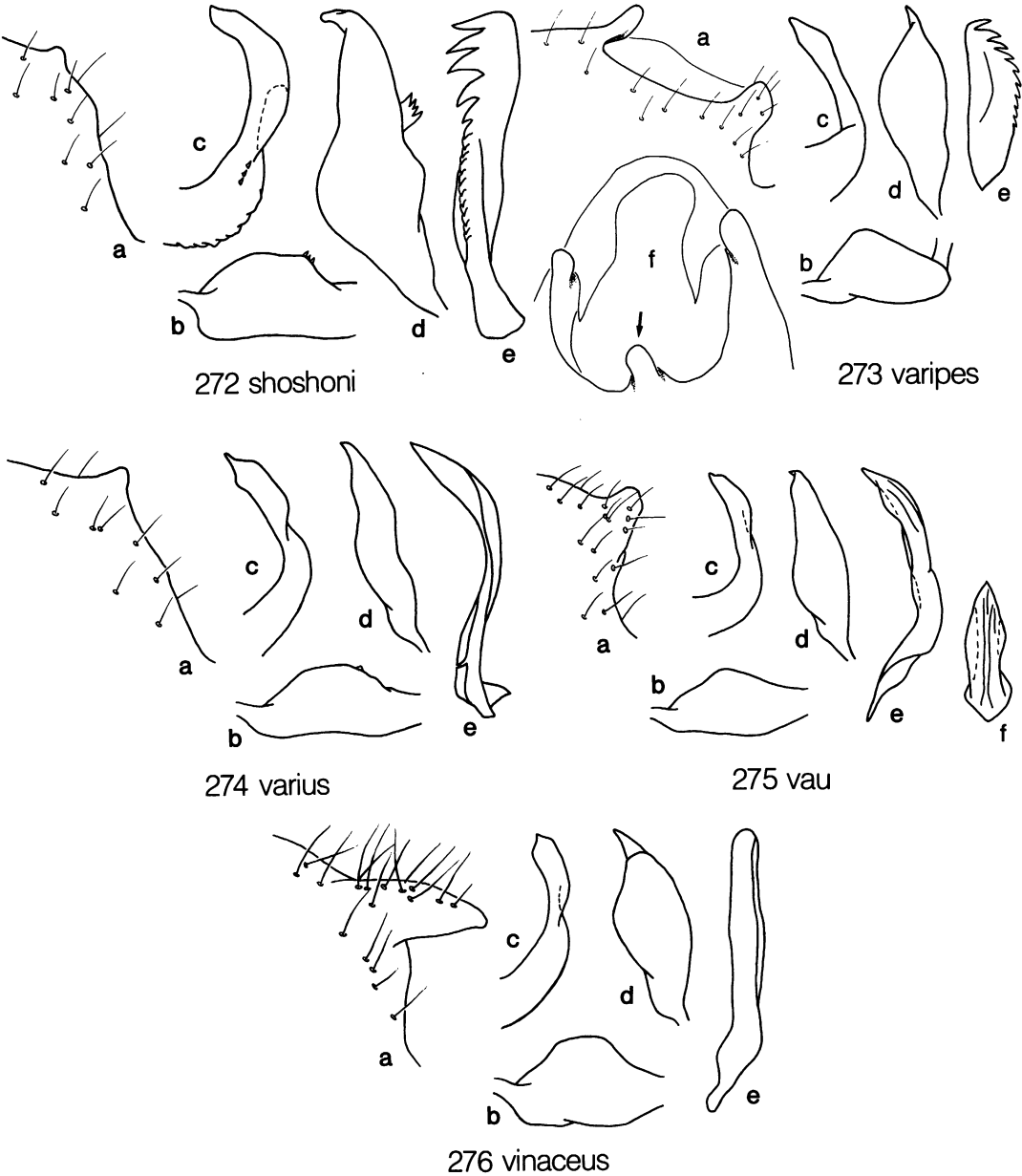
REDESCRIPTION: Length 4.9–6.2; deep red general coloration. **Head:** red, frons usually



Figs. 265–271. Male genitalia of *Phytocoris* species with uncertain group affiliation. a. Left dorso-lateral margin of genital capsule. b. Arm of left clasper, lateral view. c. Shaft of left clasper, dorsal view. d. Right clasper, lateral view. e. Sclerotized process of vesica, or left sclerotized process for *becki*. f. Right sclerotized process of vesica for *becki*.

more grayish yellow with red tinge; frons moderately convex, meeting tylus along shallow depression. **Antennae:** I, dark red or reddish brown with pale spots on dorsal aspect; II and III, reddish brown or fuscous with pale

annulus at base and middle; IV, fuscous. **Pronotum:** disk brownish yellow, moderately to extensively suffused with red or reddish brown, sometimes fuscous along posterior submargin; calli grayish yellow, usually only



Figs. 272–276. Male genitalia of *Phytocoris* species with uncertain group affiliation. **a.** Left dorso-lateral margin of genital capsule. **b.** Arm of left clasper, lateral view. **c.** Shaft of left clasper, dorsal. **d.** Right clasper, lateral view. **e.** Sclerotized process of vesica, or left sclerotized process for *vau*. **f.** Dorsal view of genital capsule for *varipes*; right sclerotized process of vesica for *vau*.

lightly tinged with red; propleura brownish yellow, moderately to intensely tinged with red. **Scutellum and Hemelytra:** uniformly dark red, often with yellowish cast; wing membrane uniformly darkened, sometimes with

limited pale spots, veins red. **Legs:** femora dark red or reddish brown, usually darkest near apex and marked with pale spots; tibiae dark red or reddish brown with pale spots, front pair with three pale annuli. **Vestiture:**

dorsum with dark simple setae, black scale-like setae, and sparsely distributed, white, scalelike setae. **Male genitalia:** Figure 276.

DISCUSSION: *Phytocoris vinaceus* is widely distributed in the coastal mountain ranges and Sierra Nevada Mts. of California, north to Curry, Josephine, Jackson, and Klamath counties in Oregon. A single specimen also was seen from Chelan Co., Washington suggesting a northward extension of the distribution along the eastern slopes of the Cascade Range. The southernmost record is from San Diego Co. in California. The host plant is *Arctostaphylos*. I have examined 110 speci-

mens with collection dates from May 8 to September 23.

Based on the structure of the male genitalia (e.g., elongate basal process, simple sclerotized process, cylindrical left genital tubercle with bristlelike setae on dorsal surface), this species appears to be most closely related to members of the *conspurcatus* and *juniperanus* groups. However, *vinaceus* is much larger than most species of the *juniperanus* group, and lacks the sclerotized regions on the membranous lobes of the vesica that are characteristic of *conspurcatus* group species.

APPENDIX

Synapomorphies of the Species-Groups of Western North American *Phytocoris*

Aurora Group

- Genital capsule with broad, dorsally directed tubercles above paramere bases.
- Arm of left paramere with large, knoblike or spinelike process dorsally.
- Right paramere with spinelike process or series of prominent spines on inner-dorsal surface.

Candidus Group

- Venter with dense covering of broad, scalelike setae.
- Sclerotized process of vesica coiled basally.

Carnosulus Group

- Basal region of hind femora greatly expanded.
- Vesica with small sclerotized protuberance above posterior margin of secondary gonopore.

Conspurcatus Group

- Genital capsule with long, tapered, posterodorsally directed tubercles above paramere bases.
- Vesica with large, flattened, usually lance-shaped sclerotized process.
- Primary membranous sac of vesica with extensive sclerotization basally, and broadly distributed spines distally.

Cunealis Group

- Vesica with three or four large, usually curved or twisted, sclerotized processes.

Fraterculus Group

- Sensory lobe of left paramere with weakly carinate dorsal margin.
- Right paramere with row of small spines or stout tubercles on inner-dorsal surface.
- Sclerotized process of vesica bulbous basally, with flattened, tapered distal region.

Hopi Group

- Vesica with one or two, large, weakly to strongly curved sclerotized processes; margins of process usually strongly reflexed.

Interspersus Group

- Scutellum with round, dark spot either side before apex.
- Left paramere with basal region of shaft strongly swollen.

Junceus Group

- Elongate, weakly to moderately curved right paramere.
- Outer surface of shaft of left paramere with small, flattened protuberance basomedially.
- Primary membranous sac of vesica with small, spinose patch above left margin of gonopore.
- Sclerotized process of vesica with strong medial ridge, bordered laterally by deep depression; outer margin of process with 7–15 coarse serrations.

Juniperanus Group

- Genital capsule with blunt, usually cylindrical tubercles above paramere bases; dorsal surface of tubercle usually set with stout, bristlelike setae.
- Vesica with small, blade- or teardrop-shaped sclerotized process.

Lasiomerus Group

- Antennal segment I moderately inflated, densely set with erect, bristlelike setae.
- Short, comblike sclerotized process of vesica with 20–25 small serrations; process broadly attached to right lobe of primary membranous sac.
- Right basal lobe of vesica with weakly sclerotized outer surface.

Listi Group

- Head with lorum and jugum equally swollen.
- Dorsum with sparsely distributed, erect, black, bristlelike setae, mostly along veins of hemelytra.
- Left primary lobe of vesica usually with horn- or platelike lobal sclerite distally.
- Sclerotized process of vesica with weakly to moderately developed medial ridge; outer margin of process with 9–15 strong serrations.

Plenus Group (see Discussion section for *plenus* group)*Pulchellus* Group

- Sclerotized process of vesica broad basally, not or only slightly narrowed distally, with 6–14 broad serrations distributed along entire outer margin, broadly attached along inner margin to primary membranous sac.

Pulchricollis Group

- Venter densely covered with appressed, narrow, scalelike setae.
- Vesica with two sclerotized processes; right process ladle-shaped with broadly opened, cuplike basal region, and tapered, flattened distal region; left process straplike.

Roseipennis Group

- Elongate head with small, weakly protruding eyes, and especially broad vertex.
- Vesica with one or two sclerotized processes; right process large, broadly curved, with strongly reflexed margins.

Rostratus Group

- Vesica with two sclerotized processes; right process strongly curved distad of prominent basal support, distal bladelike portion elongate or lanceolate, usually with 2–4 ridges arising from central shaft.

Stellatus Group

- Left paramere with weakly produced sensory lobe, and short shaft with laterally flattened distal region and strongly reflexed dorsal margin.
- Sclerotized process of vesica very small, broadened distally, with 2–7 toothlike, marginal serrations.

Tenuis Group

- Dorsum usually with scattered, dark brown or black, sericeous setae, mostly restricted to posterior third of corium.
- Vesica with elongate, unilobal or weakly bi- or trilobed primary membranous sac, and strongly developed basal lobes; left basal lobe with patch of spinulae or weakly sclerotized region lacking spinulae.

Tiliae Group

- Shaft of left paramere with weakly expanded outer-distal margin, and moderately to broadly rounded apex, without narrowed apical process.
- Sclerotized process of vesica elongate, comblike, with deep medial furrow, and 20–30 small, marginal serrations; process broadly attached to right lobe of primary membranous sac.

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