Revision of the North American Plant Bug Genus *Megalopsallus* Knight, with the Description of Eight New Species from the West (Heteroptera: Miridae: Phylinae)

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ABSTRACT

*Megalopsallus* Knight is revised, with 29 valid species recognized; 8 species are described as new and 13 previously described species are newly treated as junior synonyms. *Merinocapsus* Knight is treated as a junior synonym of *Megalopsallus*. The species *Europiella albipubscens* Knight and *Europiella monticola* Knight, formerly placed in *Megalopsallus* are treated as incertae sedis and belonging to *Europiella*, respectively. Habitus and male genitalic illustrations are provided for all *Megalopsallus* species; scanning micrographs of the head, scent-gland evaporatory area, vestiture, and pretarsus are included for selected species. A key to males is presented. The majority of *Megalopsallus* spp. are recorded from dry interior portions of the American West; two species are recorded from the Gulf Coast and East Coast of the United States. Host information is presented for most species, indicating an obligate association with halophytes, most in the families Ephedraceae (Ephedrales) and Chenopodiaceae and Solanaceae (Angiospermae). The relationships of *Megalopsallus* within the Phylini are discussed.

INTRODUCTION

Knight (1927) described *Megalopsallus*, with five included species, designating *atriplicis* Knight from the Texas Gulf Coast as the type. Later, Knight (1968) described numerous species in the genus *Europiella* Reuter, many of which were subsequently moved to *Megalopsallus* by Schuh et al. (1995), on
the basis of male genitalic structure. The latter authors did not, however, deal with issues of synonymy and description of new taxa within *Megalopsallus*.

Knight (1968) described *Merinocapsus*, with a single included species. Schuh (1986) later described an additional new species in *Merinocapsus* and treated *Ankylotylus* Knight, 1968, with a single included species, as a junior synonym.

The present paper provides a detailed revision of *Megalopsallus*, with a total of 29 valid species of these relatively colorful bugs; three of those species were previously placed in *Merinocapsus* Knight. Thirteen pre-existing names are treated as junior synonyms, eight species are described as new, habitus and genitalic illustrations are provided for all species, scanning micrographs are provided for some structures from selected species, and a key to species is presented.

The relationships of *Megalopsallus* to other groups within the Phylini are discussed. Although many of the species here placed in *Megalopsallus* were originally described in *Europiella* by Knight, primarily on the basis of pretarsal structure (Knight, 1968), the morphology of the male genitalia and other structures offers no suggestion of a close relationship between the two groups. The pulvilli show considerable size variation in *Megalopsallus*, similar to that seen in *Atractotomus* Fieber (Stonedahl, 1990), and are therefore of little use in diagnosing the group. Contrary to Knight’s (1927) original characterization, the pulvilli (pseudarolia of Knight) are not “entirely absent,” but range from small and *Plagiognathus*-like (fig. 17) to greatly enlarged and covering much of the ventral claw surface (fig. 18).

Hosts are documented for nearly all of the included species. The massive number of available host records allows for plant-insect associations to be critically assessed. It is now clear on which plant species most *Megalopsallus* species breed, as well as on which plant species they do not breed. Although host fidelity is not absolute in all species, it is shown to be very strong for most.

The habitus photographs are not all reproduced at a comparable scale. Thus, relative sizes of the taxa should not be assessed by comparing the figures. Detailed measurements for all species are given in table 1, and these data should be used for making size comparisons. All measurements are given in millimeters. Species treatments are presented in alphabetical order.

*Megalopsallus* Knight

*Megalsassus* Knight, 1927: 224 (n. gen).

*Merinocapsus* Knight, 1968: 34 (n. gen.). NEW SYNONYMY.


TYPE SPECIES: *Megalopsallus atriplicis* Knight, 1927.

DIAGNOSIS: Recognized by weakly flattened, lanceolate, silvery or white setae generally distributed on dorsum and thoracic pleuron, intermixed with pale or dark, reclining, simple setae (figs. 1C, 17D), elongate nearly parallel-sided body form in males contrasted with ovate body form of females (figs. 7–12), broad, usually short head in males (figs. 7–12), and small, relatively simple vesica of male genitalia (figs. 13–16) with apex blunt or as a single or bifid, short apical projection, and gonopore sclerite (when present) lacking barbs. Coloration often largely red or green, a few species castaneous, but then appendages often partly to entirely red. Known species feeding on halophytes, primarily members of Ephedraceae, Chenopodiaceae, and Solanaceae.

*Megalopsallus* was confounded by Knight (1968) with *Europiella* Reuter, but is easily distinguished by the more flattened body form in most species, the simpler, more delicate structure and much smaller size of the male genitalia, and the preference for halophytic hosts rather than members of the Asteraceae. Some dark-colored species, such as *knowltoni* and *nigrofemoratus* are similar in appearance to some *Plagiognathus* species, but are always separable by the form of the male genitalia; furthermore, most *Plagiognathus* spp. have only simple setae on the dorsum and elsewhere on the body. The pulvilli are sometimes large and cover most of the ventral claw surface in *Megalopsallus* (figs. 18C, 20D), but see fig. 17E), whereas in *Plagiognathus* the pulvilli are always small and cover only a small area near the base of the claw. As noted above, Knight’s
(1927) characterization of pulvillar structure in *Megalopsallus* was in error.

**Redescription:** Male: Small to moderately large species, total length 2.31–5.20, length apex clypeus–cuneal fracture 1.73–3.31, width across pronotum 0.83–1.32; usually elongate and more or less parallel sided (figs. 7–12). COLORATION AND VESTITURE: Coloration, including all appendages, ranging from totally pale, white, to almost totally black, often greenish or reddish. Vestiture of dorsum comprising reclining or recumbent, pale to dark, simple setae intermixed with white, silvery, or rarely somewhat golden, weakly to moderately flattened, usually lanceolate, sometimes woolly, setae (figs. 7–12), latter type also occurring on thoracic pleuron and abdominal venter. Tibial spines pale or dark, with or without dark spots at bases.

**Structure:** Body form generally somewhat flattened; head broad, short longitudinally and clypeus not visible from above. Eyes sometimes bulging and removed from pronotal margin, more commonly conforming to curvature of frons and to anterior pronotal margin. Antennal segment 2 cylindrical (figs. 5, 6) or more rarely spindle-shaped, especially in females (fig. 23). Hemelytra often elongate to strongly elongate and nearly parallel-sided, abdomen often reaching only to cuneal fracture, less frequently hemelytra not so elongate and body form elongate ovoid. Metathoracic scent-gland evaporatory area as in figs. 1B, 3B, etc.; mesothoracic spiracle with an elongate, conspicuous area of “mushroom bodies” dorsad of spiracle (figs. 3B, 4B). Claws ranging from relatively short and curving only near apex (fig. 1D) to relatively long and slender, smoothly curving over entire length (fig. 17E); pulvilli ranging from minute (fig. 17E) to large and covering nearly entire ventral claw surface (fig. 18C). Abdomen in males flattened dorsoventrally, widely basally and broadly curving and narrowing toward relatively small genital capsule (fig. 17B).

**Male Genitalia:** Genital capsule and genitalia small relative to size of animal (fig. 17B); vesica formed of a single strap usually twisted to form an S shape (figs. 13, *atripli-cis*), more rarely forming a weak coil (fig. 13, *brendae*) or not twisted and in the shape of a J (figs. 16, *punctatus*); apex of vesica often sclerotized and attenuated, as either a single spine or bifid, sometimes membranous; (secondary) gonopore either apical or subapical, occasionally only weakly sclerotized; gonopore sclerite subtending gonopore often present and well sclerotized (figs. 13–16, gs), never with bars as in many *Atractotomus* species; paramere and phallotheca typical of Phylini, without distinctive characteristics (figs. 14–16).

**Female:** Total length 2.28–3.98, length apex clypeus–cuneal fracture 1.74–2.96, width across pronotum 0.96–1.42; often broadly oval to elongate ovoid and of more robust body form than males (figs. 7–12); antennal segment 2 of slightly smaller diameter than in males, sometimes spindle-shaped (fig. 23).

**Discussion:** Comparison of the 29 species here recognized within *Megalopsallus* indicates that the continued treatment of *Merino-capsus* as a separate group almost certainly renders the former group paraphyletic. Therefore, *Merino-capsus* is treated as a junior synonym of *Megalopsallus*.

The affinities of *Megalopsallus* appear to be with *Atractotomus* Fieber, *Knightomiro-ides* Stonedahl and Schwartz, *Phoenicocoris* Reuter, *Pinomiris* Stonedahl and Schwartz, and possibly *Chlamydatus* Curtis, based particularly on the male genitalic structure, the genitalia being relatively small, the vesica being formed of a single strap, and the sub-apical secondary gonopore frequently being subtended by a gonopore sclerite (Kelton, 1965; Stonedahl, 1990; Stonedahl and Schwartz, 1996). Although several *Megalopsallus* species have the gonopore sclerite (figs. 13–16, gs) described by Stonedahl (1990), none have bars on the sclerite. The apex of the vesica in *Megalopsallus* is usually attenuated, in the form of a single, short, simple spine, or is bifid. *Atractotomus*, *Chla-mydatus*, and *Phoenicocoris* are Holarctic in distribution, whereas the other genera are restricted to the Nearctic.

In addition to the above described morphological differences, the host associations in *Megalopsallus* are distinctive within this related group of genera. *Megalopsallus* spp. are restricted to halophytes in the genus *Ephedra* of the primitive seed-plant group Ephedrales and among the angiosperms pri-
arily to several genera in the Chenopodiaceae and to the solanaceous genus *Lycium*. *Knightomirioides*, *Phoenicocoris*, *Pinomiris*, and some *Atractotomus* spp. feed on the Coniferales with the remaining *Atractotomus* spp. breeding on a variety of angiosperms; none are known to feed on the Chenopodiaceae, Solanaceae, or Ephedraceae (Stonedahl, 1990; Stonedahl and Schwartz, 1996).

A very few other Nearctic Phylini feed on halophytes. Among those that do is *Tannocoris sarcobati* Knight, 1970, which is found only on *Sarcobatus*, but which shows no obvious relationship with *Megalopsallus* on the basis of habitus or male genital morphology.

The Holarctic species *Atomoscelis onustus* (Fieber), 1861, belonging to an otherwise Palearctic group, apparently feeds exclusively on ruderal chenopods; most Nearctic records of this species are as *Atomoscelis modestus* (Van Duzee), 1914 [see Kerzhner and Schuh, 1998, for synonymy with *Atomoscelis onustus* (Fieber)]. The vesica of *Atomoscelis* appears always to be formed of a single strap basally, but is divided in two at the base of the secondary gonopore, a condition never seen in the species here assigned to *Megalopsallus*. Furthermore, *Atomoscelis* spp. are usually ovate and much less strongly sexually dimorphic than *Megalopsallus* spp.

A few other Palearctic Phylini merit examination as possible *Megalopsallus* relatives on the basis of morphology and/or host preferences. They are discussed here with the objective of determining whether *Megalopsallus* as a monophyletic group extends beyond the Nearctic.

*Camptotylidea* Wagner comprises 28 species (Konstantinov, 1999) occurring primarily in desert areas; many of them feed on chenopods. The vestiture of *Camptotylidea* is composed of only simple setae and the vesica is always extended apically well beyond the secondary gonopore, unlike the conditions found in all species here assigned to *Megalopsallus*.

*Nasocoris* Reuter from the Mediterranean and adjacent areas appears to feed exclusively on *Ephedra* (Schuh, 1995), which might suggest a relationship with *Megalopsallus*. However, the clypeus is distinctively flattened and extended and antennal segment 1 is moderately to greatly elongate and clothed with long to very long more-or-less erect setae. The vesica appears to be formed of a single strap, as in *Megalopsallus*, and the genital capsule is relatively small. The general appearance and coloration of *Nasocoris tesquorum* Kerzhner are similar to those of *Megalopsallus pallidus* and the dorsal vestiture is also similar to that of *Megalopsallus* spp. (Wagner, 1973).

*Psallomimus* Wagner, with one species in Egypt and the rest of its species further south in Africa (Schuh, 1995), has relatively small genitalia and the vesica is formed of a single strap as in *Megalopsallus*. However, the vestiture is always of simple setae, and the bugs are otherwise *Plagiognathus*-like in appearance. The only known host record is from *Solanum* sp. (Linnauvoori, 1993).

*Psallopsis* Reuter has 15 described species from the Mediterranean, Middle East, and Central Asia; all breed on members of the Chenopodiaceae (Schuh, 1995). Although host preferences in *Psallopsis* might suggest a relationship with *Megalopsallus*, the male genitalia indicate otherwise, the vesica being formed of two chitinous straps, rather than one as is the case in *Megalopsallus* (Wagner, 1975).

In conclusion, it appears that *Megalopsallus* as here diagnosed is restricted to the Nearctic, and within that region to halophytic plant groups. My conception of *Megalopsallus* is relatively broad, because when treated otherwise the result would be several more difficult to diagnose genera.

Although *Megalopsallus* shows its greatest species diversity in saline environments in interior western North America, it also occurs in the eastern United States—primarily along the coastline—from Texas to Connecticut, and most recently has been recorded from coastal halophytes in the Dominican Republic. Unfortunately, eastern North American is relatively poorly collected and few host records are available, in stark contrast to the West where nearly all species have well-documented hosts.

The following key to species is designed for use with male specimens. For most species the description of coloration will also pertain to females, although table 1 will have to be consulted for measurements. For a few
species it will be necessary to dissect the male genitalia to be confident of the identification. Sometimes host information will allow accurate identification of species such as *humeralis* and *nigrofemoratus*, which on the basis of external morphology and coloration may be virtually indistinguishable.

**Checklist of Species Names Proposed or Used Within *Megalopsallus* Knight**

*adustus* Knight, 1927 (*Megalopsallus*)  
*albipubescens* Knight (*Europiella*) [incertae sedis]  
*arizonae* Knight (*Megalopsallus*)  
*atriplicis* Knight, 1927 (*Megalopsallus*)  
*atriplicis* Knight, 1968 (*Psallus*) [preoccupied; see *punctatus*]  
*balli* Knight, 1968 (*Europiella*)  
*brendae*, new species  
*brevicornis* Knight, 1968 (*Europiella*)  
*brittoni* Knight, 1927 (*Megalopsallus*)  
*californicus*, new species  
*diversipes* Knight (*Europiella*)  
*ephedrae* Knight, 1968 (*Merinocapsus*)  
*euphyllus*, new species  
*fermoralis* Kelton, 1980 (*Megalopsallus*)  
*flammeus*, new species  
*franseriae* Knight, 1969 (*Europiella*)  
*froeschneri* Schuh, 1986 (*Merinocapsus*)  
*grayiae* Knight, 1968 (*Europiella*)  
*humeralis* Van Duzee, 1923 (*Sthenarus*)  
*knowltoni* Knight, 1970 (*Europiella*)  
*latifrons* Knight (*Europiella*)  
*lycii* Knight, 1968 (*Europiella*)  
*marmoratus* Knight, 1968 (*Megalopsallus*)  
*montanae* Knight, 1968 (*Europiella*)  
*monticola* Knight (*Europiella*) (see *Europiella*)  
*multipunctipes* Knight, 1970 (*Europiella*)  
*nicholi* Knight, 1968 (*Europiella*)  
*nigricaput*, new species  
*nigrofemoratus* Knight, 1968 (*Europiella*)  
*nuperus* Van Duzee, 1923 (*Oncotylus*)  
*pallidus* Knight, 1968 (*Nevadocoris*)  
*pallipes* Knight, 1968 (*Ankylotylus*)  
*parapunctipes*, new species  
*punctatus* Van Duzee, 1918 (*Plagiognathus*)  
*punctipes* Knight, 1968 (*Europiella*)  
*rubricornis* Knight, 1968 (*Europiella*)  
*rubropunctipes* Knight, 1927 (*Megalopsallus*)  
*rufiventris* Knight, 1968 (*Europiella*)  
*sarcothra* Knight, 1969 (*Europiella*)  
*schwartzii*, new species  
*sparus* Van Duzee, 1918 (*Europiella*)  
*stitti* Knight, 1968 (*Europiella*)  
*suadae* Knight, 1925 (*Atriplex*)  
*teretis*, new species  
*viridiventris* Knight, 1968 (*Europiella*)

**Key to Males of *Megalopsallus* Knight**

1. Dorsum, including head, nearly unicolorous pale, usually greenish, sometimes almost white or yellowish or pinkish; dorsum sometimes with small reddish spots or other markings on head, pronotum, and scutellum, or light brown spots at bases of setae ................................. 2
2. Membrane marmorate; entire dorsum, venter, and appendages pale green (fig. 7); legs with some small brown spots; male genitalia as in figure 13 (San Joaquin Valley, California; host unknown) ..... *californicus*
3. Antennal segment 1 almost entirely dark; dorsum pale green (see fig. 7, *brendae*) ..... 4
4. Femora pale green with some distinct black spots (fig. 7); vertex and calli sometimes weakly infuscate; frons often with a dark transverse line at level of base of clypeus; genitalia as in figure 13 (Mojave Desert; ex *Lycium*, Chenopodiaceae sp.) ..... *brendae*
5. Body and appendages entirely pale (see fig. 10, *pallidus*) ................................. 6
6. Eyes white (fig. 10); larger species, total length 4.01–4.35, length apex clypeus–cuneal fracture 2.61–2.83, width across pronotum 1.09–1.19; genitalia as in figure 15 (Nevada; ex *Atriplex, Grayia*) ................................. *punctipes*
- Eyes red (fig. 12); smaller species, total length 3.46–3.70, length apex clypeus–cuneal fracture 2.26–2.37, width across pronotum 0.96–1.03; genitalia as in figure 16 (Great Basin; ex Sarcobatus) schwartzi
7. Eyes red or reddish, distinctly protuberant, especially in males (fig. 12, rubropictipes); femora often with some reddish spots or markings .......................... 8
- Eyes pale (fig. 12, sarcobati), grayish, or blackish (fig. 12, sparsus), never bright red or strongly protruding; femora spotted, but never with red .......................... 11
8. Dorsum largely pale, cream colored, pronotum (except humeral angles) and scutellum contrastingly reddish or brownish (fig. 10); genitalia as in figure 15 (southwestern Nevada and Utah; ex Ephedra) ........... pallipes
- Dorsum unicolorous or nearly so, at most with some small red spots on head and pronotum .......................... 9
9. Relatively small, slender species (fig. 7, total length 3.25–3.77, length apex clypeus–cuneal fracture 2.20–2.48, head relatively narrow, width across eyes 0.77–0.84; genitalia as in figure 13 (Interior western North America, western Great Plains south to southern Texas; ex Atriplex, Sarcobatus) ................................ atriplicis
- Larger, more robust species, total length at least 3.10, length apex clypeus–cuneal fracture at least 2.27, width across eyes 0.85–0.94 .......................... 10
10. Femora usually distinctly reddish, in contrast to greenish coloration of dorsum (fig. 12); males elongate, females sometimes weakly to strongly brachypterous; genitalia as in figure 16 (Saskatchewan south to New Mexico and west to Oregon; ex Atriplex, Sarcobatus, Suaeda) ......... rubropictipes
- Femora, if reddish, usually not noticeably contrasting with remaining coloration (fig. 10); sexual dimorphism weak to nearly absent (fig. 10); genitalia as in figure 15 (Texas Gulf coast north to Colorado and Utah, coastal Sinaloa, Mexico, Dominican Republic; ex Atriplex, Batis, Sarcobatus, Suaeda) ...... nuperus
11. Eyes black or blackish (fig. 12); thoracic pleuron and venter and abdominal venter obviously infuscate; at least head often with dark markings, sometimes also anterior pronotal lobe and scutellum (fig. 12); genitalia as in figure 16 (Saskatchewan south to Texas and west to southern California; ex Atriplex) .............. sparsus
- Eyes pale, usually white or pale gray (fig. 12, sarcobati); head never with dark markings; at most thoracic sternum darkened, thoracic pleuron and abdomen pale; setae on dorsum sometimes with brown bases .......................... 12
12. Dorsum pale, nearly white, more or less uniformly covered with tiny brown spots at bases of setae on a lighter background (fig. 11); large broad-bodied, total length 3.78–4.15, length apex clypeus–cuneal fracture 2.47–2.70, width across pronotum 1.16–1.27; genitalia as in figure 16 (extreme western Texas, New Mexico, Arizona, southern Nevada; ex Atriplex) ........... punctatus
- Dorsum, although uniformly pale, never with brown spots at bases of setae; size variable .......................... 13
13. Elongate slender species, total length 3.28–4.12, length apex clypeus–cuneal fracture 1.93–3.16, width of head 0.65–0.74, width across pronotum 0.91–1.00; coloration pale; ex Atriplex .......................... 14
- Shorter, more robust species, total length 3.04–3.26, length apex clypeus–cuneal fracture 2.05–2.22, width of head 0.84–0.87, width across pronotum 1.01–1.08; coloration always at least weakly greenish (fig. 12); genitalia as in figure 16 (Great Basin; ex Sarcobatus) ........... sarcobati
14. Thoracic sternum infuscate; genitalia as in figure 15; total length 3.28–3.72, length apex clypeus–cuneal fracture 2.12–2.42, width of head 0.65–0.73, width across pronotum 0.91–1.00 (fig. 10) (SW Great Basin; ex Atriplex confertifolia) ............... parapunctipes
- Thoracic sternum never dark; genitalia as in figure 16; total length 2.91–4.12, length apex clypeus–cuneal fracture 1.93–3.16, width of head 0.73–0.74, width across pronotum 0.92–0.99 (fig. 11) (Great Basin and southern Rocky Mountains; ex Atriplex) ............... punctipes
15. Membrane marmorate; dorsum usually tan with a greater or lesser amount of reddish to brown spotting; all femora strongly reddish brown (fig. 9); genitalia as in figure 15 (Arizona and adjacent areas; ex Allenrolfea, Sarcocinia) ............ marmoratus
- Membrane not marmorate; dorsum sometimes variably reddish brown with brown spots at bases of setae on a lighter background and femora reddish (fig. 7, 8) .......................... 17
16. General coloration, including legs and veins of membrane, intensely and completely red or reddish (fig. 7, 8) .......................... 17
- General coloration variable, but never completely reddish .......................... 18
17. Pronotum and scutellum sometimes darker
than remainder of dorsum (fig. 7); genitalia as in figure 14 (central Nevada; ex Sarcobatus baileyi) .................................. flammus

- Pronotum and scutellum of same shade as remainder of dorsum (fig. 8); genitalia as in figure 14 (southern Utah to northern Baja California; ex Ephedra) ........... ephedrae

18. Coloration of dorsum entirely dark, ranging from brown to black (figs. 9, 10, 12, 21, 23) ........................................ 19
- Coloration of dorsum never completely dark, ranging from completely pale to partly dark ........................................ 20

19. Relatively large species, total length 4.51–5.20, length apex clypeus–cuneal fracture 2.79–3.31, width across pronotum 1.15–1.32; antennal segment 2 slender, of uniform diameter, never spindle-shaped (fig. 9); genitalia as in figure 14 (northern Great Basin; ex Sarcobatus vermiculatus) ................. knowltoni

- Smaller species, total length in males 2.57–3.88, length apex clypeus–cuneal fracture 1.74–2.46, width across pronotum 0.94–1.16; shape of antennal segment 2 straight or spindle-shaped .................................. 20

20. Antennal segment 2 in males enlarged, cylindrical, but diameter at most slightly greater than diameter of segment 1 (figs. 12, 22); antennal segment 2 in females moderately to strongly spindle-shaped (figs. 12, 23); antennae and legs conspicuously reddish in most specimens; genitalia as in figure 16 (southern Nevada to Zacatecas, Mexico; ex Lycium) ....................... teretis

- Antennal segment 2 cylindrical in both sexes, never spindle-shaped, diameter slightly less than that of segment 1; vesica not as in figure 16; coloration of legs and antennae sometimes reddish .................................. 21

21. Genitalia as in figure 15; antennal segments 1 and 2 varying from pale to reddish (fig. 10) (Canada to central Mexico; ex Atriplex, Grayia, ) ............... nigrofemoratus

- Genitalia as in figure 14; antennal segments 1 and 2 varying from pale to dark (fig. 9) (southern Nevada and California, Arizona, Baja California; ex Lycium) ........... humeralis

22. Head and eyes castaneous, strongly contrasting with pale green to nearly white remainder of dorsum (figs. 6, 9); antennal segment 1, thoracic venter (including coxae), and much of femora also castaneous; genitalia as in figure 15 (Arizona, Mojave Desert; ex Lycium) .................. nigricaput

- If head and eyes castaneous, then remainder of dorsum never entirely pale ....... 23

23. Head, pronotum, mesoscutum, sometimes part or all of scutellum, and extreme base of hemelyta ranging from pale red to castaneous, in contrast to white or pale green remainder of dorsum .................. 24

- Coloration variable, but never exactly as above, and if hemelytra mostly pale then abdomen mostly dark, or at most partially pale with at least some reddish or infuscate areas .................................. 25

24. Coloration as in figure 11; abdomen pale green, strongly contrasting with castaneous thoracic pleuron and venter; genitalia as in figure 16 (Great Basin; ex Sarcobatus) ........................................... rubricornis

- Coloration as in figure 8; abdomen pale green, thoracic pleuron and venter pale orange; genitalia as in figure 13 (west Texas; ex Ephedra) ............... ephedrellus

25. Head, pronotum, and usually scutellum entirely castaneous to nearly black, or if not entirely so, then only posterior humeral angles of pronotum and sometimes apex of scutellum pale ... 26

- Head, pronotum, and scutellum not entirely castaneous, often largely pale ....... 30

26. Dark coloration of pronotum contrasting with that of hemelytra, the latter ranging from largely pale to distinctly orange or reddish ........................................ 27

- Dark coloration of pronotum usually not strongly contrasting with coloration of hemelytra; if hemelytra pale, then cuneus never reddish ............... 29

27. Head, pronotum, entire venter, and all femora deep reddish to castaneous, contrasting with pale (but not white) coloration of hemelytra (figs. 5, 9); cuneus always weakly reddish; genitalia as in figure 15 (southern Arizona, Mexico; ex Lycium) .......... nicholi

- Head, pronotum, and scutellum nearly black; hemelytra, including cuneus, deep orange to red orange ................................. 28

28. Head, pronotum, and scutellum dull; femora unicolorous dark (fig. 8); tibiae infuscate; genitalia as in figure 14 (southern Nevada and Utah south to central Baja California; ex Ephedra) .......... ephedrae

- Head, pronotum, and scutellum polished and moderately to strongly shining (fig. 8); femora pale at least on distal one-half; tibiae pale (southern Nevada, Utah, and California; ex Ephedra) .......... froeschneri

29. Genitalia as in figure 15; antennal segments 1 and 2 usually pale, although sometimes reddish (fig. 10) (Canada to central Mexico; ex Atriplex, Grayia, and Sarcobatus) ........................................... nigrofemoratus
- Genitalia as in figure 14; antennal segments 1 and 2 usually dark, less commonly reddish or pale (fig. 9) (southern Nevada and California, Arizona, Baja California; ex Lyctum) ................... humeralis

30. Hemelytra most frequently entirely pale, usually weakly greenish or grayish; head, anterior lobe of pronotum, mesoscutum, and more rarely hemelytra broadly dark (fig. 12); genitalia as in figure 16 (Texas to southern California; ex Atriplex) ........

- Coloration of dorsum reddish, often spotted or mottled, never greenish or grayish

31. Larger species, total length 3.57–3.82, length apex clypeus–cuneal fracture 2.58–2.71, width across pronotum 1.18–1.29 (fig. 7); antennal segment 2 relatively long, length 1.04–1.16; genitalia as in figure 13 (coastal Connecticut south to Florida and east to Texas); host unknown ............ brittoni

- Smaller species, total length 3.09–3.24, length apex clypeus–cuneal fracture 2.16–2.29, width across pronotum 0.99–1.07 (fig. 7); antennal segment 2 relatively short, length 0.83–0.92; genitalia as in figure 13 (northern Rockies; ex Salicornia) ........... femoralis

Megalopsallus atriplicis Knight

Figures 7, 13

Megalopsallus atriplicis Knight, 1927: 224 (n. sp.).

Diagnosis: Recognized by relatively small size, protuberant red eyes, and distinctly red spots on the head, pronotum, and femora (fig. 7). Possibly most easily confused with schwartzii and nuperus. Former species also occurring on Sarcobatus at same localities, but lacking red spots and protuberant eyes; latter species more robust, without red spots and distinctive sexual dimorphism of atriplicis. Megalopsallus femoralis, marmoratus, and pictipes frequently with red spots, but without distinctly red eyes and strong sexual dimorphism.

Description: Male: Small, elongate, total length 3.25–3.77, length apex clypeus–cuneal fracture 2.20–2.48, width across pronotum 0.95–1.04. Coloration: General coloration cream to faded orange; vertex, anterior margin of pronotum, and all femora with some reddish spots (fig. 7); eyes red; thoracic pleuron and venter, all coxae, and much of abdomen in females heavily infuscate; tibiae pale with dark spots at bases of pale spines. Surface and vestiture: Dorsum smooth, weakly shining, clothed with recumbent, pale, simple setae intermixed with silvery, weakly flattened setae. STRUCTURE: Hemelytra moderately elongate, nearly parallel sided; eyes in males large, protuberant (fig. 7); labium reaching posterior margin of middle trochanters; claws relatively long and slender, smoothly curving; pulvilli minute. Male genitalia: Vesica weakly sigmoid, slender (fig. 13), attenuated apically; gonopore small, subapical, not subtended by a gonopore sclerite (fig. 13).

Female: Total length 2.97–3.19, length apex clypeus–cuneal fracture 2.14–2.33, width across pronotum 0.99–1.08; relatively stout, ovoid (fig. 7).

Hosts: Atriplex matamorensis, Atriplex texana, Atriplex sp. Sarcobatus vermiculatus, S. baileyi (Chenopodiaceae).

Distribution: Interior of western North America east to the western plains south to southern Texas.

Discussion: In the present paper atriplicis is conceived as widespread and not strongly host specific. This approach might be revised under more critical analysis. My treatment is influenced by the fact that genitalia cannot be used to readily recognize this species, or to distinguish it from nuperus and rubropicites, in particular. Also, nearly all material from the eastern part of the range, including the type locality, was from older collections, which made comparisons of coloration difficult. Finally, a vast section of the western plains and Rocky Mountains was virtually unrepresented in the available sample of material.

Fig. 1. *Megalopsallus brendae*, male, scanning micrographs. A. Lateral view of head and thorax. B. Mesothoracic spiracle and metathoracic scent gland evaporatory area. C. Detail of setae comprising dorsal vestiture. D. Lateral view of pretarsus.

R. Rolfs, 11♂, 10♀ (USNM). Yakima, June 30, 1932, A. R. Rolfs, 10♂, 8♀ (USNM).

**Wyoming:** Sheridan Co.: Arvada, July 31, 1927, H. H. Knight, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♂, 2♀ (USNM).

*Megalopsallus brendae,* new species

Figures 1, 7, 13


**DIAGNOSIS:** Recognized by generally pale greenish coloration of dorsum contrasting with dark antennal segment 1; possibly most easily confused with *sarcobati* on basis of pale green coloration; differing from that species in having antennal segment 1 dark and venter darkened in males. Vesica in male somewhat heavier and more nearly forming a coil than in most other *Megalopsallus* species (fig. 13).

**DESCRIPTION:** Male: Relatively small, total length 2.74–3.16, length apex clypeus–cuneal fracture 2.74–3.16, width across pronotum 0.90–1.01. **COLORATION:** Generally pale with a greenish tinge (fig. 7); eyes, transverse line on frons at level of base of clypeus, maxillary plate, antennal segment 1 (except base and apex), thoracic pleuron and venter, and abdomen including genital capsule brownish black; femora with dark spots, tibial spines black with dark bases. **SURFACE AND VESTITURE:** Dorsum weakly polished and moderately shining, covered with dark, recumbent, simple setae intermixed with silvery, weakly flattened setae (fig. 1C); tibial spines black with black bases. **STRUCTURE:** Moderately elongate and par-
allel-sided; head strongly declivent (fig. 1A); labium relatively short, reaching about midway between fore and middle trochanters; claws broad basally, curving near apex, pulvilli small (fig. 1D). MALE GENITALIA: Vesica rather strongly coiled and stout (fig. 13), not attenuated apically; gonopore well developed, weakly subapical; gonopore sclerite long, distinctly sclerotized (fig. 13).

Female: Total length 2.53–2.90, length apex clypeus–cuneal fracture 2/53–2.90, width across pronotum 0.91–1.03; more strongly ovoid than male (fig. 7).

ETYMOLOGY: Named for my wife Brenda Massie, who accompanied me in the field while collecting specimens of this and many other species of Megalopsallus.

HOSTS: Chenopodium (?) sp. (Chenopodiaceae); Lycium cooperi (Solanaceae).

DISTRIBUTION: Mojave Desert of Arizona, southern California, and southern Nevada.

DISCUSSION: Of the species I am placing in Megalopsallus, brendae probably fits most uncomfortably. The facies are not what might be called typical and neither are the genitalia. Nonetheless, the general structure and host preferences agree more closely with other Megalopsallus species than they do with species in any group of North American Phylini.


Megalopsallus brittoni Knight
Figures 7, 13

Megalopsallus brittoni Knight, 1927: 227 (n. sp.)
Megalopsallus adustus Knight, 1927: 227 (n. sp.).

NEW SYNONYMY.

DIAGNOSIS: Most similar to femoralis in reddish brown coloration and spots at bases of setae on dorsum in most specimens, but femoralis more strongly sexually dimorphic. Similar in appearance to nuperus in near absence of sexual dimorphism and protuberant eyes, but that species lacking brown spots at the bases of setae on dorsum. Further distinguished from nuperus by differences in structure of male genitalia (compare figs. 13 and 15).

REDESCRIPTION: Male: Medium sized, total length 3.57–3.82, length apex clypeus–cuneal fracture 2.86–3.10, width across pronotum 1.33–1.42. COLORATION: General coloration, including legs, reddish brown, with some more strongly reddish spots or markings, particularly on head and anterior half of pronotum; eyes distinctly reddish; bases of setae on dorsum often with darkened spots at bases; tibial spines pale with brown bases not strongly contrasting with remainder of tibia. SURFACE AND VESTITURE: Entire body surface dull, matte; dorsum with dark simple setae intermixed with woolly, silvery setae. STRUCTURE: Relatively broad, hemelytra not conspicuously elongate; eyes protuberant; labium long, reaching posterior margin of hind trochanters; tarsal claws elongate, slender, curving, pulvilli very small. MALE GENITALIA: Vesica S-shaped; gonopore subapical; gonopore sclerite not developed (fig. 13).

Female: Total length 3.85–4.16, length apex clypeus–cuneal fracture 2.86–3.10, width across pronotum 1.33–1.42; sexual dimorphism weak, females slightly more robust than males (fig. 7).

HOST: Unknown.

DISTRIBUTION: Known from Connecticut and Texas, primarily from coastal localities.

DISCUSSION: Knight (1927) described brittoni and adustus on the same page, separating them primarily on the length of the second antennal segment. Although this measurement was frequently used by Knight to discriminate species, I have found it to be less reliable than was believed by Knight, owing to variability within species. I have seen only two specimens of brittoni, and have compared them with large numbers of specimens from Texas, including the holotype of adustus from Anahuac, that agree closely with Knight’s concept of adustus. I
am treating *adustus* as a junior synonym of *brittoni* because both nominal taxa have brown spots at the bases of many of the setae on the dorsum, an attribute found elsewhere in *Megalopsallus* only in *punctatus*, the last species otherwise showing little similarity to *brittoni*.


**Megalopsallus californicus**, new species

*Figures 7, 13*

**Holotype:** Male, Schafter, Calif., IX-24-1940, G. L. Smith Coll. Deposited in the California Academy of Sciences, San Francisco.

**Diagnosis:** Recognized by pale green coloration and marmorate membrane, the latter characteristic occurring elsewhere in *Megalopsallus* only in the heavily reddish brown *M. marmoratus* Knight.

**Description:** Male: Relatively small, total length 2.78–3.10, length apex clypeus–cuneal fracture 1.88–2.12, width across pronotum 0.94–1.03. COLORATION: Pale, weakly greenish; eyes red; membrane of hemelytra generally pale, marmorate posterior to cells (fig. 7); femora with some brown spots; tibial spines pale, with at most medium brown bases. SURFACE AND VESTITURE: Dorsum with brown, recumbent, simple setae intermixed with woolly, silvery setae. STRUCTURE: Elongate ovoid; labium long, surpassing posterior margin of hind trochanters; claws elongate, curving, pulvilli small. MALE GENITALIA: Vesica S-shaped, attenuated apically; gonopore relatively small, subapical; gonopore sclerite not developed (fig. 13).

**Female:** Total length 2.72–2.90, length apex clypeus–cuneal fracture 1.98–2.26, width across pronotum 1.01–1.13; more broadly ovoid than male (fig. 7).

**Etymology:** Named for its occurrence in California.

**Host:** Unknown.

**Distribution:** Southern San Joaquin Valley, California.

**Paratypes:** USA. — California: Kern Co.: Schafter, September 24, 1940, G. L. Smith, 23♂, 18♀ (UCB, AMNH). Schafter, September 15, 1942, G. L. Smith, 2♂, 2♀ (USNM).

**Megalopsallus ephedrae** (Knight), new combination

*Figures 8, 14*

**Diagnosis:** Recognized by dull, orange or nearly black head, pronotum, and scutellum and pale to red hemelytra with orange cuneus and smoky membrane; femora always unicolorous orange or dark. Coloration of dorsum often similar to *froeschneri*, but femora in that species always paler distally than proximally, whereas in *ephedrae* femora unicolorous over entire length. Head, pronotum, and scutellum in *froeschneri* usually more strongly polished and shining than in *ephedrae*.

**Redescription:** Male: Medium sized, total length 3.41–4.32, length apex clypeus–cuneal fracture 2.24–2.81, width across pronotum 0.95–1.14. COLORATION: Head, pronotum, and scutellum dull, usually castaneous to nearly black, sometimes orange; hemelytra ranging from pale to intensely red orange or red, cuneus always orange to red, membrane smoky, veins orange (fig. 8); eyes dark, often mostly black; underside of body usually dark, castaneous; antennae dark; legs of similar coloration to underside of body, tibiae sometimes lighter and tibial spines with visible small dark bases; appendages and underside of body orange in specimens with completely orange dorsum. SURFACE AND VESTITURE: Head, pronotum, and scutellum smooth, dull, clothed with recum-
bent, dark, simple setae intermixed with woolly, silvery setae. STRUCTURE: Elongate, parallel-sided; specimens in some populations relatively longer than those in others; head strongly declivent (fig. 3); labium reaching to about apex of middle coxae; claws moderately elongate, smoothly curving; pulvilli small. MALE GENITALIA: Vesica elongate, twisted, with bifid apex, secondary gonopore subapical with a weakly sclerotized gonopore sclerite (fig. 14).

Female: Total length 2.98–3.22, length apex clypeus–cuneal fracture 2.16–2.34, width across pronotum 1.04–1.12; similar in coloration to males, body not so elongate and more strongly ovoid (fig. 9).

HOSTS: Ephedra aspera, E. nevadensis, E. viridis (Ephedraceae).

DISTRIBUTION: Northern Baja California, and Mojave Desert of southern California, southern Nevada, and southern Utah.

DISCUSSION: This is the most variable of the Ephedra-feeding species. The bifid apex of the vesica suggests a close relationship with the Ephedra-feeding species froeschneri and pallipes.


Megalopsallus ephedrellus, new species

Figures 8, 13

HOLOTYPE: Male, Texas: Crockett Co.: 16.7 mi west Ozona, May 9, 1997, Gillogly & Schaffner. Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by pale orange coloration of head, thorax, and hemelytra anterior to apex of scutellum, and dirty greenish coloration posterior to that point; abdomen bright pale green. Size and form of sexual dimorphism similar to nuperus, but that
species never with greenish on the hemelytra.
Breeds on *Ephedra*.

**DESCRIPTION:** *Male:* Moderately small, total length 2.97–3.25, length apex clypeus–cuneal fracture 2.05–2.24, width across pronotum 0.98–1.07. **COLORATION:** Head, thorax, appendages, and hemelytra anterior to apex of scutellum pale orange, remainder of hemelytra dirty pale green (fig. 8); abdomen bright pale green; eyes red. **SURFACE AND VESTITURE:** Dorsum smooth, dull, or very weakly shining, clothed with dark, recumbent, simple setae intermixed with silvery, weakly flattened, somewhat woolly setae. **STRUCTURE:** Relatively stout-bodied, corial margins nearly straight (fig. 8); labium short, just surpassing posterior margin of fore trochanters; claws elongate, smoothly curving, pulvilli minute. **MALE GENITALIA:** Vesica relatively large, forming a weak coil, apex relatively strongly attenuated and extending well past secondary gonopore, gonopore subtended by a well-developed gonopore sclerite (fig. 13).

**Female:** Total length 2.64–2.78, length apex clypeus–cuneal fracture 1.94–2.04, width across pronotum 0.96–1.01; more strongly ovoid than male, hemelytra nearly conforming to outline of abdomen (fig. 8).

**ETYMOLOGY:** Named for the host genus *Ephedra*.

**HOST:** *Ephedra* sp. (Ephedraceae).

**DISTRIBUTION:** Known only from the type locality near Ozona in western Texas.

**DISCUSSION:** This is one of four species currently placed in *Megalopsallus* that is recorded as feeding on *Ephedra*. The bifid apex of the vesica suggests that the other three species are more closely related to one another than any one of them is to *ephedrellus*.

**PARATYPES:** Same data as holotype: 6 males, 52 females (AMNH; TAMU; USNM).

*Megalopsallus femoralis* Kelton

Figures 7, 13

*Megalopsallus femoralis* Kelton, 1980: 285 (n. sp.).

**DIAGNOSIS:** Recognized by somber coloration and relatively small size. Similar in size and general appearance to *marmoratus*, but lacking marmorate membrane. Similar in coloration to *brittoni* but smaller.

**REDESCRIPTION:** *Male:* Moderately small, total length 3.09–3.24, length apex clypeus–cuneal fracture 2.16–2.29, width across pronotum 0.99–1.07. **COLORATION:** General coloration somber, head, pronotum, scutellum, eyes, legs, and most of undersurface of body brown or reddish brown, remainder of dorsum and most of antennae tan, head and pronotum sometimes with some red spots (fig. 7). **SURFACE AND VESTITURE:** Body surface dull, never shining; dorsum with brown, recumbent, simple setae intermixed with subpressed, shining, weakly flattened setae. **STRUCTURE:** Moderately elongate; labium reaching posterior margin of hind trochanters; claws noticeably elongate, curving, pulvilli small. **MALE GENITALIA:** Vesica S-shaped with a short apical attenuation; gonopore subapical; gonopore sclerite not developed (fig. 13).

**Female:** Total length 3.05–3.34, length apex clypeus–cuneal fracture 2.24–2.36, width across pronotum 1.01–1.09; more broadly ovoid, frons conspicuously more protuberant and clypeus more obviously visible from above than in male (fig. 7).

**HOST:** *Salicornia rubra* (Chenopodiaceae).

**DISTRIBUTION:** Western Great Plains from Alberta south to Colorado.

**DISCUSSION:** This species is similar to *brittoni*, especially in coloration and the weak sexual dimorphism. However, available specimens of *femoralis* are all smaller than those of *brittoni*, with no size overlap between the two taxa. The male genitalia, although similar, appear to show consistent differences. Also, as here construed, the distributions of the two taxa are nonoverlapping.


Fig. 2. Habitus of *Megalopsallus flammeus*, male (Nevada, Nye Co., 35 mi N of Tonapah, Coyote Hole Spring/Sevier Reservoir).


**Megalopsallus flammeus**, new species

Figures 2, 7, 14


**Diagnosis**: Recognized unequivocally by bright red coloration of the body and appendages; sexual dimorphism strong (fig. 8).

**Description**: *Male*: Moderately small, total length 3.08–3.34, length apex clypeus–cuneal fracture 2.02–2.08, width across pronotum 0.96–1.01. COLORATION: General coloration bright red (fig. 7), including legs (except tarsi); pronotum, scutellum, and underside often tending toward black; eyes blackish; membrane smoky with red veins; tibial spines black but without contrasting dark bases. SURFACE AND VESTITURE: Body surface smooth, weakly shining; dorsum with recumbent, brown, simple setae in-
termixed with silvery woolly setae. STRUCTURE: Conspicuously elongate, nearly parallel-sided (figs. 2, 7); labium reaching to hind trochanters; claws relatively short and stout, curving only near apex, pulvilli large, extending to apex of claw, apparently adnate to claw over entire length. MALE GENITALIA: Vesica strongly bent at about midpoint; gonopore large, nearly apical; gonopore sclerite long, well sclerotized (fig. 14).

Female: Total length 2.33±2.59, length apex clypeus±cuneal fracture 1.73±1.90, width across pronotum 0.90±0.98; short, broad, ovoid, in distinct contrast to male (fig. 7).

ETYMOLOGY: Named for its distinctive red-orange coloration; from the Latin flammeus, flame colored.

HOSTS: Sarcobatus baileyi, S. vermiculatus (Chenopodiaceae).

DISTRIBUTION: Central Nevada.

DISCUSSION: I have collected large numbers of specimens of this species on hosts identified as Sarcobatus vermiculatus var. baileyi. Although specimens collected by O'Brien are labeled as occurring on S. vermiculatus, I have never encountered specimens on ``true'' vermiculatus, and conversely, most records of vermiculatus-feeding species are not known from var. baileyi. Therefore, host data for the bugs suggest that baileyi represents a distinct plant species.

This species was collected at more than one locality on specimens of Sarcobatus baileyi also inhabited by a mite belonging to the genus Balaustium (Erythraeidae), which was very similar in appearance and coloration to the females of flammeus. Adults of Balaustium spp. are free-living predators of small arthropods, whereas the larvae are ectoparasites of the same. The relationship, if any, of the mites and the bugs in this particular case is not known. On the occasion of first collecting this brightly colored bug species my field companions and I dubbed it "the mite mimic" in recognition of the rather strong similarity of appearance of the two taxa.


Megalopsallus froeschneri (Schuh), new combination

Figures 8, 14

Merinocapsus froeschneri Schuh, 1986: 220 (n. sp.).

DIAGNOSIS: Recognized by nearly black, weakly to strongly shining head, pronotum, and scutellum, these always contrasting with hemelytra, the latter being either pale with red-orange cuneus or entirely red orange. Coloration of dorsum similar to ephedrae, but femora in that species always entirely dark, whereas in froeschneri femora orange at least on distal one-half. The head, pronotum, and scutellum in froeschneri usually more strongly polished and shining than in ephedrae.

REDESCRIPTION: Male: Medium sized, total length 3.09–3.37, length apex clypeus–cuneal fracture 2.16–2.31, width across pronotum 1.02–1.08. COLORATION: Head, pronotum, and scutellum castaneous to nearly black; hemelytra ranging from orange to intensely red-orange, cuneus always orange, membrane, including most of veins, smoky (fig. 8); eyes black; underside of body castaneous; antennae dark; coxae dark, femora dark proximally, orange distally; tibiae pale, tibial spines dark without dark bases. SURFACE AND VESTITURE: Head, pronotum, and scutellum smooth, polished and shining, clothed with recumbent, dark, simple setae intermixed with woolly, silvery setae. STRUCTURE: Relatively broad-bodied, parallel-sided (fig. 8); labium reaching to near
apex of middle coxae; claws elongate, smoothly curving, pulvilli small. MALE

GENITALIA: Vesica of moderate length, S-shaped, apex bifid with short projections, secondary gonopore removed from apex by distance equal to length of gonopore, gonopore sclerite very small (fig. 14).

**Female:** Total length 2.98–3.20, length apex clypeus–cuneal fracture 2.10–2.35, width across pronotum 1.05–1.09; very similar in appearance and coloration to males, nearly parallel-sided (fig. 9).


**DISTRIBUTION:** Mojave Desert in southern California, Nevada, and Utah; New Mexico.

**DISCUSSION:** Based on the bifid apex of the vesica, *froschneri* would appear to be most closely related to *epidrae* and *pallipes*, and on coloration most closely related to *epidrae*.

Megalopsallus humeralis (Van Duzee)  
Figures 3, 9, 14

Sthenarus humeralis Van Duzee, 1923: 162 (n. sp.).
Megalopsallus humeralis: Schuh et al., 1995: 389  
(n. comb.).
Megalopsallus arizonae Knight, 1968: 45 (n. sp.).  
NEW SYNONYMY.
Europiella balli Knight, 1968: 44 (n. sp.).  
NEW SYNONYMY.
Megalopsallus balli: Schuh et al., 1995: 389 (n. comb.).
Europiella brevicornis Knight, 1968: 45 (n. sp.).  
NEW SYNONYMY.
Megalopsallus brevicornis: Schuh et al., 1995: 389 (n. comb.).
Europiella lycii Knight, 1968: 40 (n. sp.).  
NEW SYNONYMY.
Megalopsallus lycii: Schuh et al., 1995: 389 (n. comb.).
Europiella rufuliventris Knight, 1968: 42 (n. sp.).  
NEW SYNONYMY.
Megalopsallus rufuliventris: Schuh et al., 1995: 389  
(n. comb.).
Europiella viridiventris Knight, 1968: 42 (n. sp.).  
NEW SYNONYMY.
Megalopsallus viridiventris: Schuh et al., 1995: 389  
(n. comb.).

DIAGNOSIS: Recognized by frequently dark  
coloration of most of dorsum and femora, or at  
least dark coloration of head, pronotum,  
scutellum, and femora, with pale hemelytra.  
Most easily confused with nigrofemoratus on  
basis of size, coloration, and type of sexual  
dimorphism; separated most easily by differences  
in structure of male genitalia, vesica  
being more elongate and slender in nigrofemoratus  
than in humeralis, and fact that nigrofemoratus  
feeds on Atriplex and Grayia  
(Chenopodiaceae) rather than Lycium (Sola-  
naceae), the latter appearing as exclusive  
host of humeralis. Pale specimens separated  
from Lycium-feeding nicholi by cuneus being  
unicolorous with corium, rather than of at  
least moderately contrasting coloration as in  
nicholi.

sp. (Ephedraceae), 1♀ (AMNH). 2.7 mi W  
of Rt. 95 on Rt. 263, T37S R17E, 6000 ft, June  
18, 1983, R. T. Schuh and M. D.  
Schwartz, Ephedra torreyana (Ephedraceae).  
Paratypes: 2♂ (AMNH). Head of Lake  
Canyon near Nokai Dome Road, 4200 ft, May  
NW of Toquerville on Rt 17, 3800 ft, May  
25, 1981, M. D. Schwartz, Ephedra viridis  
(Ephedraceae), 1♀ (AMNH).
Re-description: Male: Small to medium sized, total length 2.57–3.63, length apex clypeus–cuneal fracture 1.74–2.31, width across pronotum 0.94–1.11. COLORATION: Dorsum varying from largely deep brown to nearly entirely pale brown, often with head, pronotum, and scutellum dark, hemelytra somewhat lighter to much lighter (fig. 9); eyes blackish; underside mostly reddish, sometimes almost entirely pale, or brownish; femora dark or darkened, tibiae pale, tibial spines dark with dark bases. SURFACE AND VESTITURE: Dorsum smooth, very weakly shining, clothed with recumbent, dark, simple setae intermixed with woolly, silvery setae (figs. 3, 9). STRUCTURE: Weakly to strongly elongate, parallel-sided; specimens in some populations longer than those in others (fig. 9); head strongly declivous (fig. 3); labium reaching onto, but not beyond, hind trochanters; claws relatively short and straight, curving sharply near apex; pulvilli large, adnate to nearly entire ventral surface of claw. MALE GENITALIA: Vesica pulvilli large, adnate to nearly entire ventral ter in color than would be expected of fresh material.

Megalopsallus humeralis shows substantial size variation. The structure of the male genitalia is relatively constant across the range of other forms of variation. Table 1 presents the measurements for this species in two nonoverlapping groupings of “small” and “large” specimens, reflecting the fact that in most populations the specimens are either relatively large or relatively small.

A massive amount of material with care-fully documented hosts indicates that humeralis invariably feeds on Lycium spp. The records of specimens from other plant groups offer little evidence for them as alternative hosts. I have collected extensively on all of the plant taxa listed above under “hosts,” and never recorded Megalopsallus breeding on any other than Lycium.


Megalopsallus knowltoni (Knight)
Figures 4, 9, 14
Europiella knowltoni Knight, 1970: 228 (n. sp.). Megalopsallus knowltoni: Schuh et al., 1995: 389 (n. comb.).

Diagnosis: Recognized by large size and totally black coloration (fig. 9). Similar in size, general appearance, coloration, and strong sexual dimorphism to Dakota hesperia Uhler, but readily separated by male genital structure and hosts, hesperia breeding on Potentilla (Rosaceae) rather than Sarcobatus (Chenopodiaceae). Within Megalopsallus, most similar in coloration to dark specimens of humeralis, nigrofemoratus, and teretis, but easily distinguished by much larger size.

Redescription: Male: Large, total length 4.51–5.20, length apex clypeus–cuneal fracture 2.79–3.31, width across pronotum 1.15–1.32. Coloration: Black or nearly so, including eyes (fig. 9); antennal segments 2, 3, and 4 and tibiae lighter, but always at least weakly infuscate; tibial spines black with obscure dark bases. Surface and Vesture: Dorsum very faintly rugose, pronotum and scutellum weakly shining, hemelytra appearing dull; dorsum with long, dark, reclining simple setae intermixed with silvery, woolly setae (fig. 4B, C). Structure: Hemelytra extremely elongate, nearly parallel-sided (fig. 9), apex of abdomen reaching only to cuneal fracture; labium just reaching middle trochanters; claws sharply curving near apex, pulvilli about one-half the length of claw, free except at base (fig. 4D). Male genitalia: Vesica S-shaped, attenuated apically; gonopore subapical, very weakly sclerotized; gonopore sclerite absent (fig. 14).

Female: Total length 3.62–3.98, length apex clypeus–cuneal fracture 2.75–2.96, width across pronotum 1.25–1.32; elongate ovoid (fig. 9).

Host: Sarcobatus vermiculatus (Chenopodiaceae).

Distribution: Northern Great Basin.

Discussion: The majority of specimens of M. knowltoni are labeled as having been taken on Sarcobatus vermiculatus.

Fig. 4. *Megalopsallus knowltoni*, female, scanning micrographs. A. Lateral view of head and thorax. B. Mesothoracic spiracle and metathoracic scent gland evaporatory area. C. Detail of setae on thoracic pleuron. D. Ventral view of pretarsus.


*Megalopsallus marmoratus* Knight

Figures 9, 15

*Megalopsallus marmoratus* Knight, 1968: 27 (n. sp).

**Diagnosis:** Recognized by brownish coloration and marmorate membrane (fig. 9). Most similar in overall coloration to *brittoni* and *femoralis*, but those species both lacking marmorate membrane. Marmorate membrane known to occur elsewhere in *Megalopsallus* only in *californicus*, that species otherwise being pale green.

**Redescription:** *Male:* Moderately small, total length 3.00–3.26, length apex clypeus–cuneal fracture 1.99–2.20, width across pronotum 0.94–1.04. COLORATION: Generally tan, much of body and femora with darker brown or reddish spots; eyes brown; entire membrane marmorate (fig. 9); tibial spines pale with reddish or brownish bases. SURFACE AND VESTITURE: Dorsum smooth, dull, rather sparsely clothed with recumbent, brown, simple setae intermixed with silvery, weakly flattened setae. STRUCTURE: Weakly elongate, nearly parallel-sided (fig. 9); labium reaching well onto hind trochanters; claws elongate, curving; pulvilli minute. MALE GENITALIA: Vesica relatively short, S-shaped, with a short decurved apex; gonopore subapical; no gonopore sclerite (fig. 14).

*Female:* Total length 2.57–3.01, length
Fig. 5. Habitus of *Megalopsallus nicholi*, male (Mexico, Zacatecas, 13 mi SW of Concepcion del Oro).

apex clypeus–cuneal fracture 1.84–2.16, width across pronotum 0.96–1.13; ovoid (fig. 14); body form elongate ovoid (fig. 9).

**Hosts:** *Allenrolfea occidentalis, Salicornia* sp. (Chenopodiaceae).

**Distribution:** Arizona, southern California, and Baja California Norte.

Fig. 6. Habitus of *Megalopsallus nigricaput*, male (Arizona, Graham Co., Stockton Pass, Pinaleno Mts).

*Megalopsallus nicholi* (Knight)

Figures 5, 9, 15

*Europiella nicholi* Knight, 1968: 42 (n. sp.).
*Megalopsallus nicholi*: Schuh et al., 1995: 389 (n. comb.).

**DIAGNOSIS:** Recognized by castaneous head, pronotum, and scutellum contrasting with pale corium, clavus, and membrane, and cuneus always at least weakly darkened and reddish (figs. 5, 9). Most easily confused with pale specimens of *humeralis* (fig. 9), the latter also breeding on *Lycium* spp.; distinguished from *humeralis* by darkened cuneus contrasting with remainder of hemelytra. Genitalia also absolutely distinctive from those of *humeralis*. Also similar in general appearance to *Sarcoba-
tus-feeding *rubricornis* (fig. 11), but that species always with cuneus unicolorous with remainder of pale hemelytra and head, with pronotum and scutellum often more strongly reddish.

**Redescription:** *Male:* Moderately small, total length 3.02–3.48, length apex clypeus–cuneal fracture 1.95–2.24, width across pronotum 0.98–1.06. **COLORATION:** Head, pronotum, and undersurface castaneous or chocolate brown, scutellum partly or entirely, and sometimes femora also, brown; hemelytra and often much of scutellum cream colored, cuneus weakly to strongly reddish brown (fig. 9); eyes dark brown; antennae and tibiae pale; tibial spines dark with faintly darkened bases. **SURFACE AND VESTITURE:** Dorsum smooth, weakly shining, clothed with pale to brown recumbent simple setae intermixed with golden, shining recumbent setae and some patches of woolly silvery setae. **STRUCTURE:** Moderately elongate, nearly parallel-sided (fig. 9); labium reaching to about posterior margin of middle trochanters; claws nearly straight and sharply curving at apex, pulvilli large and covering nearly entire ventral claw surface. **MALE GENITALIA:** Vesica elongate, S-shaped, apex in the form of a fingerlike projection adorned with tiny spicules; gonopore subapical, well developed; no gonopore sclerite (fig. 15).

*Female:* Total length 2.37–2.59, length apex clypeus–cuneal fracture 1.79–1.95, width across pronotum 0.88–1.02; very broadly ovoid, rotund, membrane short (fig. 9).

**Hosts:** *Lycium andersonii*, L. sp. (*Solanaceae*). Other reported hosts with limited confirmation: *Shepherdia argentea* (Elagagnaceae); *Condalia globosa* (*Rhamnaceae*); *Solanum eleagnifolium*. Probable sitting records: *Quercus arizonica*.

**Distribution:** Arizona and Nevada south to Zacatecas, Mexico.

**Discussion:** Knight (1968) described this species on the basis of specimens collected on *Lycium torreyi*. The majority of subsequent records are from *Lycium* spp., although the records from *Condalia* and *Shepherdia* may indicate that those plants are occasionally used as hosts as well.


**Megalopsallus nigricaput**, new species

**Figures 6, 9, 15**


**Discussion:** Recognized unequivocally by the dark head, first antennal segment, coxae, femora, and thoracic sternum in contrast to
Fig. 13. Male genitalic structures, vesicae of *Megalopsallus* spp. gs = gonopore sclerite.

otherwise almost white to weakly greenish coloration (figs. 6, 9). Probably most easily confused with *rubricornis* (fig. 11), but in that species pronotum and scutellum always red to castaneous.

**DESCRIPTION:** Male: Medium sized, total length 3.35–3.44, length apex clypeus–cuneal fracture 2.23–2.33, width across pronotum 1.02–1.10. COLORATION: Generally white with a faint greenish cast; head including eyes, antennal segment 1, coxae, trochanters, femora, and apex of labium castaneous and strongly contrasting with remainder of body and appendages (fig. 9). SURFACE AND VESTITURE: Head weakly shining, remainder of dorsum smooth and dull; dorsum clothed with pale recumbent, simple setae intermixed with scattered, silvery, weakly flattened setae. STRUCTURE: Elongate ovoid (fig. 9); labium reaching to
middle trochanters; claws long, slender, smoothly curving, pulvilli minute. MALE GENITALIA: Vesica elongate, S-shaped, apex membranous; gonopore subapical, sclerotized; no gonopore sclerite (fig. 15).

Female: Total length 3.11–3.24, length apex clypeus–cuneal fracture 2.19–2.36, width across pronotum 1.04–1.06; just slightly more ovoid than male (fig. 9).

ETYMOLOGY: Named for the contrasting dark coloration of the head relative to the remainder of the body; from the Latin niger, black, and caput, head.

HOSTS: Lycium pallidum (Solanaceae); Shepherdia argentea (Eleagnaceae).

DISTRIBUTION: Arizona, Nevada, and Utah.


Megalopsallus nigrofemoratus (Knight)
Figures 10, 15

Europiella nigrofemoratus Knight, 1968: 39 (n. sp.).

Megalopsallus nigrofemoratus: Schuh et al., 1995: 389 (n. comb.).

Europiella grayiae Knight, 1968: 41 (n. sp.). NEW SYNONYMY.

Megalopsallus grayiae: Schuh et al., 1995: 389 (n. comb.).

Europiella montanae Knight, 1968: 45 (n. sp.). NEW SYNONYMY.

Megalopsallus montanae: Schuh et al., 1995: 389 (n. comb.).

DIAGNOSIS: Recognized by frequently dark coloration of most of dorsum and femora, or at least head, pronotum, scutellum, and femora dark and contrasting with pale hemelytra (fig. 10). Most easily confused with humeralis (fig. 10) on basis of size, coloration, and type of sexual dimorphism; readily recognized by structure of male genitalia, vesica in nigrofemoratus being more elongate and slender than that of humeralis, and its association with Atriplex and Grayia, whereas humeralis feeding only on Lycium. Pale specimens separated from the Lycium-feeding nicholi by having the cuneus unicolorous with corium.

REDESCRIPTION: Male: Small to medium sized, total length 3.13–3.88, length apex clypeus–cuneal fracture 2.00–2.46, width across pronotum 0.97–1.16. COLORATION: Dorsum varying from largely deep blackish-brown to having the hemelytra somewhat lighter to much lighter (fig. 10); eyes blackish; antennae usually reddish, sometimes almost entirely pale; femora varying from dark or darkened to pale with a reddish cast and sometimes red spots, tibiae pale, tibial spines dark with dark bases; underside of body dark. SURFACE AND VESTITURE: Dorsum smooth, very weakly shining, clothed with recumbent, dark, simple setae intermixed with woolly, silvery setae. STRUCTURE: Weakly to strongly elongate, parallel-sided, specimens in some populations relatively more elongate than those in others; labium reaching posterior margin of middle trochanters; claws relatively short and straight, curving sharply near apex, pulvilli of moderate size, attached to claw only at base of pulvillus. MALE GENITALIA: Vesica elongate, strongly curving, apex membranous, gonopore subapical, gonopore sclerite well developed (fig. 15).

Female: Total length 2.33–2.85, length apex clypeus–cuneal fracture 1.65–2.08, width across pronotum 0.90–1.06; ovoid, often much shorter and more robust than male (fig. 10).


DISTRIBUTION: Interior of western North
America from Alberta, Canada, south to Zacatecas, Mexico.

**Discussion:** Knight (1968) described the species *grayiae* and *montanae* on the basis of material from a single locality or area, comprising relatively homogeneous samples with limited host data. After having examined a very large number of specimens from many localities, most with associated host information, I conclude that *grayiae* and *montanae* fall within the range of variation of *nigrofemoratus* and therefore treat the three nominal species as synonymous.

**Specimens Examined:** CANADA. — **Alberta:** Mayberries, July 8, 1952, L. A. Konotopetz, *Sarcobatus* sp. (Chenopodiaceae), 8♀, 10♂ (CNC). **Saskatchewan:** Wood Mountain, August 8, 1955, A. R. Brooks, 2♀ (CNC). MEXICO. — **Baja California Norte:** 12 mi E of El Rosario, March 25, 1979, J. D. Pinto, *Atriplex* sp. (Chenopodiaceae), 1♂ (UCR). **Nuevo Leon:** Santa Ana, Sep-
Fig. 15. Male genitalic structures, vesica of *Megalopsallus* spp. Left paramere and phallotheca of *M. nigrofemoratus*. gs = gonopore sclerite.
Fig. 16. Male genitalic structures, vesicae of *Megalopsallus* spp. Left paramere and phallotheca of *M. sarcobati*. gs = gonopore sclerite.


**Megalopsallus nuperus** (Van Duzee)

Figures 10, 15, 17

*Oncotylus nuperus* Van Duzee, 1923: 157 (n. sp.).

*Megalopsallus nuperus*: Carvalho, 1958: 72 (cat., n. comb.).

*Megalopsallus diversipes* Knight, 1927: 226 (n. sp.). NEW SYNONYMY.

*Megalopsallus diversipes latifrons* Knight, 1927: 226 (n. ssp.). NEW SYNONYMY.

**DIAGNOSIS**: Recognized by generally pale yellowish coloration, red (usually) protuberant eyes, and often reddish coloration of the femora. Most similar in general appearance to *brittoni* in having protuberant eyes and lacking sexual dimorphism, but distinguished by lack of spots at bases of setae on dorsum. Similar to *atriplicis* and *rubropictipes* in red protuberant eyes, but those species much more strongly sexually dimorphic and males more elongate in *rubropictipes; atriplicis* usually with red spots on the head and pronotum.

**REDESCRIPTION**: Male: Moderate-sized, total length 3.10–3.45, length apex clypeus–cuneal fracture 2.27–2.56, width across pronotum 1.02–1.13. COLORATION: Entire body and appendages pale, yellowish; eyes usually red, sometimes gray (fig. 10). SURFACE AND VESTITURE: Dorsum smooth, dull, or very weakly shining, clothed with pale, recumbent, simple setae intermixed with silvery, weakly flattened, somewhat woolly setae (fig. 17D). STRUCTURE: Relatively stout-bodied, corial margins nearly straight; labium reaching to posterior margin of hind trochanters or slightly beyond; claws elongate, slender, smoothly curving, pulvilli minute (fig. 17E). MALE GENITALIA: Vesica relatively short, twisted, apex attenuated and sclerotized; gonopore subapical; gonopore sclerite not developed (fig. 15).

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Fig. 17. *Megalopsallus nuperus*, male, scanning micrographs. **A.** Lateral view of head and thorax. **B.** Lateral view of male abdomen. **C.** Mesothoracic spiracle and metathoracic scent gland evaporatory area. **D.** Detail of setae comprising dorsal vestiture. **E.** Inner surface of claw.
Female:  Total length 3.22–3.27, length apex clypeus–cuneal fracture 2.40–2.92, width across pronotum 1.05–1.33; more robust in appearance than male (fig. 10).

HOSTS: Salicornia sp., Suaeda diffusa, S. sp. (Chenopodiaceae); Batis sp. (Bataceae). Probable sitting record: Dondea linearis (Apiaceae).

DISTRIBUTION: Sinaloa, Mexico east to Gulf Coast of Florida and north to Utah and Colorado in the West; Hispaniola.

DISCUSSION: I have examined the holotype male of M. nuperus [‘‘S. Francisco I., Gulf Calid., May 30, 1921, EP Van Duzee Collector,’’ (CAS)]. The overall coloration is pale, yellowish, the hind femora being slightly tinged with red. It compares favorably with a long series of specimens collected on Salicornia by Kelton at Mazatlan, Sinaloa, Mexico.

Comparison of nuperus, diversipes, and latifrons has forced me to conclude—in the absence of further information in the form of well-preserved, host-associated specimens—that all of these nominal species should be treated as synonymous. The combined distribution of this species ranges from the Gulf of California to the Gulf Coast of Florida north into Colorado and parts of Utah. Even though there is some variation in size, virtually all specimens are pale. The genitalia are all very similar, showing some variation in size, vir-...
Megalopsallus pallidus (Knight),
new combination
Figures 10, 15, 18

*Nevadocoris pallidus* Knight, 1968: 60 (n. sp.).

**Diagnosis:** Recognized by relatively large size and entirely pale yellowish coloration (fig. 10). Possibly most easily confused with *schwartzi* (fig. 12), but lacking red eyes, and occurring exclusively on *Atriplex*, rather than *Sarcobatus*.

**Redescription:** **Male:** Moderately large, total length 4.01–4.34, length apex clypeus–cuneal fracture 2.61–2.83, width across pronotum 1.09–1.19. **COLORATION:** Entire body and appendages pale, yellowish white, including eyes. **SURFACE AND VESTITURE:** Dorsum smooth, dull, clothed with pale, shining, recumbent, simple setae intermixed with shining, silvery, slightly flattened setae (fig. 18B). **STRUCTURE:** Hemelytra elongate, nearly parallel-sided, apex of abdomen only slightly surpassing cuneal fracture; labium reaching to posterior margin of hind trochanters; claws nearly straight, curving only near apex; pulvilli large, extending nearly entire length of claw (fig. 18C). **MALE GENITALIA:** Vesica S-shaped, apex membranous; gonopore subapical, not heavily sclerotized; no gonopore sclerite (fig. 15).

**Female:** Total length 3.24–3.76, length apex clypeus–cuneal fracture 2.34–2.68, width across pronotum 1.08–1.28; body form ovoid, robust (fig. 10).

**HOSTS:** *Grayia spinosa*, *Atriplex* sp. (Chenopodiaceae).

**DISTRIBUTION:** Central and southern Nevada.

**Discussion:** Knight (1968) placed *pallidus* in *Nevadocoris* on the basis of pulvillar structure, coloration, and antennal structure. Examination of the male genitalia indicates that *pallidus* is a *Megalopsallus* species, a placement corroborated by its known occurrence only on species of *Atriplex* and *Grayia*.
(Chenopodiaceae). *Nevadocoris becki*, the type of the genus in which *pallidus* was originally placed, has male genitalia dissimilar in structure to those of species here placed in *Megalopsallus* and breeds on members of the Asteraceae, including *Tetradymia* and *Chrysothamnus*.


*Megalopsallus pallipes* (Knight), new combination

Figures 10, 14

*Ankylotylos pallipes* Knight, 1968: 56 (n. sp.).

*Merinocapsus pallipes* Schuh, 1986: 224 (n. comb., diag. figs. distr.).

DIAGNOSIS: Recognized by generally pale coloration, except for the largely red-orange to brown pronotum and scutellum; labium relatively short, reaching only between fore and middle coxae. Similar in general coloration to some pale specimens of *nigrofemoratus*, but head always pale in *pallipes* and dorsal surface distinctly dull. Breeds only on *Ephedra*.

REDESCRIPTION: Male: Medium sized elongate, total length 3.49–4.13, length apex clypeus–cuneal fracture 2.36–2.62, width across pronotum 0.96–1.14. COLORATION: Head and hemelytra pale, pronotum and scutellum partially to entirely orange-brown to brown; underside of thorax mostly pale orange, abdominal venter pale green; eyes brown; appendages largely pale orange, antennae and tibiae lighter than coxae and femora; tibial spines pale with pale bases. SURFACE AND VESTITURE: Head, pronotum, and scutellum smooth, dull, almost powdery in appearance, hemelytra very weakly shining; dorsum clothed with pale recumbent simple setae intermixed with flattened silvery setae. STRUCTURE: Elongate, parallel-sided (fig. 9); labium short, reaching to about midpoint of mesosternum; claws nearly straight over much of length, curving sharply near apex, pulvilli small. MALE GENITALIA: Vesica relatively short, twisted, apex bifid, secondary gonopore subapical, gonopore sclerite small and weakly sclerotized (fig. 14).

Female: Total length 3.18–3.48, length apex clypeus-cuneal fracture 2.21–2.38, width across pronotum 1.00–1.04; elongate ovoid (fig. 10).

HOSTS: *Ephedra* spp. (Ephedraceae).

DISCUSSION: Although the coloration of *pallipes* is quite different from that of *ephe- drae* and *froeschneri*, the bifid apex of the vesica nonetheless suggests a close relationship with those species.

DISTRIBUTION: Southern Nevada and Utah.

and M. D. Schwartz, _Ephedra torreyana_ (Ephedraceae), 3♂, 4♀ (AMNH). Glen Can- 
yon Recreation Area, 12 mi S of Rt. 263, T40S R14E, 4300 ft, June 17, 1983, R. T. 
Schuh and M. D. Schwartz, _Ephedra torrey-
ana_ (Ephedraceae), 1♂, 5♀ (AMNH). Goosenecks Overlook, 5000 ft, June 17, 1983, R. T. 
Schuh and M. D. Schwartz, _Ephedra torreyana_ (Ephedraceae), 7♂, 11♀ (AMNH). 
Goosenecks Overlook, 5000 ft, June 17, 1983, R. T . Schuh and M. D. Schwartz, 
_Ephedra cutleri_ (Ephedraceae), 4♂, 7♀ (AMNH). Washington 
Co.: 3.5 mi E of La Verkin, June 25, 1980, R. T . Schuh, _Ephedra sp._ (Ephedra-
ceae), 2♀ (AMNH).

**Megalopsallus parapunctipes**, new species

_Figures 10, 15_

**HOLOTYPE**: Male, Nevada: Eureka Co., 12 
mi N of Rt. 50 on Rt 278, 5800 ft., June 27, 
(Chenopodiaceae). Deposited in the American 
Museum of Natural History.

**DIAGNOSIS**: Recognized, in common with 
*_punctipes* and *sarcobati*, by generally pale 
green coloration, including appendages, 
white eyes, and pale brown spots on femora 
(fig. 10). Distinguished from them by infus-
cate thoracic sternum and form of male gen-
titalia (compare figs. 15 and 16), and also 
from *Sarcobatus*-feeding *sarcobati* by that 
species’ larger size and broader head. Similar 
in size and general appearance to _sparsus_, 
but eyes almost always black in _sparsus_; also _sparsus_ usually with some dark areas on 
head, pronotum, and femora. Distinguished 
from generally pale _schwartzii_ by red eyes of 
that species and its lack of spots on femora.

**DESCRIPTION**: _Male_: Medium sized, total 
length 3.28–3.72, length apex clypeus–cu-
neal fracture 2.12–2.42, width across pronot-
um 0.91–1.00. **COLORATION**: General 
coloration of body and appendages pale green, 
including eyes; underside of thorax and ab-
domen often darkened in males; femora with 
some small dark spots; tibial spines pale with 
dark bases (fig. 10). **SURFACE AND VES-
TTURE**: Dorsum smooth, very weakly shin-
ing, clothed with pale, recumbent, simple se-
tae intermixed with silvery, shining, weakly 
flattened setae. **STRUCTURE**: Elongate, 
costal margins weakly convex; labium reach-
ing to posterior margin of middle trochant-
ers; claws elongate and smooth, curving 
over entire length; pulvilli small. **MALE 
GENITALIA**: Vesica in the form of a J, apex 
attenuated; gonopore delicate, subapical; no 
gonopore sclerite (fig. 15).

**Female**: Total length 2.43–2.75, length 
apex clypeus–cuneal fracture 1.78–2.08, 
width across pronotum 0.87–1.03; body form 
ovate, robust (fig. 10).

**ETYMOLOGY**: Named for its similarity of 
appearance to _Megalopsallus punctipes_ 
(Knight).

**HOST**: _Atriplex canescens, A. confertifolia_, 
_A. sp._ (Chenopodiaceae).

**DISTRIBUTION**: Interior western North 
America, from California, Nevada, and Utah.

**PARATYPES**: USA. — **California**: _Mono 
Co._: 8 mi W of Nevada state line on Rt. 359, 
6700 ft, July 2, 1983, R. T . Schuh and M. D. 
Schwartz, _Atriplex confertifolia_ (Chenopodi-
aceae), 8♂, 8♀ (AMNH). _Riverside Co._: 
Thousand Palms, November 24, 1955, W. R. 
Richards, 7♂, 6♀ (CNC). _Santa Barbara 
Co._: 8 mi E of New Cuyama, 2000 ft, May 
10, 1985, R. T. Schuh, _Atriplex sp._ (Cheno-
podiaceae), 12♂, 20♀ (AMNH). **Nevada**: 
_Eureka Co._: 12 mi N of Rt. 50 on Rt 278, 
5800 ft., June 27, 1983, R. T. Schuh and M. D. 
Schwartz, _Atriplex confertifolia_ (Cheno-
podiaceae), 68♂, 56♀ (AMNH). _Lander Co._: 
7.5 mi S of Rt. 50 on Rt 376, 5900 ft, June 
28, 1983, Schuh and Schwartz, _Atriplex confertifolia_ 
(Chenopodiaceae), 4♂, 9♀ (AMNH). _Nye Co._: Cumberland Canyon 
Road, Toquima Mts, T14N R44E, 6400 ft, 
June 28, 1983, R. T. Schuh and M. D. 
Schwartz, 3♂ (AMNH). Rock V. on Jackass 
Flats Road, 3300 ft, June 6, 1983, Schuh, 
Schwartz, Stonedahl, 2♂, (AMNH). Atomic 
Test Site, 6.5 mi S GS500 on Jackass Flats 
Rd, 3300 ft, June 6, 1983, Schuh, Schwartz, 
and Stonedahl, _Atriplex confertifolia_ 
(Chenopodiaceae), 3♂, 28♀ (AMNH). Atomic 
Test Site, 2 mi E of Mercury Hwy on Tweezer 
Rd, 3800 ft, June 8, 1983, Schuh, Schwartz, 
and Stonedahl, _Atriplex confertifolia_ 
(Chenopodiaceae), 26♂, 49♀ (AMNH). 2.8 mi E 
of Mercury Hiway on Tweezer Road, 3800 
ft, June 8, 1983, Schuh, Schwartz, Stonedahl, 
_Atriplex confertifolia_ (Chenopodiaceae), 4♂
Psallus suaedae Knight, 1925: 34 (n. sp.); Carvalho, 1958: 127 (n. syn.).
Psallus pictipes: Van Duzee, 1923: 161 (n. comb., list).
Plagiognathus pictipes (Van Duzee), 1918: 305 (Chenopodiaceae), 12♀, 7♂ (AMNH).

Megalopsallus pictipes (Van Duzee),
new combination
Figures 11, 16
Plagiognathus pictipes (Van Duzee), 1918: 305 (n. sp.).
Psallus pictipes: Van Duzee, 1923: 161 (n. comb., list).
Psallus suaedae Knight, 1925: 34 (n. comb.); Carvalho, 1958: 127 (n. syn.).

DIAGNOSIS: Recognized by generally pale green coloration of dorsum and strongly contrasting deep red, often mottled, color of antennal segment 1 and all femora (fig. 11). Not easily confused with any other species.

REDESCRIPTION: Male: Small, total length 2.48–2.93, length apex clypeus–cuneal fracture 1.69–2.03, width across pronotum 0.83–0.87. COLORATION: General coloration of dorsum pale green, vertex and anterior margin of pronotum often with some reddish spotting; antennal segment 1, thoracic pleuron and venter, and all coxae, trochanters, and femora deep red or with reddish spots; eyes usually reddish; abdomen pale, usually greenish; antennal segments 2, 3, and 4 pale; tibiae pale with dark spots at bases of pale spines (fig. 11). SURFACE AND VESTIATURE: Dorsum smooth, weakly shining, clothed with recumbent, pale, simple setae; antennae intermixed with silvery, weakly flattened setae; STRUCTURE: Relatively stout; labium just reaching onto middle trochanters; claws relatively long and slender, smoothly curving; pulvilli minute. MALE GENITALIA: Vesica S-shaped, apex attenuated, sclerotized; gonopore subapical, sclerotized; no gonopore sclerite (fig. 16).

Female: Total length 2.50–2.63, length apex clypeus–cuneal fracture 1.75–1.89, width across pronotum 0.91–0.96; ovoid (fig. 11).

HOSTS: Allenrolfea occidentalis, Atriplex sp., Chenopodium sp., Sarcobatus vermiculatus, S. sp., Suada fruticosa, S. torreyana, Suada sp. (Chenopodiaceae). Probable sitting records: Donidia nigra, D. suffrutescens (Apiaceae); Haploappus acradenius (Asteraceae); Lycium andersonii (Solanaceae).

DISTRIBUTION: Interior western North America from northern Mexico north to southern Oregon.

DISCUSSION: Psallus suaedae Knight was synonymized with Psallus pictipes Van Duzee by Carvalho (1958). Examination of the male genitalia of the species indicates that it is clearly a species of Megalopsallus, a placement corroborated by the chenopodiaceous hosts.


Fig. 19. *Megalopsallus punctatus*, female, scanning micrographs. **A.** Lateral view of head and thorax. **B.** Mesothoracic spiracle and metathoracic scent gland evaporatory area. **C.** Detail of setae comprising dorsal vestiture. **D.** Lateral view of pretarsus.

*Megalopsallus punctatus*, new name, new combination

*Psallus atriplicis* Knight, 1968: 48 (n. sp.) (a junior secondary homonym of *Megalopsallus atriplicis* Knight, 1927).

**Diagnosis:** Unique among *Megalopsallus* species by virtue of having tiny brown spots covering most of the whitish dorsum (fig. 11). Most similar in size, general appearance, and coloration to *Oncotylus guttulatus* Uhler.

**Redescription:** Male: Moderately large, robust, total length 3.78–4.15, length apex clypeus–cuneal fracture 2.47–2.70, width across pronotum 1.16–1.27. **Coloration:** Entire body and appendages cream colored, including eyes, with a slight tinge of green, dorsum with small brown spots at the bases of simple setae; femora with some small brown spots; tibial spines pale with small dark bases (fig. 11). **Surface and Vestiture:** Dorsum smooth, very weakly shining, clothed with pale, reclining, simple setae intermixed with silvery, shining, weakly flattened setae (fig. 19C). **Structure:** Hemelytra relatively elongate, nearly parallel-sided (fig. 11); labium reaching to between middle and hind coxae; claws elongate and smoothly curving; pulvilli minute (fig. 19D). **Male Genitalia:** Vesica J-shaped, weakly twisted, apex very slightly attenuated past gonopore; gonopore sclerotized; no gonopore sclerite (fig. 16).

Female: Total length 3.16–3.29, length apex clypeus–cuneal fracture 2.27–2.40, width across pronotum 1.19–1.28; relatively heavy-bodied, ovoid, not so elongate as male (fig. 11).
ETHYMOLOGY: From the Latin, punctum, hole or spot, for the brown spots at the bases of the setae on the dorsum.

HOST: Atriplex canescens, A. sp. (Chenopodiaceae).

DISTRIBUTION: Southwestern United States from southern Nevada, Arizona and east to western Texas.

DISCUSSION: Knight (1968) described Psallus atriplicis as occurring on Atriplex at the Nevada Test Site. Examination of the male genitalia indicates clearly that this is not a Psallus species but rather belongs to Megalopsallus, even though it is somewhat unusual because of the spotting on the dorsum. The name atriplicis Knight becomes a junior secondary homonym upon transfer of this species to Megalopsallus, and I therefore propose the new name punctatus.


Megalopsallus punctipes (Knight)

Figures 11, 16, 20

Europiella punctipes Knight, 1968: 47 (n. sp.).

Megalopsallus punctipes: Schuh et al., 1995: 389 (n. comb.).

DIAGNOSIS: Recognized, in common with parapunctipes and sarcobati, by generally pale green coloration, including appendages, white eyes, and pale brown spots on femora (fig. 11). Distinguished most easily from parapunctipes by lack of infuscation on thoracic sternum and form of male genitalia (fig. 16), and from sarcobati by larger size and broader head of that species, as well as form of male genitalia. Similar in size and general appearance to sparsus, but eyes almost always black in sparsus; also sparsus usually with some dark areas on head, pronotum, and femora. Distinguished from schwartzi by that species having red eyes and lacking spots on femora.

REDESCRIPTION: Male: Medium sized, total length 2.91–4.12, length apex clypeus–cuneal fracture 1.93–3.16, width across pronotum 0.92–0.99. COLORATION: Entire body and appendages pale, greenish white; femora with scattered small brown spots (fig. 11); tibial spines pale with small brown bases.

SURFACE AND VESTITURE: Dorsum smooth, weakly shining, clothed with reclining, brown, simple setae and silvery woolly setae (fig. 20C). STRUCTURE: Moderately elongate, corial margins weakly convex (fig. 11); labium short, reaching point midway between fore and middle trochanters; claws elongate and curving; pulvilli small, covering about one-half of ventral claw surface (fig. 20D). MALE GENITALIA: Vesica in the form of a J, not twisted, apex membranous; gonopore small, conspicuously subapical; no gonopore sclerite (fig. 16).

Female: Total length 2.52–2.79, length apex clypeus–cuneal fracture 1.78–1.98, width across pronotum 0.91–1.06; ovoid (fig. 11).

HOSTS: Atriplex canescens, A. confertifolia, A. sp. (Chenopodiaceae).

DISTRIBUTION: Interior western North America from northern Mexico north to Oregon and east to western Texas.

Fig. 20. *Megalopsallus punctipes*, female, scanning micrographs. **A.** Lateral view of head and thorax. **B.** Mesothoracic spiracle and metathoracic scent gland evaporatory area. **C.** Detail of setae comprising dorsal vestiture. **D.** Lateral view of pretarsus.


**Diagnosis:** Recognized by dark reddish head, pronotum, scutellum (at least mesoscutum), and femora contrasting with generally pale hemelytra (except at extreme base) (fig. 11); antennal segments 1 and 2 generally distinctly reddish. Most easily confused with *Lycium* feeding *nicholi*, but that species always with cuneus at least weakly darkened.

**Redescription:** Male: Small to medium sized, total length 2.75–3.55, length apex clypeus–cuneal fracture 1.88–2.27, width across pronotum 0.92–1.05. COLORATION: Head, pronotum, anterior portion of scutellum, and under surface of thorax very deep red; extreme base of hemelytra (usually), antennal segments 1 and 2, coxae, trochanters, and femora usually reddish (fig. 11); antennae usually red, sometimes pale; most of hemelytra white; antennal segments 3 and 4 pale; abdomen pale green; eyes dark reddish to black; tibial spines black with reddish bases. SURFACE AND VESTITURE: Dorsum smooth, moderately polished and shining, clothed with pale, recumbent, simple setae. STRUCTURE: Hemelytra moderately elongate, corial margins very weakly convex (fig. 11); labium reaching to posterior margin of middle trochanters; claws relatively short and stout, curving only near apex; pulvilli relatively large, reaching to near apex of claw, free from claw except at base. MALE GENITALIA: Vesica S-shaped, apex membranous and projecting beyond gonopore ventrally; gonopore distinctly sclerotized; gonopore sclerite well developed (fig. 16).

**Female:** Total length 2.33–2.86, length apex clypeus–cuneal fracture 1.78–2.05, width across pronotum 0.89–1.06; body very short and stout, ovoid (fig. 11); antennal segment 2 varying from slender to spindle-shaped, depending on population (fig. 11).

**Hosts:** *Sarcobatus vermiculatus*, *S.* sp. (Chenopodiaceae).

**Distribution:** Southern Oregon south to Arizona and east to Utah.

Megalopsallus rubropictipes Knight
Figures 12, 16

Megalopsallus rubropictipes Knight, 1927: 225 (n. sp.).

Diagnosis: Recognized by relatively large size, pale green coloration, red eyes, and reddish femora (fig. 12). Similar to nuperus in general appearance and lack of strong sexual dimorphism (except in some populations of rubropictipes), but distinguished from that species by consistently more greenish coloration.

Redescription: Male: Medium sized, total length 3.36–3.62, length apex clypeus–cuneal fracture 2.31–2.47, width across pronotum 1.03–1.11. Coloration: General coloration greenish white, femora usually with some distinct reddish areas, in the form of spots or suffusion; eyes red (fig. 12); tibial spines pale, bases of spines often pale, at most pale brown. Surface and Vestiture: Dorsum smooth, pronotum and scutellum weakly shining, hemelytra dull; dorsum clothed with pale or brown recumbent setae intermixed with silvery, woolly setae. Structure: Moderately elongate, costal margin of hemelytra weakly convex (fig. 12); labium reaching at least onto hind trochanters, sometimes slightly beyond; claws long, smoothly curving; pulvilli minute. Male Genitalia: Vesica S-shaped, apex attenuated and sclerotized, general structure very similar to nuperus; gonopore sclerotized and subapical; no gonopore sclerite (fig. 16).

Female: Total length 2.50–3.41, length apex clypeus–cuneal fracture 2.14–2.45, width across pronotum 0.98–1.16; usually
macropeterous and slightly more robust than male, sometimes brachypterous, with hemelytra greatly shortened with apex of abdomen projecting beyond posterior margin of reduced membrane (fig. 12).


DISTRIBUTION: Interior western North America from Alberta and Saskatchewan south to New Mexico and west to Oregon.

DISCUSSION: Some populations of rubropictipes show strong sexual dimorphism. The females have short hemelytra that barely cover the abdomen, which accounts for the great variation in total length between the sexes.


Megalopsallus sarcobati (Knight)

Figures 12, 16, 21

Europiella sarcobati Knight, 1969: 83 (n. sp.).

Megalopsallus sarcobati: Schuh et al., 1995: 389 (n. comb.).
**Eupopiella multipunctipes** Knight, 1970: 229 (n. sp.). New synonymy.

**Megalopsallus multipunctipes**: Schuh et al., 1995: 389 (n. comb.).

**Diagnosis**: Recognized, in common with *parapunctipes* and *punctipes*, by generally pale green coloration, including appendages, white eyes, and pale brown spots on the femora, but differing from both species in lack of distinct sexual dimorphism, larger size, broader head (fig. 12), distinctive differences in structure of male genitalia (fig. 16), and host preferences.

**Redescription**: *Male*: Moderately small, broad-bodied, total length 3.04–3.26, length apex clypeus–cuneal fracture 2.05–2.22, width across pronotum 1.01–1.08. **Coloration**: Pale green (often dirty yellow in poorly preserved specimens); eyes pale (fig. 12); femora with numerous small brown spots; tibial spines pale with brown bases. **Surface and Vestiture**: Dorsum smooth, weakly shining, clothed with pale or light brown setae intermixed with silvery, slightly flattened setae (fig. 21C). **Structure**: Relatively broad bodied and ovoid; head short and broad, eyes relatively small (fig. 12); labium reaching to about posterior margin of middle trochanters; claws elongate, nearly straight over two-thirds of length, curving apically; pulvilli moderately large, covering about two-thirds of ventral claw surface (fig. 21D). **Male Genitalia**: Vesica S-shaped, sclerotized and attenuated apically, gonopore subapical; gonopore large, covering about two-thirds of ventral margin of middle trochanters; claws elongate, nearly straight over two-thirds of length, curving apically; pulvilli moderately large, covering about two-thirds of ventral claw surface (fig. 21D). **Female**: Total length 2.92–3.34, length apex clypeus–cuneal fracture 2.13–2.45, width across pronotum 1.07–1.21; ovoid, often difficult to separate from male as viewed from above (fig. 12).

**Hosts**: *Sarcobatus vermiculatus*, *Sarcobatus baileyi* (Chenopodiaceae).

**Distribution**: Interior western North America from southern Nevada south to southern Washington south to Colorado.

**Discussion**: Examination of the material upon which Knight (1970) based his original description of *multipunctipes* indicates that this nominal taxon is the same as *sarcobati*, and I am therefore treating it as a junior synonym. Knight noted that his specimens of *multipunctipes* "were from a shrub I thought must be an Atriplex." All verified host records for this species are from *Sarcobatus*, Knight’s observation apparently being in error. The single record from *S. baileyi* is the exception among the many known occurrences on *S. vermiculatus*.

Fig. 21. *Megalopsallus sarcobati*, male, scanning micrographs. A. Lateral view of head and thorax. B. Mesothoracic spiracle and metathoracic scent gland evaporatory area. C. Detail of setae comprising dorsal vestiture. D. Lateral view of pretarsus.


*Megalopsallus schwartzi*, new species

Figures 12, 16

**Megalopsallus sparsus** (Van Duzee)  
Figures 12, 16

_Europiella sparsa_ Van Duzee, 1918: 305 (n. sp.).  
Megalopsallus sparsus: Schuh et al., 1995: 389 (n. comb.).

_Europiella stitti_ Knight, 1968: 46 (n. sp.) NEW SYNONYMY.  
Megalopsallus stitti: Schuh et al., 1995: 389 (n. comb.).

_Europiella franserieae_ Knight, 1969: 85 (n. sp.);  
Henry, 1985: 1124 (n. syn.). REVISED SYNONYMY.

Megalopsallus franserieae: Schuh et al., 1995: 389 (n. comb.).

**DIAGNOSIS:** Recognized among small, at least partly greenish, _Megalopsallus_ species by gray to black eyes and frequently dark head, anterior lobe of pronotum, and mesoscutum (fig. 12). Thoracic pleuron and venter and abdominal venter infuscate in male, pale in female. Most easily confused with _parapunctipes_ and _punctipes_ on basis of size, sexual dimorphism, general coloration, and host associations. Male genitalia distinctive (fig. 16).

**REDESCRIPTION:** _Male:_ Small to moderately small, total length 2.74–3.43, length apex clypeus–cuneal fracture 1.76–2.15, width across pronotum 0.90–1.04. COLORATION: Generally pale greenish or somewhat grayish (fig. 12); head (including face), anterior margin of pronotum, and mesoscutum often heavily infuscate; more rarely, nearly entire head, pronotum, and scutellum dark; hemelytra occasionally weakly to moderately infuscate; femora dark in darker specimens; eyes black; antennae always pale; underside of thorax and abdomen infuscate to very dark; tibial spines black with black bases.

**SURFACE AND VESTITURE:** Dorsum smooth and weakly shining, clothed with pale to brown, recumbent, simple setae intermixed with silvery, weakly flattened setae. STRUCTURE: Hemelytra relatively short to moderately elongate (fig. 12); labium relatively short, just reaching middle trochanters; claws relatively short and broad, curving on apical one-third, pulvilli large, covering two-thirds of ventral claw surface. MALE GENITALIA: Vesica twisted, apex membranous; gonopore nearly apical, well sclerotized; gonopore sclerite developed (fig. 16).

_Female:_ Total length 2.30–2.71, length apex clypeus–cuneal fracture 1.67–2.03, width across pronotum 0.89–0.99; short and stout, broadly ovoid, often distinctly more so than males (fig. 12); underside of thorax and abdomen very faintly darkened in totally pale specimens (fig. 12).

**HOSTS:** _Atriplex canescens_, _A. confertifolia_, _A. hymenelytra_, _A. lentiformis_, _A. polycarpa_, _A. torreyi_, _A. sp._ (Chenopodiaceae). Probable sitting records: _Artemisia filifolia_, _Franseria deltoides_ (Asteraceae); _Sarcobatus vermiculatus_ (Chenopodiaceae); _Sphaeralcea sp._ (Malvaceae); _Lycium sp._ (Solanaceae).

**DISTRIBUTION:** Western North America from Alberta and Saskatchewan south to Baja California.

**DISCUSSION:** Henry (1985) synonymized _Europiella franserieae_ Knight, 1969, with _Europiella stitti_ Knight, 1968. The locality data and dates were identical for all specimens examined by Knight for these two nominal species, even though the labels were
not from the same printing. Knight (1969) recorded the host of "franseriae as Franseria deltoides. Extensive collecting in Arizona and southern California has never yielded breeding records of Megalopsallus on Franseria (= Ambrosia, Asteraceae), although my colleagues and I collected extensively on it and documented several other mirids as breeding on it. Comparison of the types of stitti and franseriae with a very large amount of material of sparsus, indicates that those two nominal species fall within the range of variation of sparsus, a variable and widely distributed taxon, and I am therefore treating them as synonyms, sparsus having priority.

In addition to the Franseria host record, other records from Artemisia, Sphaeralcea, Lycium, and possibly Sarcobatus would seem to represent sitting records and not breeding hosts.

Fig. 22. Habitus of Megalopsallus teretis, male (Nevada, Nye Co., Atomic Test Site, Tweezer Road at Orange Blossom Road, ex Lycium andersonii).

**Megalopsallus teretis**, new species

*Figures 12, 16, 22, 23*


**DIAGNOSIS:** Recognized by totally blackish brown coloration and spindle-shaped antennal segment 2 in female (figs. 12, 22, 23). Most easily confused with dark specimens of *humeralis* and *nigrofemoratus*, but distinguished by having totally dark tibiae whereas tibiae in those species pale with dark spots at bases of spines.

**DESCRIPTION:** Male: Small to medium sized, total length 2.82–3.60, length apex clypeus–cuneal fracture 1.87–2.25, width across pronotum 0.96–1.06. COLORATION: Entire body and hemelytra blackish brown; eyes usually dark; appendages, especially antennae, dark, but reddish (fig. 12); tibial spines black. SURFACE AND VESTI-
Fig. 23. Habitus of *Megalopsallus teretis*, female (Nevada, Nye Co., Atomic Test Site, Tweezer Road at Orange Blossom Road, ex *Lycium andersonii*).

TURE: Dorsum smooth, dull, clothed with recumbent, black, simple setae and white, appressed, woolly setae. STRUCTURE: Hemelytra moderately elongate, nearly parallel-sided; antennal segment 2 weakly inflated over most of length (figs. 12, 22); labium just reaching to middle trochanters; claws straight over most of length, curving near apex; pulvilli large, covering about two-thirds of length of claw. MALE GENITALIA: Vesica relatively long, S-shaped, with a long, sclerotized, apical attenuation; gonopore well removed from apex of vesica, distinctly sclerotized; gonopore sclerite relatively short (fig. 16).

Female: Total length 2.28–2.64, length apex clypeus–cuneal fracture 1.73–1.97, width across pronotum 0.94–1.02; much
shorter than male, very broadly ovoid (fig. 12); antennal segment 2 usually much more strongly swollen than in male, spindle shaped (fig. 12).

**ETYMOLOGY**: Named for the shape of antennal segment 2; from the Latin, *teretis*, cylindrical.

**HOSTS**: *Lycium andersonii*, *L. sp.* (Solanaceae). Probable sitting record: *Arctostaphylos patula* (Ericaceae).

**DISTRIBUTION**: Southern Nevada and Utah south to Zacatecas, Mexico.

**DISCUSSION**: There is a substantial disjunction between collection localities for this species. Nonetheless, the specimens from southern Nevada and Zacatecas, Mexico, are very similar in overall morphology and the structure of the male genitalia, and I am therefore treating them as belonging to a single taxon.


**NOTES ON OTHER SPECIES**

**PREVIOUSLY PLACED IN MEGALOPSALLUS**

*Europiella albipubescens* Knight, Incertae sedis

*Europiella albipubescens* Knight, 1968: 46 (n. sp.).

*Megalopsallus albipubescens*: Schuh et al., 1995: 389 (n. comb.).

**DISCUSSION**: Knight (1968) described *albipubescens* from the Nevada Test Site as occurring on *Chrysothamnus nauseosus*. He placed the species in *Europiella* in apparent error because the pulvilli are large and adnate to nearly the entire ventral surface of the claw, an attribute never found in *Europiella* spp. The transfer of this species to *Megalopsallus* by Schuh et al. (1995) is equally unsatisfactory and was not based on a critical examination of the male genitalia. Further study is required to determine a more satisfactory placement for this species.

*Europiella monticola* Knight, revised combination

*Europiella monticola* Knight, 1970: 230 (n. sp.).

*Megalopsallus monticola*: Schuh et al., 1995: 389 (n. comb.).

This species was erroneously transferred to *Megalopsallus* by Schuh et al. (1995).

**ACKNOWLEDGMENTS**

For field and technical assistance I offer special thanks to Michael Schwartz and Gary Stonedahl. Their contributions added greatly to the results presented here, in terms of specimen and host data, initial sorting and organization of material, and knowledge of genitalic morphology.

For reviews of the manuscript I thank Thomas Henry, I. M. Kerzhner, Jerome Rosen, Michael Schwartz, and James A. Slater.

Jeff Knight, University of Nevada, Reno, arranged permission to collect at the Department of Energy Atomic Test Site, Nye County, Nevada. Allen F. Guenther, Gila Bend, Arizona, formerly with the Arizona Fish and Game Commission, took me to what would have been otherwise inaccessible areas in southwestern Arizona. National Park Service personnel generously provided permission to collect at Organ Pipe Cactus National Mon-
### TABLE 1

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TABLE 1—(Continued)
<p>| Species    | Length  | Width  |  |  |
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|            | Total Body | Cn-Clyp | Pronotum | Head | InterOcDi | AntSeg2 |
| <strong>humeralis</strong> |          |        |          |      |           |         |
| M-S (N = 2) Mean | 2.62 | 1.77 | 0.33 | 0.16 | 0.94 | 0.8 | 0.44 | 0.67 |
| SD         | 0.06   | 0.05  | 0 | 0.02 | 0 | 0.01 | 0.01 | 0 |
| Range      | 0.09   | 0.07  | 0 | 0.02 | 0 | 0.02 | 0.02 | 0 |
| Min        | 2.57   | 1.74  | 0.33 | 0.15 | 0.94 | 0.79 | 0.43 | 0.67 |
| Max        | 2.66   | 1.81  | 0.33 | 0.18 | 0.94 | 0.81 | 0.45 | 0.67 |
| M-L (N = 6) Mean | 3.34 | 2.17 | 0.4 | 0.17 | 1.06 | 0.85 | 0.46 | 0.78 |
| SD         | 0.23   | 0.11  | 0.05 | 0.03 | 0.05 | 0.02 | 0.02 | 0.07 |
| Range      | 0.57   | 0.29  | 0.13 | 0.09 | 0.12 | 0.07 | 0.06 | 0.18 |
| Min        | 3.06   | 2.03  | 0.35 | 0.13 | 1 | 0.82 | 0.43 | 0.69 |
| Max        | 3.63   | 2.31  | 0.48 | 0.22 | 1.11 | 0.9 | 0.48 | 0.86 |
| F (N = 8)  Mean | 2.86 | 2.03 | 0.4 | 0.21 | 1.07 | 0.89 | 0.51 | 0.73 |
| SD         | 0.25   | 0.14  | 0.03 | 0.06 | 0.07 | 0.04 | 0.04 | 0.04 |
| Range      | 0.82   | 0.37  | 0.07 | 0.16 | 0.19 | 0.13 | 0.1 | 0.11 |
| Min        | 2.48   | 1.83  | 0.36 | 0.13 | 0.97 | 0.82 | 0.47 | 0.69 |
| Max        | 3.3    | 2.19  | 0.44 | 0.29 | 1.16 | 0.95 | 0.57 | 0.8 |
| <strong>knowltoni</strong> |          |        |          |      |           |         |
| M (N = 5)  Mean | 4.94 | 3.13 | 0.49 | 0.26 | 1.24 | 0.94 | 0.51 | 1.41 |
| SD         | 0.13   | 0.1   | 0.02 | 0.02 | 0.03 | 0.01 | 0.01 | 0.05 |
| Range      | 4.51   | 2.79  | 0.41 | 0.23 | 1.15 | 0.93 | 0.48 | 1.27 |
| Min        | 5.2    | 3.31  | 0.53 | 0.32 | 1.32 | 0.97 | 0.52 | 1.55 |
| Max        | 3.83   | 2.86  | 0.52 | 0.31 | 1.29 | 1.04 | 0.61 | 1.16 |
| F (N = 5)  Mean | 0.14 | 0.09 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.08 |
| SD         | 0.36   | 0.2   | 0.06 | 0.07 | 0.07 | 0.06 | 0.06 | 0.21 |
| Range      | 3.62   | 2.75  | 0.5 | 0.28 | 1.25 | 1 | 0.57 | 1.07 |
| Min        | 3.98   | 2.96  | 0.55 | 0.35 | 1.32 | 1.06 | 0.63 | 1.28 |
| Max        | 3.8    | 2.19  | 0.44 | 0.29 | 1.16 | 0.95 | 0.57 | 0.8 |
| <strong>marmoratus</strong> |          |        |          |      |           |         |
| M (N = 6)  Mean | 3.13 | 2.12 | 0.38 | 0.19 | 0.99 | 0.81 | 0.37 | 0.88 |
| SD         | 0.1    | 0.08  | 0.03 | 0.05 | 0.04 | 0.01 | 0.01 | 0.05 |
| Range      | 0.26   | 0.2   | 0.08 | 0.13 | 0.09 | 0.02 | 0.03 | 0.15 |
| Min        | 3.26   | 2.2   | 0.41 | 0.26 | 1.04 | 0.82 | 0.38 | 0.96 |
| Max        | 3.1    | 1.99  | 0.33 | 0.13 | 0.94 | 0.8 | 0.35 | 0.81 |
| F (N = 5)  Mean | 2.84 | 2.07 | 0.41 | 0.25 | 1.06 | 0.84 | 0.44 | 0.74 |
| SD         | 0.17   | 0.14  | 0.02 | 0.04 | 0.07 | 0.04 | 0.02 | 0.04 |
| Range      | 0.44   | 0.32  | 0.04 | 0.08 | 0.17 | 0.08 | 0.05 | 0.11 |
| Min        | 2.57   | 1.84  | 0.38 | 0.2 | 0.96 | 0.79 | 0.42 | 0.68 |
| Max        | 3.01   | 2.16  | 0.42 | 0.29 | 1.13 | 0.87 | 0.47 | 0.79 |
| <strong>nicholii</strong> |          |        |          |      |           |         |
| M(N=5)     Mean | 3.24 | 2.12 | 0.4 | 0.16 | 1.02 | 0.8 | 0.43 | 0.76 |
| SD         | 0.17   | 0.11  | 0.04 | 0.03 | 0.03 | 0.04 | 0.02 | 0.05 |
| Range      | 0.46   | 0.3   | 0.09 | 0.07 | 0.09 | 0.1 | 0.05 | 0.14 |
| Min        | 3.02   | 1.95  | 0.37 | 0.13 | 0.98 | 0.74 | 0.4 | 0.68 |
| Max        | 3.48   | 2.24  | 0.46 | 0.2 | 1.06 | 0.84 | 0.45 | 0.82 |
| F (N = 5)  Mean | 2.47 | 1.88 | 0.39 | 0.24 | 0.95 | 0.83 | 0.48 | 0.68 |
| SD         | 0.09   | 0.07  | 0.02 | 0.05 | 0.05 | 0.03 | 0.02 | 0.05 |
| Range      | 0.22   | 0.16  | 0.05 | 0.11 | 0.14 | 0.07 | 0.05 | 0.11 |
| Min        | 2.37   | 1.79  | 0.37 | 0.18 | 0.88 | 0.8 | 0.46 | 0.63 |
| Max        | 2.59   | 1.95  | 0.42 | 0.29 | 1.02 | 0.86 | 0.51 | 0.74 |
| <strong>nigricaput</strong> |          |        |          |      |           |         |
| M (N = 5)  Mean | 3.4   | 2.28 | 0.43 | 0.19 | 1.05 | 0.77 | 0.37 | 1.12 |
| SD         | 0.04   | 0.04  | 0.02 | 0.04 | 0.03 | 0.01 | 0.01 | 0.03 |
| Range      | 0.09   | 0.1   | 0.05 | 0.11 | 0.07 | 0.02 | 0.02 | 0.08 |
| Min        | 3.35   | 2.23  | 0.4 | 0.15 | 1.02 | 0.76 | 0.37 | 1.09 |
| Max        | 3.44   | 2.33  | 0.45 | 0.27 | 1.1 | 0.78 | 0.39 | 1.17 |</p>
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ument and Capitol Reef National Park. My father, the late Joe Schuh, introduced me to the halophyte flora of southern Oregon and northern California. John Pinto and his family provided valuable field assistance and hospitality in southern California. John, Irma, and Dan Polhemus provided hospitality and field support in Colorado. To all of these individuals and organizations I offer my sincere thanks.

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The herbarium staff at the New York Botanical Garden identified the host plants for material collected by Michael Schwartz, Gary Stonedahl, and me. These authoritative determinations add greatly to our confidence in knowledge of host relationships within *Megalopsallus*. My sincere thanks to Jackie Kallunki, Eileen Schofield, Arnold Tiehm, James Grimes, and others at the NYBG for their prompt and professional service.

Evert E. Lindquist (Agriculture and Agri-Food Canada, Ottawa) kindly identified mites of the genus *Balaustium* and provided the information on their life histories.

Many individuals and institutions generously provided material for this study, during the course of which more than 11,500 specimens were examined. Without their assistance, the diversity of the group would be much less well understood. Institutions, names of curators or other responsible individuals, and institutional abbreviations used in the presentation of locality data are given in the following list:

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Utah State University, Logan, Wilford Hanson (USU)

REFERENCES


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Stonedahl, G. M.

Van Duzee, E. P.

Wagner, E.
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