

# AMERICAN MUSEUM NOVITATES

Number 1239      Published by  
THE AMERICAN MUSEUM OF NATURAL HISTORY  
New York City

July 19, 1943

## A REVISION OF THE GENUS *COENONYCHA* (COLEOPTERA, SCARABAEIDAE)

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### INTRODUCTION

Prior to the present paper, the genus *Coenonycha* was represented in the described insect fauna of North America by eight species, most of which had been collected in widely separated geographical areas. The phylogenetic relationships in the genus were either not established or uncertain. In recent years, however, much has been discovered about the habits, hosts and behavior of these beetles, and many new species have been collected from a number of localities, thus making it possible to establish, at least partially, the interspecific relationships. This paper is designed to bring together all available information on the genus, to make known twenty new species, to give a key for the ready identification of all the known

species and to present a discussion of their phylogenetic relationships.

Due to the division of labor involved in a paper of this sort and the inconvenience resulting from dual authorship of species, the authorship of the new species described herein should be divided as follows: Cazier—*purshiae*, *ampla*, *hageni*, *pallida*, *bowlesi*, *lurida*, *acuta*, *barri*, *mediata*, *saylori* and *fuga*; McClay—*rubida*, *clypeata*, *fulva*, *fusca*, *globosa*, *ovatis*, *crispata*, *utahensis* and *scotti*.

The writers wish to express their appreciation to the institutions and individuals mentioned in the text for aid in supplying specimens and information pertaining to the genus *Coenonycha*.

### DISTRIBUTION

The genus is endemic to the western United States, primarily the southwest, and Guadalupe Island, Mexico (Fig. 1). In the United States, two species are known to occur in Washington, one in Oregon, three in Nevada, one in southern Utah, one in Arizona and twenty-two in California. One species is known from Guadalupe Island, Mexico. Throughout

this area they are confined to the drier regions, being most abundant in the chaparral districts of the coast, the foothills of the Sierra Nevada Mountains, the arid portions of the Great Basin, the Mojave and Colorado deserts and the San Joaquin Valley. The altitudinal distribution extends from sea level to about 4000 feet.

### BIOLOGY

Nothing is known about the life history of these beetles aside from the fact that the larvae are root-feeders and that the mating season is in the early spring, March and April in the coastal and desert regions,

and April and May in the Sierra Nevada Mountains.

Mr. P. C. Ting collected larvae of *Coenonycha tingi* on the roots of *Adenostoma fasciculatum*, on which plant the adults were also taken. If this close host association between adults and larvae is general

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throughout the genus, and there is no reason why it should not be, then the immature stages of *C. testacea* should be on the roots of *Eriogonum fasciculatum* and *Chyrsothamnus nauseosus*, those of *C. hageni* on *Eriogonum fasciculatum*, those of *C. purshiae* on *Purshia tridentata*, those of *C. ampla* on *Juniperus californicus*, those of *C. fuga* and *C. fusca* on *Adenostoma fasciculatum*, those of *C. pallida* and *C. mediata* on *Artemisia* species, those of *C. acuta* on *Adenostoma sparsifolium* and those of *C. barri* on *Atriplex spinifera*. The host plants of the re-

mainder of the species are unknown.

The adults of all species are nocturnal and may be taken either at lights or by beating the host plants at night. The only species that are known to fly to lights are *C. clypeata* and *C. fulva*. Several hundred adults of *C. testacea* were hand-picked at night from the terminal shoots of *Eriogonum fasciculatum* where they were either in copulation or were hanging on to the tips of the shoots with the four hind legs, waving their front legs and antennae into space. None was observed flying.

### PHYLOGENY

The genus *Coenonycha* is most closely allied to *Dichelonyx* and may have developed from this genus or, more probably, from an ancestral stock common to both genera. *Dichelonyx* appears to be northern in origin, having a wide Nearctic distribution extending from northern Lower California into British Columbia, eastward across Canada to Maine and south into Pennsylvania. Structurally it has remained rather generalized, and many of the species have extensive distributions. In the western states *Dichelonyx* is primarily a Vancouverian element, and its chief food plants in these areas are oaks and coniferous trees. The possibility of *Dichelonyx* developing from *Coenonycha* is rather remote as the latter genus is more specialized structurally and has developed numerous closely allied species in a relatively small area, thus indicating that it is not an archaic group.

Inasmuch as *Coenonycha* is most diversified and abundant in the arid western portions of the Great Basin, San Joaquin Valley, Mojave and Colorado deserts, it is probable that it arose in this region in response to conditions of aridity. The most primitive members of the genus, that is, those having fully developed metathoracic wings, dark pigment and pile throughout the body, occupy areas that are in the Upper Sonoran or Lower Transitional zone; whereas, the more specialized species, having reduced metathoracic wings, little if any pigment or pile, occupy typical

Sonoran zone habitats. The derivation of the specialized forms from their immediate and more generalized ancestors is rather easy to follow and supports the assumption that speciation in the genus is primarily in response to conditions of aridity.

Within the genus there appear to be three rather well-defined but closely allied groups of species, *hageni*, *fusca* and *testacea* (Fig. 2). Of these three groups the *hageni* complex, because of its pilosity, distribution, unspecialized head structures and stability of antennal segmentation, appears to be the most primitive. The *fusca* group is most closely allied to the *hageni* complex but has lost the pilosity; the head structures and especially the clypeus have become relatively more specialized; and the antennal segmentation is no longer stable. The *testacea* group appears to be the most specialized morphologically and has given rise to the majority of the highly specialized species.

The *hageni* group has three specialized species, *parvula*, *socialis* and *clementina*, and it also includes the species *fulva* and *clypeata* occupying Santa Catalina Island, as well as *scotti*, *rubida*, *acuta* and *hageni* that occur in the Upper Sonoran zone. In this group specialization and differentiation have taken place in response to insular isolation as well as to aridity. The approximate relationships of the species belonging to this group can be seen from the diagram

(Fig. 2), which does not, however, show adequately the correlation of these differences with the distribution of the species. *C. socialis* from Guadalupe Island and *C. clementina* from San Clemente Island are very closely allied to one another, in fact more so than are *clypeata* and *fulva* which occur together on Santa Catalina Island. Also, *socialis* and *clementina* are only distantly related to *clypeata* and *fulva*, and it seems probable that the former are derivatives of the primitive *hageni* group rather than direct relatives of either of the Santa Catalina Island species. *C. fulva* of the Santa Catalina Island species appears to be more closely related to the mainland species than to *clypeata* and possibly arose from the *hageni-acuta* branch. The occurrence of these two distantly related species on the same island is possibly the result of an invasion of the island originally by *clypeata* and then the re-invasion at a later date by *fulva*. The northern coastal *hageni* and the southern more inland *acuta* are almost certainly from the same stalk and may prove to represent subspecies rather than species

when additional material is available. *C. scotti* and *rubida* appear to be more closely allied to one another than to the rest of the *hageni* group, but there is great morphological as well as distributional discontinuity between the two. *C. parvula* appears to represent a reduced winged form of the *hageni* group with very uncertain relationships with the other species.

In the *fusca* group of five species, the specific relationships are more evident, as shown in Fig. 2, and the specialized, reduced winged *tingi* is almost certainly a direct derivative of *fuga*.

The third group, represented by the generalized *C. testacea*, *rotundata*, *utahensis* and eleven more specialized ones in two branches has, in response to varying degrees of aridity, developed species that are in varying stages of divergence from these generalized forms. The approximate development as it appears in the available material can be seen in Fig. 2. Specific divergence and specialization have taken place primarily in wing and clypeal development.

### SPECIATION

As is usual with a systematic analysis of this sort, there is no direct genetical or experimental evidence available on the degree of reproductive isolation in the various populations or samples. It is therefore necessary to correlate the fragments of indirect evidence, morphological differentiation, and geographical or ecological distribution, in an attempt to interpret, in the light of our present incomplete knowledge, the basic genetical changes that may have accompanied or caused the divergence of these indirect indicators.

If two morphologically different but closely allied species occur side by side in the same habitat without apparent hybridization, it can be assumed with reasonable assurance that genetical change has taken place in sufficient magnitude to isolate the populations reproductively. These populations are called sympatric species. If, however, two morphologically

distinct but allied populations do not occupy the same area, there is no indirect evidence of accompanying genetic change except as shown by the morphological divergence. These are called allopatric populations, and the interpretation of their classification status depends upon the degree of morphological differentiation. If the populations are separated by considerable geographical distance without apparent intermediate barriers (climatic, topographical, edaphic, etc.) the decision as to their status is largely arbitrary due to the lack of information. Some writers choose to call these populations allopatric species, whereas others prefer to recognize them as allopatric subspecies until further information is available. If the morphological divergence is great, there is good reason to recognize these populations as species, since geneticists have shown that genetic changes accompany geographical isolation, and in most cases these allo-

Fig. 1. Distribution of the genus *Coenonycha*.

patric entities would not be reproductively compatible if they were brought together. At least this is a reasonable risk to assume and does not necessitate the ungrounded assumption that hybridization between these populations is probable, and, furthermore, it does not ignore the evidence on the genetic effect of isolation. If a barrier is evident between these allopatric populations, then there is even more reason to call them allopatric species if morphological divergence is complete. When the allopatric populations are poorly separated morphologically and the distributional gap is small or without adequate barriers, it is, perhaps, somewhat justifiable to call these populations subspecies in order to show their close relationship.

With these points in mind the following discussion of the status of the *Coenonycha* samples will be more intelligible, especially to those systematists who are still unaware of the importance of such correlative interpretations.

*Coenonycha tingi* and *fusca* are sympatric species, as they are distinct morphologically and were collected on the same plants at the same time at Napa, Napa County, California. *C. tingi* appeared to be at the height of its breeding season at the time of collecting (March), and nearly a thousand specimens were gathered; whereas *fusca* was very scarce (ratio of one *fusca* to seventy-five *tingi*), and most of the specimens were males, which usually indicates that the height of the season has not yet been reached. This is supported by the fact that *fusca* was at the height of its seasonal abundance in May at Auburn and Sequoia National Park. *C. tingi* and *fuga* are here considered as being sympatric, even though they have not been collected, strictly speaking, in the same spot. Their distributional areas overlap in Napa and Sonoma counties where there are no evident distributional barriers, and they have the same host plant. The main morphological difference separating the two is in the size of the metathoracic wings; in *tingi* they are reduced in size and modified in shape (probably cannot fly), and no intermediate condition between the two species is known. There is little doubt

that *tingi* is a specialized branch of *fuga*. *C. tingi*, *fuga* and *fusca* are allopatric species in relation to their relatives *ampla* and *purshiae* but are very distinct morphologically; recognizable topographical and climatic barriers separate their distributions and their hosts are different. *C. purshiae* is an allopatric species in relation to *ampla*, occurring on the eastern side of the Sierra Nevada Mountains in California and in Nevada, and it is known only from Medford on the western side of the Cascades in Oregon. In California and Nevada its host plant is *Purshia tridentata*. *C. ampla* comes from the semi-arid inner coast ranges of Fresno and San Luis Obispo counties where it occurs sympatrically with *hageni* and *testacea* except that its host plant is *Juniperus californicus*. Several morphological characters separate *ampla* and *purshiae* adequately for specific recognition.

*C. hageni* is allopatric in its relationship with *acuta*, occurring in Fresno County, sympatrically with *ampla*, on *Eriogonum fasciculatum*; whereas *acuta* occurs in Riverside County on *Adenostoma sparsifolium*. These two species are distinct morphologically, but the differences are less than those separating these species from *fulva*. *C. fulva* is allopatric in its relationships with *hageni* and *acuta*, sympatric with *clypeata* occurring only on Santa Catalina Island. *C. clypeata* is sympatric in its relationship with *fulva*, from which it differs greatly in a number of morphological characters, but is allopatric in relation to its more closely allied mainland relatives, which are, however, distinct morphologically. *C. parvula* is allopatric in relation to its nearest allies but occurs sympatrically with *testacea* in Los Angeles and Orange counties. It is abundantly distinct from all other known species and has greatly reduced metathoracic wings. *C. scotti* is allopatric in relation to other members of this group but occurs sympatrically with *fusca* in Tulare County. It is, however, quite distinct morphologically, being perhaps most easily confused with *rubida* and *utahensis*. *C. rubida* is allopatric in relation to all other species, including *scotti* which seems to be

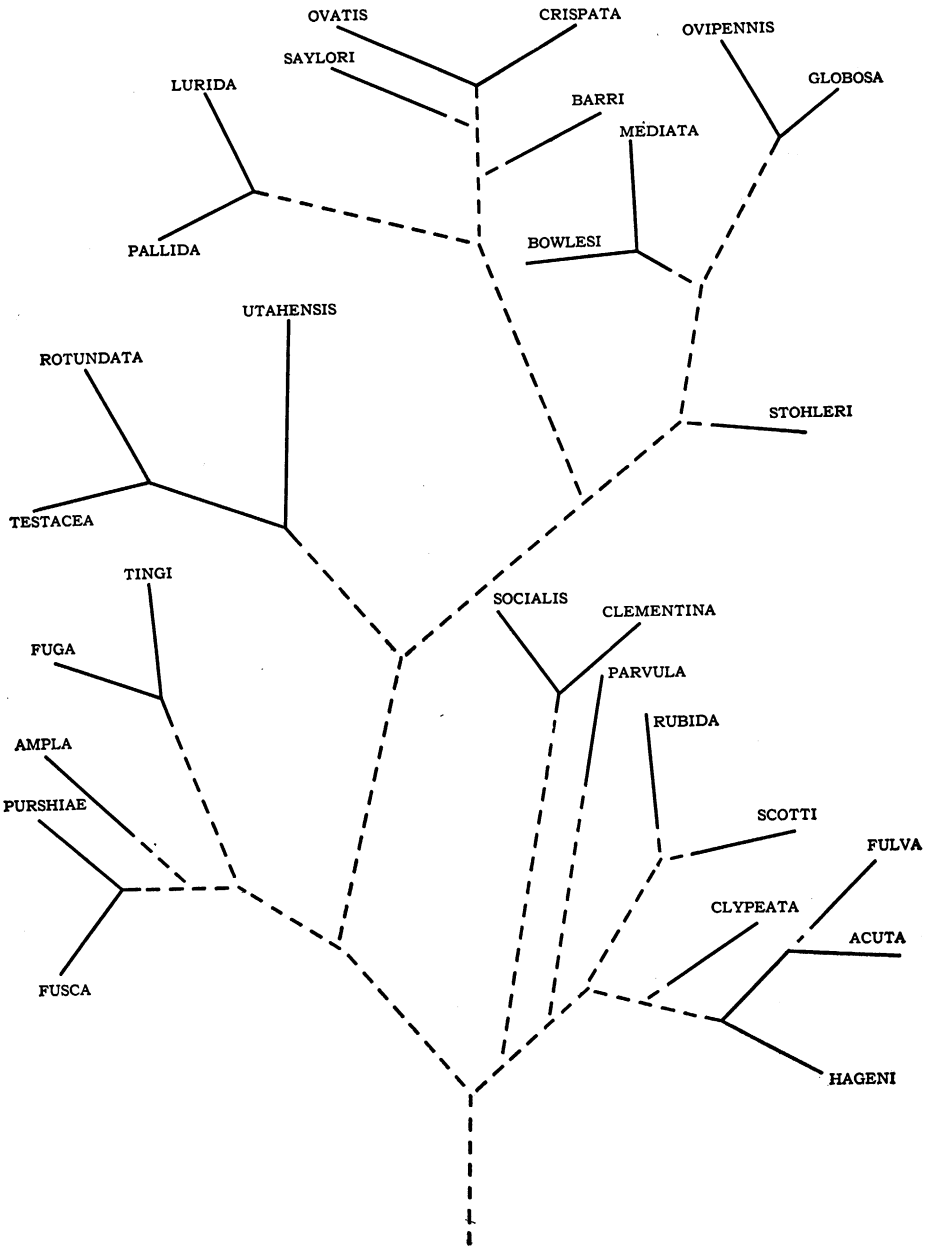


Fig. 2. Phylogenetic relationships of the species of *Coenonychia*.

its nearest but morphologically distinct relative. *C. clementina* is allopatric in its relationship with *socialis*, which is closely allied morphologically. However, in view of the morphological change involving the loss of an antennal segment, and the presence of sexual dimorphism in *socialis*, it is impossible at the moment to recognize them as subspecies. Both species are flightless, and a considerable distance separates Guadalupe Island from San Clemente Island.

In the *testacea* group the problems are somewhat more difficult and the conclusions more uncertain. *C. testacea*, *rotundata* and *utahensis* are allopatric but closely allied morphological species. *C. testacea* occurs sympatrically with *ampla* and *parvula* and possibly with *ovatis* and *barri*, which are within its range but have not been collected in any locality with it. Aside from being morphologically distinct, *ampla* and *barri* have different hosts, which in turn are different from those of *testacea*. No hosts are known for *parvula* and *ovatis*, but both of these species are very distinct and easily separable from *testacea*, especially in the development of the metathoracic wings. *C. utahensis* is, on the other hand, closely allied morphologically with *testacea* and may eventually prove to be a subspecies. The remainder of the species in this group are allopatric with varying degrees of morphological distinctness. *C. globosa*, *stohleri*, *ovipennis*, *pallida*, *lurida* and *mediata* all appear to be distinctly separable morphologically at the present time and cannot therefore

be regarded as subspecies even though they are allopatric. On the other hand, *barri*, *saylori*, *crispata* and *ovatis* might prove to be subspecies, as they are allopatric in a relatively small and rather uniform area. In wing development, *barri*, which has fully developed metathoracic wings, might conceivably have given rise to *crispata* and *saylori* in which the wings are partially reduced; and *crispata* might in turn have given rise to *ovatis* in which they are greatly reduced. However, these wing characters are not continuously variable among the species, and additional characters on the clypeus and pronotum support these wing differences so that for the present these populations are recognized as being allopatric species.

There are therefore at least seven and possibly nine sympatric species associations known in the genus at the present time. Of the allopatric species only two are known from more than one locality, thus indicating the possibility of future change in status as more information becomes available on their distributions and behavior in adjacent and identical areas. Four species are insular in distribution, two being sympatric, possibly as a result of re-invasion, and two allopatric with their flightless condition and the intervening water barrier allowing them to undergo independent evolution. All the species occupying the more desert regions are allopatric, and considerable distances (not necessarily barriers) generally separate their distributions.

#### TAXONOMIC CHARACTERS

The following characters are the most valuable in the present classification of the genus and appear to have undergone a number of different types of modification among the various species.

**LABRUM.**—There appears to be little or no difference in the shape of this character throughout the genus, but in several species there are differences in its sculpturing. These differences consist either of a condition in which the surface is covered with well-spaced punctures or one in which the

punctures are small and close together, giving a granular appearance.

**CLYPEUS.**—This is one of the most variable and complexly modified characters undergoing divergent evolution in the genus. The anterior margin may be broad or constricted, the reflexed edge may be wide or narrow, the anterior edge may be straight, emarginate or bidentate, and the angles either evenly rounded, or obtusely or acutely angulate. The lateral margins are either widely or narrowly

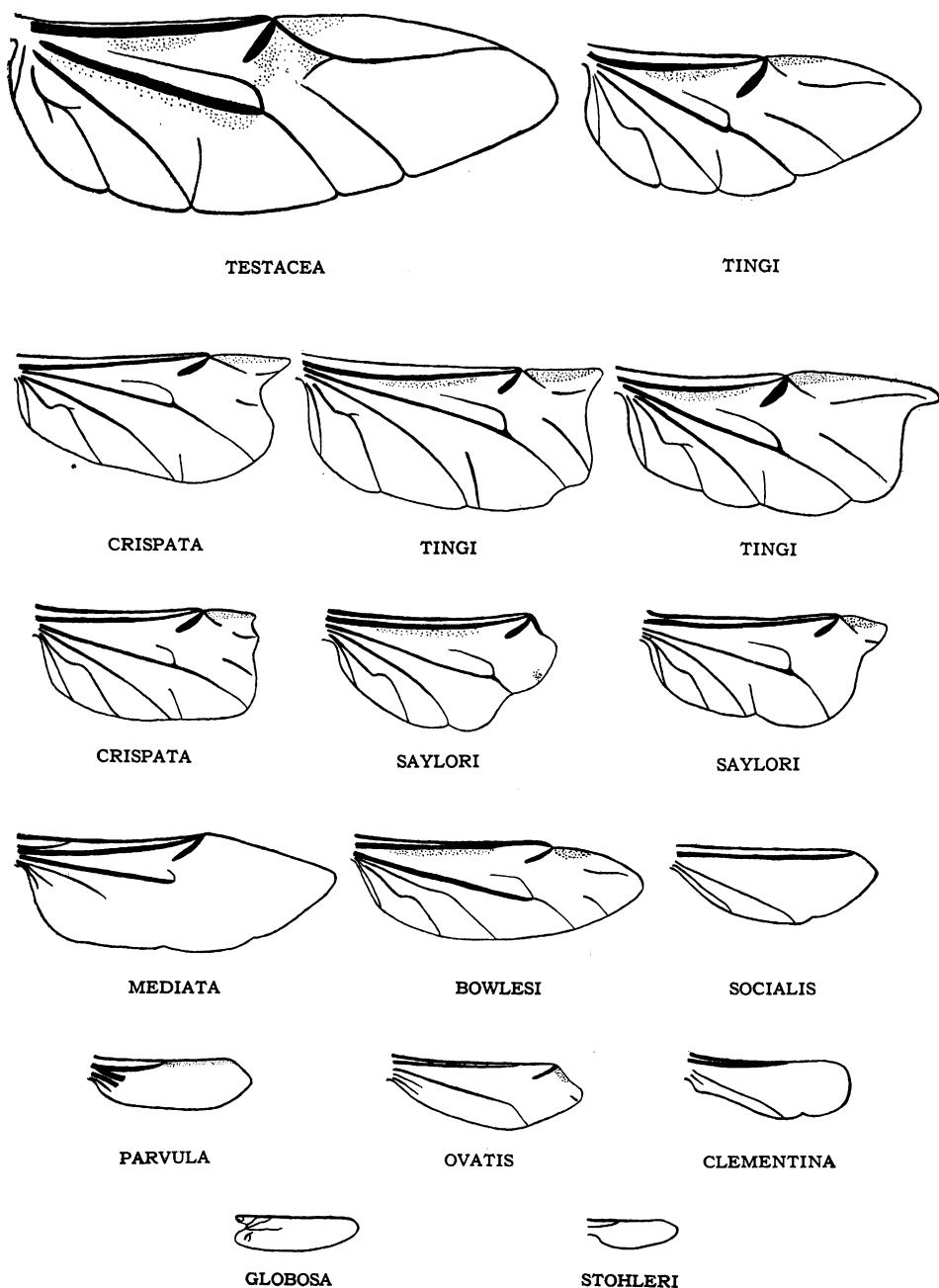


Fig. 3. Metathoracic wings of certain species of *Coenonycha*.



reflexed and are angulate or straight at the insertion on the head. The surface may be sparsely or cribrately punctate, and the proportional relationship between length and width varies. The clypeal suture may be evident or obscure medially, and it may also be straight, shallowly or deeply emarginate medially.

ANTENNAE.—In past classifications, the segmentation of this structure has received considerable prominence. However, in series of *testacea* and *tingi* the antennae were found to vary from seven to ten segments, those on the two sides of the same individual often being different. The usual and maximum number is ten segments, but as far as known the female of *socialis* has only nine segments and the female of *ovipennis* eight. Additional specimens of these two species will probably show that they are as variable as *tingi* and *testacea*, as the fusion of the segments involved in this reduction is not complete and traces of the missing segments are often evident.

PRONOTUM.—The side margins undergo considerable divergence between species in the angulation of the anterior angles and of the side margins. The punctuation of the disk is also of great value, as regards both the placement and the size of the punctures.

SCUTELLUM.—In some species that have undergone wing reduction there is also a modification in the shape of the scutellum, that is, in the relationship between its length and breadth, and in the shape of the side margins.

ELYTRA.—These are of considerable importance, as they are greatly modified in species with reduced wings and have the advantage of being readily accessible for examination. The size of the humeral umbone is a fairly accurate indicator of the extent of the metathoracic wing reduction. The reduction in the size of the umbone and the narrowing at the base give the elytra a subglobular appearance, which indicates that changes in the metathoracic wing have taken place. The punctuation of the elytral disk is also of some use in separating populations.

METATHORACIC WINGS.—One of the most interesting as well as fundamental

characters undergoing evolutionary change in the genus is the reduction of the metathoracic wings (Fig. 3). In the known species there appear to be two distinct types of wing reduction: one involving the over-all reduction in the size of the wing with the eventual loss of many veins, and the other progressing through a series of definite cuts or notches in the wing apex. This latter process, which eventually reduces the wing to a mere vestige, appears to be somewhat analogous to certain mutant wing anomalies found in *Drosophila* (truncate, notched, etc.) and appear to follow a pattern of reduction similar to those found in that genus. In *tingi* some specimens have the wing well developed except that it is greatly reduced in size, while other specimens show a gradual transition in the extent of the apical cut, as shown. This same type of gradual reduction is evident in *crispata* and *saylori*, but the normal wing is not present in either of these species. *C. mediata* has also undergone considerable reduction in wing size, and most of the veins that usually extend to the margin are lost. In contrast with this species, *bowlesi* has the wing reduced in size, but most of the veins are still evident. *C. parvula*, *socialis* and *ovatis* appear to be the most advanced stage in the cut type of reduction, whereas *stohleri*, *globosa* and *clementina*, although questionable, might be the most advanced stage in the gradual over-all reduction. Additional species or populations will probably show many of the transitional steps between the stages shown in this paper.

METASTERNUM.—This character may be used as are the elytral shape and humeral umbone in detecting the reduction of the metathoracic wings. As the wings become reduced this sclerite also reduces in size, especially in length. Its length used in relation to the width of the hind coxal plates (which are relatively uniform in width throughout the genus) forms an excellent character for differentiating the highly specialized and more generalized members of the genus.

GENITALIA.—Unfortunately little aid in classification can be obtained by using

these structures. The differences, when present, are very slight even between very distinct sympatric species, and even then the individual variation is sufficiently great to render the genitalia practically useless for classification purposes.

**PILOSITY.**—The amount of pile present on certain structures is a feature of considerable value in segregating groups of allied species, even though there is considerable variation, and mechanical injury sometimes makes it difficult to interpret. It can, however, be used advantageously

in conjunction with differences in color and structure of clypeus, pronotum and elytra.

**COLOR.**—Color may be used in the general segregation of the testaceous species from the brown or piceous ones, and the mottled from the unmottled testaceous populations. Care must be used, however, as there is considerable individual variation, especially in the darker species, and the age of the specimen often influences its color. *C. stohleri* can, however, be separated from all other species by its black color.

#### KEY TO THE SPECIES OF *Coenonycha*

1. Metathoracic wings fully developed; metasternum, at narrowest point between middle and hind coxae, distinctly longer than the width of the hind coxal plates ..... 12.  
Metathoracic wings reduced in size and shape; metasternum, at narrowest point between middle and hind coxae, shorter than or subequal to the width of the hind coxal plates ..... 2.
2. Head and pronotum densely pilose throughout ..... *parvula*.  
Head and pronotum glabrous or very sparsely pilose laterally ..... 3.
3. Elytra with surface between punctures alutaceous throughout, opaque ..... 4.  
Elytra with surface between punctures (if evident) smooth, shining or with only the depressed areas faintly alutaceous ..... 5.
4. Pronotum with side margins markedly sinuate before apex; females larger in size than males and with nine-segmented antennae; Guadalupe Island ..... *socialis*.  
Pronotum with side margins straight or scarcely sinuate before apex; females equal in size to males and with ten-segmented antennae; San Clemente Island ..... *clementina*.
5. (3) Scutellum broader than long, side margins subparallel to apical third, apical margin evenly rounded, not pointed ..... *globosa*.  
Scutellum longer than broad, side margins evenly rounded to the bluntly pointed apex ..... 6.
6. Elytra with punctures obscure, disk with rugose area; color black ..... *stohleri*.  
Elytra with punctures distinct, disk without rugose area; color testaceous or dark brown ..... 7.
7. Anterior clypeal angles dentate; side margins of pronotum subangulate medially, rather strongly converging anteriorly ..... 8.  
Anterior clypeal angles evenly rounded; side margins of pronotum evenly, obtusely rounded, not strongly converging anteriorly ..... 10.
8. Metathoracic wings without expanded anal membrane, anal veins represented only as basal vestiges (Fig. 3); elytra subovate ..... *ovatis*.  
Metathoracic wings with expanded anal membrane, anal veins represented by well-developed 2dA and 3dA (Fig. 3); elytra elongate ..... 9.
9. Pronotum with punctures large, separated by about their own widths on the disk; color dark brown ..... *tingi*.  
Pronotum with punctures small, separated by about twice their own widths on the disk; color testaceous ..... *crispata*.

10. (7) Elytra moderately pilose; metathoracic wings reduced to narrow vestiges, lacking anal area.....*ovipennis*.<sup>1</sup>
- Elytra sparsely pilose; metathoracic wings reduced but with a distinct anal area which has two or three veins.....11.
11. Metathoracic wings with apical portion of remigium reduced abruptly and transversely at or slightly beyond stigmal area; basal portions of either  $R_3$  or  $M_1$  evident (Fig. 3); clypeal suture distinct throughout; elytra subovate.....*saylari*.
- Metathoracic wings with apical portion of remigium normal in shape but reduced in size, not abruptly and transversely cut;  $R_3$  and  $M_1$  not present (Fig. 3); clypeal suture obscured medially by dense deep punctation; elytra elongate.....*mediata*.
12. (1) Anterior clypeal margin more widely reflexed than side margins, edge of anterior margin not continuing on the same level as edge of side margins, abruptly elevated at angles.....16.
- Anterior reflexed clypeal margin equal in width to or less than width of side clypeal margins, edge of anterior margin continuing on same level as edge of side margins or depressed below level of side margins, at most, slightly elevated at angles.....13.
13. Front of head, clypeus and entire dorsal pronotal surface pilose.....*clypeata*.
- Front of head, clypeus and dorsal pronotal surface subglabrous, pile confined to lateral portions when present.....14.
14. Pronotum with discal punctures large, separated by about twice their own widths; anterior pronotal angles sharply produced forward; elytra clothed with long erect hair.....*rubida*.
- Pronotum with discal punctures small, separated by about three to four times their own widths; anterior pronotal angles not produced forward; elytra glabrous or clothed with short, recumbent hair.....15.
15. Anterior clypeal margin deeply emarginate medially; color usually dark brown to piceous.....*fusca*.
- Anterior clypeal margin not emarginate medially; color dark testaceous.....*utahensis*.
16. (12) Dorsal surface entirely or in greater part testaceous (generally pale testaceous).....17.
- Dorsal surface entirely or in greater part reddish brown to piceous.....22.
17. Upper surface uniformly pale testaceous.....18.
- Upper surface with piceous areas interspersed.....20.
18. Clypeal suture obscured medially by dense punctation; side pronotal margins obtusely angulate medially.....*bowlesi*.
- Clypeal suture distinct; side pronotal margins obtusely rounded, not angulate as above.....19.
19. Pronotum with side margins straight behind middle, narrowly converging to base; elytral costae usually obscure; elytra proportionally long.....*lurida*.
- Pronotum with side margins evenly rounded behind middle; elytral costae usually well defined; elytra not unusually long.....*pallida*.
20. (17) Anterior third of clypeal surface (exclusive of reflexed portion) smooth or alutaceous, punctate but not rugose.....21.
- Anterior third of clypeal surface rugose at middle.....*testacea*.
21. Elytral costae absent; anterior third of clypeal surface (exclusive of reflexed portion) punctate and generally alutaceous.....*barri*.
- Elytral costae present; anterior third of clypeal surface (exclusive of reflexed portion) smooth, shining.....*rotundata*.
22. (16) Elytra rather densely clothed with long pile.....23.
- Elytra sparsely clothed with short pile.....26.
23. Anterior pronotal margin abruptly angulate forward at about lateral third.....*acuta*.

<sup>1</sup> The placement of this species is made only with the aid of notes made on the type in 1938 and with the original description. It is apparently known only from the single type specimen.

- Anterior pronotal margin evenly rounded laterally, angles not greatly produced forward.....24.
24. Pronotum with side margins obtusely angulate at middle; pronotum and elytra dark brown.....25.
- Pronotum with side margins evenly rounded at middle; light reddish brown throughout.....*fulva*.
25. Clypeus strongly constricted anteriorly; pronotum with discal punctures separated by about their own widths.....*scotti*.
- Clypeus only slightly constricted anteriorly; pronotum with discal punctures separated by twice or more than twice their own widths.....*hageni*.
26. (22) Color light reddish brown.....28.
- Color dark brown.....27.
27. Clypeus about one-third wider than long; labrum punctate, not granulate; medium sized, 6.0 to 8.5 mm. long; host *Adenostoma fasciculatum*.....*fuga*.
- Clypeus about one-half wider than long; labrum punctate and granulate; large in size, 9.0 to 12.0 mm. long; host *Juniperus californicus*.....*ampla*.
28. (26) Clypeal suture rather deeply emarginate and evident medially.....*purshiae*.
- Clypeal suture shallowly emarginate and obscure medially.....*fulva*.

## DESCRIPTION OF SPECIES

**Coenonycha fuga** Cazier, new species

Medium sized, narrow; uniformly piceous throughout; metathoracic wings fully developed.

**MALE.**—*Head* with impunctate area on vertex; front densely punctate, punctures separated by about one-fourth their own widths above, coalescent below; clypeus with side margins narrowly reflexed, anterior margin widely reflexed and shallowly bisinuate, angles scarcely dentiform, surface rugosely granulate, clypeal suture deeply arcuately emarginate toward base at middle; antennae ten-segmented. *Pronotum* widest at middle; side margins evenly obtusely rounded to base, straight and gradually convergent anteriorly; anterior angles acute, not sharply produced; surface smooth, shining, punctures small, sparse, separated by about two to three times their own widths on the disk. *Elytra* with side margins subparallel; humeral umbones prominent; costae evident; surface with minute alutaceous sculpturing, punctures large, irregularly placed, separated on disk by about their own widths, each puncture giving rise to a short pale hair. *Venter* sparsely pilose, punctures small and sparsely placed; metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.4 mm.; width, 3.9 mm.

**FEMALE.**—Similar to male but more robust and with the pronotal punctures slightly larger. Length, 8.8 mm.; width, 4.0 mm.

**TYPE MATERIAL.**—Holotype male and allotype female in the collection of The American Museum of Natural History, taken in Oakland Hills, Alameda County, California, March 3, 1940, by R. G. Dahl.

The types and paratopotypic series were taken at night on *Adenostoma fasciculatum* H. and A. Two hundred and fifty paratopotypes collected by W. F. Barr, K. S. Hagen and R. G. Dahl are deposited in their collections and in those of A. T. McClay, David Rockefeller, L. W. Saylor, O. L. Cartwright and The American Museum of Natural History. Six paratypes taken on Mt. Diablo, Contra Costa County, California, April 4, 1937, by B. E. White and M. A. Cazier, are in the collections of A. T. McClay and The American Museum of Natural History. Seven paratypes from Mt. Diablo, Contra Costa County, California, May 8, 1934 (L. W. Saylor), are deposited in the collections of L. W. Saylor and The American Museum of Natural History. Two paratypes from Mt. St. Helena, Napa County, California, April 11, 1940 (E. C. Johnston), are deposited in the collections of Ernest Shoemaker and The American Museum of Natural History.

This species appears to be most closely allied to *C. tingi* but can be distinguished by its smaller and less densely placed pronotal punctures and by its fully developed metathoracic wings. From *C. ampla* it is separable by its elongate clypeus, ungranulate labrum and by its smaller size.

**Coenonycha tingi** Cazier

*Coenonycha tingi* CAZIER, 1937, Bull. So. Calif. Acad. Sci., XXXVI, pp. 126-127.

Medium sized, short, robust; dark brown to piceous; metathoracic wings reduced, remigium of normal shape or reduced by transverse cuts (Fig. 3).

MALE.—*Head* with small area on vertex impunctate; front densely punctate, punctures separated by about one-fifth their own widths above, cribrate and coalescent below; clypeus with side margins prominently reflexed, anterior margin more widely reflexed, shallowly bisinuate, anterior angles markedly dentiform, surface shallowly cribrately punctate, clypeal suture feebly emarginate medially; antennae ten-segmented. *Pronotum* widest at middle; side margins subangulate medially, evenly rounded behind, shallowly sinuate and gradually convergent anteriorly; anterior angles prominently produced forward; surface smooth, shining, punctures large, dense, separated by about their own widths on disk, each puncture giving rise to a short pale hair. *Elytra* widest at apical third, side margins evenly rounded; humeral umbones reduced but prominent; costae scarcely evident; surface with minute alutaceous sculpturing in depressions, punctures irregular, separated by about their own widths, each puncture giving rise to a short pale hair. *Venter* sparsely pilose and punctate; metasternum at narrowest point between coxae barely longer than or equal to the width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 7.5 mm.; width, 3.5 mm.

FEMALE.—Similar to the male but slightly larger and more robust. Length, 9.2 mm.; width, 4.1 mm.

TYPE LOCALITY.—Napa, Napa County, California, March 30, 1937 (H. B. Leech, M. A. Cazier). Specimens were collected on *Adenostoma fasciculatum* H. and A. at night. The first adult specimen and larvae were taken at the type locality during the day on the roots of the above-mentioned plant by P. C. Ting.

The only other known locality for this species is Eldridge, Sonoma County, California, March 28, 1915 (J. A. Kusche).

This species is most closely related to *C. fuga* but can be distinguished from that species by its more densely punctate pronotum and reduced metathoracic wings. From *C. rotundata* it differs in its wider, differently shaped and more densely punctate pronotum, and reduced metathoracic wings.

**Coenonycha purshiae** Cazier, new species

Medium sized; head and pronotum light reddish brown; elytra, undersurface and legs testaceous; metathoracic wings fully developed.

MALE.—*Head* with vertex partially smooth; front irregularly, shallowly punctate, punctures coalescent below, separated by about one-third their own widths above; clypeus with side margins shallowly reflexed, front margin prominently reflexed, angles dentiform, front margin sinuate medially, surface with large shallow punctures coalescent, centers of pits visible, clypeal suture visible throughout, strongly curved toward base medially; antennae ten-segmented, club not so long as the six funicular segments combined; maxillary palpi with terminal segment as long as last antennal segment. *Pronotum* sparsely clothed with short yellow pile; narrower than elytra; widest at middle; sides evenly rounded to base, obtusely angulate medially, narrowly constricted anteriorly, anterior angles acute; surface shining, punctures small, separated on disk by about their own widths, more dense laterally, median longitudinal impression faintly indicated. *Elytra* sparsely clothed with short yellow pile; sides subparallel, scarcely wider at apical third; humeral umbones prominent, impunctate; surface with costae only faintly indicated, not elevated, intercostal areas of disk with punctures separated by about twice their own widths. *Venter* sparsely clothed with short yellow pile; metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.5 mm.; width, 3.9 mm.

FEMALE.—Similar to the male but more robust; front margin of clypeus less deeply sinuate; front angles of pronotum not so acute or produced; pronotal surface less densely punctate, punctures separated by about twice their own widths; elytra with costae somewhat elevated. Length, 9.0 mm.; width, 4.3 mm.

TYPE MATERIAL.—Holotype male and allotype female in the collection of The American Museum of Natural History, taken at Cedarville, Modoc County, California, May 30, 1939, by P. C. Ting, J. A. Downes, T. H. G. Aitken and M. A. Cazier. All specimens were collected by beating *Purshia tridentata* D. C. at night. Ten paratopotypes are in the collection of

The American Museum of Natural History. Seventy designated paratypes collected at Gardnerville, Douglas County, Nevada, May 28, 1939, by the same collectors as above are deposited in the collections of A. T. McClay, David Rockefeller, O. L. Cartwright, L. W. Saylor, M. W. Sanderson, United States National Museum, California Academy of Sciences and The American Museum of Natural History.

Additional specimens studied came from The Dalles, Wasco County, Oregon, April 28, 1926; Medford, Jackson County, Oregon, April 7, 1933; Kamiak Mountain, Washington, April 13-19, 1935 (I. W. Bales); Yakima, Yakima County, Washington, May 15, 1931 (A. R. Rolfs); Pullman, Whitman County, Washington, April 13, 1899 (C. V. Piper); Reno, Washoe County, Nevada, January, 1940 (Ira La Rivers); Horse Camp, Modoc County, California, July 1, 1934 (J. T. Howell); Gowmeiz, Lassen County, California, May, 1916 (H. C. Muzzall).

This fully winged species can be distinguished from *C. fuga* by the less reflexed side clypeal margins, the more deeply sinuate anterior clypeal margin, smaller pronotal punctures, lighter color and larger size. From *C. testacea* it can be distinguished by its larger size, darker color, shallowly reflexed side clypeal margins, by its dentiform front clypeal angles and by the more prominent posterior medial emargination of the clypeal suture. *C. purshiae* can be distinguished from *C. rotundata* by the larger and more densely placed pronotal punctures, more obtusely angulate side pronotal margins, by its larger size, darker color and by its shallowly reflexed side clypeal margins. It is probably most closely allied to *C. fusca* from which it can be distinguished by its angulate clypeal angles, produced anterior pronotal angles and larger size.

**Coenonycha ampla** Cazier, new species

Large, robust; uniformly dark brown throughout; sparsely pilose throughout; metathoracic wings fully developed.

MALE.—Head with smooth area on vertex; front with large punctures separated by about one-half their own widths above, nearly coalescent below; clypeus with side margins strongly

reflexed, anterior margin more widely reflexed, anterior angles scarcely dentiform, anterior margin shallowly sinuate, surface with large punctures coalescent, clypeal suture prominent, obtusely sinuate posteriorly at middle; antennae ten-segmented, club as long as six funicular segments combined. Pronotum widest at middle; sides evenly arcuately rounded behind, shallowly sinuate and gradually converging in front; anterior angles acute, prominent; surface sparsely clothed with short brownish pile, punctures small, sparse, separated on disk by about twice their own widths, more dense laterally. Elytra with side margins subparallel, abruptly rounded apically; humeral umbones prominent; surface minutely alutaceous, costae evident, irregular punctures on disk separated by about their own widths, each puncture giving rise to a short brown hair. Venter sparsely clothed with short yellow pile; metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 10.1 mm.; width, 4.0 mm.

FEMALE.—Similar to the male but differing by being more robust, less pilose, and by having the anterior pronotal angles at sides straight rather than sinuate. Length, 10.1 mm.; width, 4.9 mm.

TYPE MATERIAL.—Holotype male and allotype female in the collection of The American Museum of Natural History, taken at Coalinga, Fresno County, California, May 14, 1938, by J. J. duBois, K. L. Maehler and M. A. Cazier. All specimens were collected by beating *Juniperus californicus* Carr. at night. Fifteen paratopotypes are deposited in the collections of A. T. McClay, David Rockefeller, L. W. Saylor, O. L. Cartwright, M. W. Sanderson, California Academy of Sciences and The American Museum of Natural History. Two hundred and thirty-six paratopotypes collected by R. G. Dahl, K. S. Hagen, E. Hagen and W. F. Barr deposited in their collections and in those of A. T. McClay and The American Museum of Natural History. One paratype from Wartham Canyon, Fresno County, California, April 2, 1938 (J. E. Blum) in Mr. Blum's collection. Twelve paratypes from Simmler, San Luis Obispo County, California, March 22, 1940 (J. W. Tilden, G. S. Mansfield) in the collections of J. W. Tilden and The American Museum of Natural History.

This species appears to be most closely allied to *C. purshiae* but can be readily

distinguished by its larger size, more abruptly reflexed side clypeal margins, less densely punctate pronotum and by the alutaceous elytral sculpturing. From *C. tingi* it can be distinguished by its large size, by the sparse pronotal punctation and by the granulate labrum.

**Coenonycha hageni** Cazier, new species

Medium sized; pronotum and elytra piceous; front of head, clypeus and undersurface testaceous; rather densely pilose throughout; metathoracic wings fully developed.

**MALE.**—*Head* with small smooth area on vertex; front densely punctate, punctures separated by about one-third their own widths above, below coalescent and irregular; clypeus with side margins prominently reflexed, front margin much more widely reflexed, shallowly sinuate medially, angles obtusely dentiform, surface with punctures coalescent, only faintly indicated, clypeal suture posteriorly emarginate medially; antennae ten-segmented, club almost as long as six funicular segments combined. *Pronotum* widest at middle; side margins evenly obtusely rounded at base, gradually converging to apex; anterior angles acute; surface clothed with rather long yellowish pile, punctures on disk separated by about one and one-half times their own widths, more dense laterally. *Elytra* shining; side margins subparallel; humeral umbones prominent; surface with costae faint, rather densely clothed with long yellowish pile, punctures on disk separated by about their own widths. *Venter* moderately pilose, metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 9.0 mm.; width, 3.8 mm.

**FEMALE.**—Similar to the male but with front margin of clypeus not so widely reflexed, pronotum more convex and the pronotal punctures larger. Length, 9.0 mm.; width, 4.0 mm.

**TYPE MATERIAL.**—Holotype male and allotype female in the collection of The American Museum of Natural History, taken at Coalinga, Fresno County, California, May 14, 1938 (J. J. duBois, K. L. Maehler, M. A. Cazier). All specimens were collected at night on *Eriogonum fasciculatum* Benth. Twenty-two designated paratopotypes deposited in the collections of A. T. McClay, David Rockefeller, O. L. Cartwright, L. W. Saylor, M. W. Sanderson, California Academy of Sciences and The American Museum of Natural History. One hundred and six paratopotypes collected by R. G. Dahl, K. S. Hagen, E. Hagen and W. F. Barr

deposited in their collections and in those of A. T. McClay and The American Museum of Natural History.

The describer is pleased to name this species in honor of K. S. Hagen who contributed many of the specimens used for study.

*C. hageni* appears to be most closely related to *acuta* but can be distinguished by its longer elytral pile, less acutely produced anterior clypeal and pronotal angles and by its more deeply emarginate clypeal suture. From *C. fulva* it can be separated by its larger size, darker color, more densely punctate head and less acutely produced anterior pronotal angles.

**Coenonycha acuta** Cazier, new species

Medium sized; elytra piceous; pronotum, head and undersurface reddish brown; moderately clothed throughout with long yellowish pile; metathoracic wings fully developed.

**MALE.**—*Head* with small smooth area on vertex; front densely punctate, punctures separated above by about one-fourth their own widths, coalescent below; clypeus with side margins prominently reflexed, anterior margin more strongly reflexed, shallowly sinuate, anterior angles acutely dentiform, surface obscurely punctate, clypeal suture evident throughout, shallowly emarginate medially. *Pronotum* widest at middle; side margins evenly rounded to base, converging anteriorly, shallowly emarginate; anterior angles acute, prolonged forward; surface with punctures on disk separated by about twice their own widths. *Elytra* with side margins subparallel, abruptly rounded to apex; humeral umbones prominent; surface with costae faintly evident, punctures on disk separated by about their own widths. *Venter* moderately pilose; metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.0 mm.; width, 3.8 mm.

**FEMALE.**—Unknown.

**TYPE MATERIAL.**—Holotype male in the collection of the California Academy of Sciences, taken at Pinon Flat, San Jacinto Mountains, Riverside County, California, May 27, 1939 (E. S. Ross). The type was collected on Ribbon Wood (*Adenostoma sparsifolium* Torr.) at night. One male paratopotype taken May 21, 1940, in the collection of The American Museum of Natural History.

This species is apparently most closely allied to *C. hageni* but can be distinguished from this species by its more abruptly

reflexed anterior clypeal margin, by the acute anterior angles of the clypeus and by the more acute and produced anterior pronotal angles.

### **Coenonycha parvula** Fall

*Coenonycha parvula* FALL, 1901, Trans. Amer. Ent. Soc., XXVII, p. 293.

Small, subovate; uniformly dark brown throughout; metathoracic wings reduced to small narrow vestiges (Fig. 3).

**MALE.**—*Head* with impunctate area on vertex; front densely punctate, punctures coalescent throughout, each puncture giving rise to a long testaceous hair; clypeus with side margins narrowly reflexed and constricted anteriorly, anterior margin widely reflexed, shallowly emarginate medially, anterior angles dentiform, surface cribrately punctate, each puncture giving rise to a long testaceous hair, clypeal suture obscured medially; antennae ten-segmented. *Pronotum* widest at middle; side margins evenly obtusely rounded to base, slightly sinuate apically; anterior angles acute, produced; surface smooth, densely punctate and pilose, punctures separated by about their own widths on the disk. *Elytra* subovate, side margins evenly rounded; humeral umbones reduced, scarcely evident; costae absent; surface with minute alutaceous sculpturing, punctures irregular, separated by about their own widths on disk, each puncture giving rise to a long erect testaceous hair. *Venter* sparsely pilose, punctation sparse; metasternum at narrowest point between coxae subequal in length to width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 6.8 mm.; width, 3.3 mm.

**FEMALE.**—Similar to male but somewhat larger and more robust. Length, 7.1 mm.; width, 3.8 mm.

**TYPE LOCALITY.**—Poway, San Diego County, California (F. E. Blaisdell). This species is also known from Pasadena, Los Angeles County, California, March 3, 1918 (J. O. Martin), and from the same locality by A. Fenyes.

This species resembles most closely *C. tingi* but can be distinguished by its longer pile, more reduced metathoracic

wings and more widely reflexed anterior clypeal margin. It is only distantly related to *C. rotundata*, which also occurs in San Diego County, and can be separated from that species by its reduced metathoracic wings, more widely reflexed clypeal margins, longer and more densely placed pile and by its large closely placed pronotal punctures.

### **Coenonycha socialis** Horn

*Coenonycha socialis* HORN, G., 1876, Trans. Amer. Ent. Soc., V, pp. 192–193; FALL, 1901, Trans. Amer. Ent. Soc., XXVII, p. 293; CASEY, 1909, Can. Ent., XXXI, p. 281.

Medium sized, subovate; uniformly dark reddish brown; metathoracic wings reduced to short and narrow vestiges (Fig. 3).

**MALE.**—*Head* with impunctate area on vertex; front densely punctate, punctures separated by about one-fifth their own widths above, coalescent below; clypeus with side margins prominently reflexed, anterior margin more widely reflexed, straight, angles dentiform, surface shallowly rugose and granulate, clypeal suture obscure medially; antennae ten-segmented. *Pronotum* widest at middle; side margins evenly rounded to base, deeply sinuate before apex; anterior angles acute, prominently produced; surface smooth, shining, punctures small, separated by about their own widths on disk. *Elytra* subovate with side margins evenly rounded; humeral umbones reduced but evident; costae evident; surface opaque, alutaceous sculpturing throughout, punctures small, separated by about three times their own diameters, each puncture giving rise to a short testaceous hair. *Venter* sparsely pilose, punctation sparse; metasternum at narrowest point between coxae subequal in length to width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 9.0 mm.; width, 4.5 mm.

**FEMALE.**—Similar to the male but much longer and more robust; antennae nine-segmented. Length, 11.5 mm.; width, 6.2 mm.

**TYPE LOCALITY.**—Guadalupe Island, Mexico (Edward Palmer).



This species is most closely allied to *C. clementina* from San Clemente Island but can be separated from it by its having the side pronotal margins markedly sinuate before the apex, and by the larger sized female which has nine-segmented antennae.

### **Coenonycha clementina** Casey

*Coenonycha clementina* CASEY, 1909, Can. Ent., XLI, p. 281.

Medium sized, subovate; uniformly dark reddish brown; metathoracic wings reduced to short and narrow vestiges (Fig. 3).

MALE.—Similar to the male of *C. socialis* Horn except for having the lateral pronotal margins less sinuate or straight. Length, 9.0 mm.; width, 4.5 mm.

FEMALE.—Similar to the female of *C. socialis* Horn except for its smaller size, ten-segmented antennae, more prominently dentate anterior clypeal angles and by its less sinuate or straight lateral pronotal margins. Length, 9.0 mm.; width, 4.5 mm.

TYPE LOCALITY.—San Clemente Island, California, May, 1939 (H. K. Raymenton).

This species is very closely allied to *C. socialis* and may prove to be conspecific with it when additional specimens are available for study. For comparison, see discussion given under *socialis*.

### **Coenonycha rotundata** (Le Conte)

*Dichelonyx rotundata* LE CONTE, 1856, Jour. Acad. Nat. Sci. Philadelphia, (2) III, p. 281.

*Coenonycha rotundata* (Le Conte), HORN, G., 1876, Trans. Amer. Ent. Soc., V, pp. 192–193; FALL, 1901, Trans. Amer. Ent. Soc., XXVII, p. 293; CAZIER, 1937, Bull. So. Calif. Acad. Sci., XXXVI, pp. 125–127.

Medium sized, narrow; dark reddish brown throughout; metathoracic wings fully developed.

MALE.—Head with a small impunctate area on vertex; front densely punctate, punctures separated above and below by about one-third their own widths; clypeus with side margins weakly reflexed, anterior margin more widely reflexed, angles not dentiform, anterior margin straight, surface cribrately punctate, clypeal suture evident throughout, shallowly arcuately emarginate toward base at middle; an-

tennae ten-segmented. Pronotum narrow, widest at middle; side margins evenly rounded to base, obtusely angulate medially, shallowly sinuate and convergent anteriorly; anterior angles acute, not greatly produced; surface smooth, shining, punctures small, sparse, separated by about one and one-half to twice their own widths on the disk, each puncture giving rise to a short yellowish hair. Elytra with side margins subparallel; humeral umbones prominent; costae only faintly evident; surface without alutaceous sculpturing in depressions, punctures irregular, separated by about their own widths on disk, each puncture giving rise to a short pale hair. Venter sparsely pilose, punctuation sparse, each puncture very small; metasternum at narrowest point between coxae distinctly longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.0 mm.; width, 3.5 mm.

FEMALE.—Similar to male but more robust. Length, 8.0 mm.; width, 3.7 mm.

TYPE LOCALITY.—Vallecitas, San Diego County, California (female). Male from Coronado, San Diego County, California, collected by H. C. Fall.

This species is somewhat like *C. clypeata* but can be distinguished from that species by its having the anterior clypeal margin more widely reflexed than the lateral margins, by its distinct clypeal suture, obtusely angulate side pronotal margins and smaller sized female. From *C. fulva* it can be distinguished by its less reflexed anterior clypeal margin, larger head punctures, subangulate lateral pronotal margins and darker color. It appears to be most closely allied to *C. testacea* from which it can be separated by its more acutely produced clypeal angles, smaller size, darker color and smoother clypeal surface.

### **Coenonycha testacea** Cazier

*Coenonycha testacea* CAZIER, 1939, Bull. So. Calif. Acad. Sci., XXXVI, pp. 127–128.

Medium sized, narrow; head and pronotum light yellowish brown, elytra testaceous except for suture which in some specimens is piceous or brown; metathoracic wings well developed (Fig. 3).

**MALE.**—*Head* with impunctate area on vertex; front densely punctate, punctures separated above by about one-third their own widths, coalescent below; clypeus with side margins moderately reflexed, anterior margin more widely reflexed, shallowly emarginate medially, anterior angles prominent but not dentiform, surface rugosely punctate, clypeal suture evident throughout, shallowly arcuately emarginate medially; antennae ten-segmented. *Pronotum* widest at middle; side margins evenly rounded behind, slightly angulate medially, straight and gradually convergent anteriorly; anterior angles acute, not greatly produced; surface smooth, shining, glabrous, punctures small, sparse, separated by from two to three times their own widths on the disk. *Elytra* with side margins subparallel; humeral umbones prominent; costae not evident; surface without alutaceous sculpturing in depressions, punctures irregular, separated by about twice their own widths, each puncture giving rise to a short pale hair. *Venter* sparsely pilose, punctation sparse; metasternum at narrowest point between coxae distinctly longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.0 mm.; width, 3.0 mm.

**FEMALE.**—Similar to male but slightly larger and more robust. Length, 9.0 mm.; width, 4.0 mm.

**TYPE LOCALITY.**—Clear Creek, Cuyama Canyon, Santa Barbara County, California, March 7, 1937 (E. S. Ross, H. B. Leech, M. A. Cazier). All specimens were collected on *Eriogonum fasciculatum* Benth. at night.

This species is now known from localities in Monterey, San Luis Obispo, Santa Barbara, Kern, San Bernardino and Orange counties, California. Specimens of this species were collected three miles east of Isabella, Kern County, California, April 2, 1942 (W. F. Barr, W. E. Ferguson) on *Chrysothamnus nauseosus*.

*Coenonycha testacea* is most generally confused with *C. rotundata* but can easily be separated by its testaceous color and the rugose clypeal surface. It can be separated from *C. barri* by its less dentate

clypeal angles, rugose clypeal surface, more shallowly emarginate clypeal suture and emarginate anterior clypeal margin.

### ***Coenonycha pallida* Cazier, new species**

Medium sized, narrow; uniformly pale yellow throughout; metathoracic wings fully developed.

**MALE.**—*Head* with vertex impunctate; front densely punctate, punctures separated by about one-third their own widths above, coalescent below; clypeus with side margins prominently reflexed, anterior margin more widely reflexed, angles scarcely dentiform, anterior margin nearly straight, surface with punctation obscure, clypeal suture shallowly arcuately emarginate toward base at middle; antennae ten-segmented (club lacking). *Pronotum* widest at middle; side margins evenly obtusely rounded to base, straight and gradually convergent anteriorly; anterior angles obtuse, not sharply produced; surface smooth, glabrous, shining, punctures small, sparse, separated by about three times their own widths on the disk. *Elytra* with side margins subparallel; humeral umbones prominent; costae evident; surface with minute alutaceous sculpturing, punctures irregular, separated by about their own widths, each puncture giving rise to a short pale hair. *Venter* sparsely pilose, punctation sparse, each puncture very small; metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.5 mm.; width, 3.8 mm.

**FEMALE.**—Similar to male but more robust, clypeal margins not so abruptly reflexed and the punctation more dense. Length, 10.1 mm.; width, 4.8 mm.

**TYPE MATERIAL.**—Holotype male taken at Baker, San Bernardino County, California, March 27, 1935 (M. A. Cazier), and allotype female taken at same locality, April 30, 1937 (M. A. Cazier) in the collection of The American Museum of Natural History. Two designated paratopotypes, one each in the collections of L. W. Saylor and A. T. McClay. Two paratypes from Inyokern, Kern County, California, March 14, 1941 (T. H. G. Aitken) in The American Museum of Natural History. The holotype and two paratypes were collected at lights at night. The allotype was collected by beating *Artemisia* sp. at night.

This species can be distinguished from the preceding fully winged species by its uniform pale yellow color and sparse punctation. *C. pallida* is apparently most closely allied to *C. lurida* but can be distinguished by its more prominent front clypeal margin, by its more strongly

emarginate clypeal suture, by its less angulate side pronotal margins, by the more prominent elytral costae and by its proportionately much shorter elytra. From *C. bowlesi* it is distinguishable by its more sharply and broadly reflexed clypeal margins, by its less angulate pronotal side margins, by its larger size and more elongate shape.

#### **Coenonycha lurida** Cazier, new species

Medium sized, elongate, narrow; uniformly pale yellow throughout; metathoracic wings fully developed.

**MALE.**—*Head* with smooth area on vertex; front densely punctate, punctures above separated by about one-fourth their own widths, below coalescent; clypeus with side margins narrowly reflexed, front margin more widely reflexed, anterior angles evenly rounded, not dentate, front margin not sinuate, surface with punctures confused, clypeal suture deep, shallowly emarginate medially; antennae ten-segmented, club as long as six funicular segments combined. *Pronotum* widest at middle, side margins obtusely rounded to base, subparallel and convergent anteriorly, anterior angles not produced; surface glabrous, punctures small, separated on disk by about two or three times their own widths, median longitudinal furrow shallow. *Elytra* unusually long, sides subparallel; humeral umbones prominent; surface with costae faintly indicated, punctures on disk separated by about twice their own widths, sparsely clothed with short yellow pile. *Venter* sparsely clothed with yellow pile; metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 9.0 mm.; width, 3.8 mm.

**FEMALE.**—Unknown.

**TYPE MATERIAL.**—Holotype male in the collection of the Los Angeles Museum, taken in San Felipe Narrows, San Diego County, California, February 11, 1937 (G. Willett). One paratopotype in the collection of A. T. McClay and one in The American Museum of Natural History. Two paratypes from San Felipe Wash (east end), San Diego County, California, February 19, 1937, in the collection of the Los Angeles Museum.

The writers are indebted to Dr. D. W. Pierce for the privilege of studying and making known this distinct species.

*Coenonycha lurida* can be distinguished from all other species in the genus by its unusually long and narrow elytra. From *C. bowlesi* it can be further distinguished

by its deep continuous clypeal suture, by the more widely reflexed front clypeal margin, by the presence of faint elytral costae and by the less angulate side pronotal margins. It can be separated from *C. pallida*, to which it appears to be most closely related, by the narrow front of the head and clypeus and by the evenly rounded anterior clypeal angles.

#### **Coenonycha barri** Cazier, new species

Medium sized; head and pronotum yellowish brown, elytra with suture and base fuscous, remainder testaceous; metathoracic wings fully developed; elytra sparsely clothed with short yellow pile.

**MALE.**—*Head* punctate throughout; front with punctures irregular, separated above by about one-third their own widths, coalescent below; clypeus with side margins narrowly reflexed, anterior margin more widely reflexed, shallowly sinuate medially, anterior angles obtusely dentate, surface irregularly punctate, punctures distinct only at base, clypeal suture rather deeply emarginate medially, distinct throughout; antennae ten-segmented. *Pronotum* widest at middle; side margins converging posteriorly to obtusely rounded hind angles, narrowly converging to anterior angles; anterior angles not greatly produced; surface nearly glabrous, punctures on disk separated by about one and one-half times their own widths. *Elytra* with sides subparallel; humeral umbones prominent; surface without costae, punctures on disk separated by about twice their own widths. *Venter* with metasternum at narrowest point between coxae longer than width of posterior coxal plates; tarsal claws shallowly cleft subapically. Length, 8.0 mm.; width, 3.8 mm.

**FEMALE.**—Similar to the male but with metathoracic wings slightly shorter, base and suture of elytra with less fuscous areas and with entire body more robust. Length, 8.5 mm.; width, 4.1 mm.

**TYPE MATERIAL.**—Holotype male and allotype female in the collection of The American Museum of Natural History, taken at McKittrick, Kern County, California, March 21, 1940, by W. F. Barr, after whom the describer takes pleasure in naming the species. One hundred and ninety-three designated paratopotypes collected by R. G. Dahl, K. S. Hagen, E. Hagen and W. F. Barr are deposited in their collections and in those of A. T. McClay, David Rockefeller and The American Museum of Natural History. All specimens were collected on *Atriplex spinifera* Macb. at night.

*Coenonycha barri* is most closely allied to *C. crispata* but can be distinguished from that species by its fully developed metathoracic wings, darker color and shorter elytral pile. It can be distinguished from *C. ovatis* by its darker color (generally), by the presence of long metathoracic wings, by the more widely rounded side clypeal margins and by the less densely punctate elytra. Although *C. barri* superficially resembles *C. testacea*, it can be distinguished by its longer clypeus, dentiform anterior clypeal angles, deeply emarginate clypeal suture, less dense punctation of pronotum and more angulate side pronotal margins.

**Coenonycha saylora** Cazier, new species

Medium sized, subovate; testaceous throughout; metathoracic wings reduced, remigium cut transversely just beyond stigmal area, basal portions of  $R_3$  and  $M_1$  evident (Fig. 3).

**MALE.**—*Head* with impunctate area on vertex; front densely punctate, punctures separated by about one-third their own widths; clypeus with side margins prominently reflexed, reflexed portion increasing in width from base to apex, anterior margin more widely reflexed, shallowly emarginate, angles scarcely dentiform, surface rugosely punctate basally, apical half smooth, nearly impunctate, clypeal suture deeply arcuately emarginate toward base at middle; antennae ten-segmented. *Pronotum* widest at middle; side margins evenly obtusely rounded to base, straight and gradually convergent anteriorly, anterior angles acute, not sharply produced; surface smooth, glabrous, shining, punctures small, sparse, separated by about twice their own widths on disk. *Elytra* with side margins evenly rounded; humeral umbones evident but reduced; costae absent; surface with minute alutaceous sculpturing, punctures irregular, separated by about their own widths, each puncture giving rise to a short pale hair. *Venter* sparsely pilose, punctation sparse, each puncture very small; metasternum at narrowest point between coxae subequal in length to width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.0 mm.; width, 4.0 mm.

**FEMALE.**—Similar to male but more robust and with the clypeal margins less reflexed. Length, 9.0 mm.; width, 5.0 mm.

**TYPE MATERIAL.**—Holotype male in the collection of The American Museum of Natural History, taken in Fresno County, California, May. Allotype female in the collection of the California Academy of Sciences, taken in Fresno

County, California, May, 1921 (Van Dyke collection).

The describer takes pleasure in naming this species after Lawrence W. Saylor who made available much material from his extensive collection.

*Coenonycha saylora* is most closely allied to *C. crispata* but can be readily distinguished by its more widely reflexed anterior clypeal margin, scarcely dentate clypeal angles and evenly rounded lateral pronotal margins. From *C. ovatis* it can be distinguished by its more widely reflexed anterior clypeal margin, scarcely dentate clypeal angles and by the much less reduced metathoracic wings. From *C. bowlesi* it can be separated by its more widely reflexed anterior clypeal margin, evenly rounded lateral pronotal margins, by its abruptly cut metathoracic wings and its more robust form. It can be separated from *C. mediata* by its abruptly reduced metathoracic wings, distinct clypeal suture and subovate form.

**Coenonycha bowlesi** Cazier, new species

Medium sized, rather robust; uniformly pale yellow throughout; metathoracic wings somewhat reduced in size (Fig. 3).

**MALE.**—*Head* with small, smooth, impunctate area on vertex; front deeply punctate, punctures above separated by about one-fourth their own widths, below irregularly coalescent; clypeus with side margins shallowly reflexed, front margins slightly more widely reflexed, angles shallowly dentate, anterior margin nearly straight, surface with punctures obscure except along clypeal suture, clypeal suture obscure medially; antennae nine-segmented, club about as long as the five funicular segments combined. *Pronotum* widest at middle; side margins evenly rounded basally from strongly rounded median portion, anteriorly strongly convergent, shallowly sinuate before angles; anterior angles obtuse, not produced; anterior margin depressed; surface glabrous, strongly convex, punctures small, separated by about their own widths on disk. *Elytra* widest at about apical third; humeral umbones slightly reduced; surface with minute alutaceous sculpturing, costae absent, punctures separated by about twice their own widths on disk, entire surface sparsely clothed with short yellowish pile. *Venter* sparsely punctate and clothed with long yellow pile; metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 7.5 mm.; width, 3.5 mm.

**FEMALE.**—Similar to the male but much more

robust, with the hind wings somewhat more reduced, the clypeal suture depressed, clypeal surface elevated above that of front and the elytra without the alutaceous sculpturing. Length, 8.3 mm.; width, 4 mm.

**TYPE MATERIAL.**—Holotype male and allotype female in the collection of The American Museum of Natural History, taken at Benton, Mono County, California, June 30, 1938 (C. W. Bowles and J. W. Tilden). Eighty designated paratopotypes deposited in the collections of J. W. Tilden, J. J. duBois, A. T. McClay, David Rockefeller, L. W. Saylor, O. L. Cartwright, M. W. Sanderson, California Academy of Sciences and The American Museum of Natural History.

It is with pleasure that this species is named in honor of Mr. C. W. Bowles who made its collection possible. Thanks are also due J. J. duBois and J. W. Tilden who gave the specimens to the writers.

This species is most closely allied to *C. mediata* but can be separated from that species by its elevated anterior clypeal angles, less acutely produced anterior pronotal angles and by the presence of a number of well-developed veins that extend to the metathoracic wing margin (Fig. 3). From *C. pallida* it can be distinguished by its less sharply and broadly reflected clypeal margins, by having the clypeal suture obscured medially, by its more angulate side pronotal margins and by the absence of the elytral costae.

### **Coenonycha mediata** Cazier, new species

Medium sized, narrow; head and pronotum dark testaceous, elytra testaceous; metathoracic wings reduced, remigium reduced in size and without veins (Fig. 3).

**MALE.**—*Head* with impunctate area on vertex; front densely punctate, punctures separated by about one-third their own widths above and below; clypeus with side margins narrowly reflexed, anterior margin more widely reflexed, convex medially, lateral angles not dentiform or prominent, surface rugosely punctate, clypeal suture obscure medially, shallowly emarginate toward base at middle; antennae nine-segmented. *Pronotum* widest at middle; side margins obtusely rounded medially, evenly rounded to base, straight and gradually convergent anteriorly; anterior angles acute, sharply produced anteriorly; surface smooth, shining, punctures small, sparse, separated by about two to three times their own widths over entire surface. *Elytra* with side margins sub-

parallel; humeral umbones evident but reduced in size; surface with minute alutaceous sculpturing in impressions, punctures irregular, separated on the disk by about twice their own widths, each puncture giving rise to a short pale hair. *Venter* sparsely pilose, punctures small and sparse; metasternum at narrowest point between coxae only slightly longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.2 mm.; width, 3.8 mm.

**FEMALE.**—Similar to the male but more robust. Length, 9.1 mm.; width, 4.6 mm.

**TYPE MATERIAL.**—Holotype male and allotype female in the collection of The American Museum of Natural History, taken one mile west of Walker Pass, Kern County, California, April 2, 1942, by W. F. Barr. Two hundred and eighty-eight paratopotypes collected by W. F. Barr, K. S. Hagen, T. Aarons and W. F. Ferguson deposited in their collections and in those of L. W. Saylor, A. T. McClay, David Rockefeller, O. L. Cartwright and The American Museum of Natural History. All specimens were collected on *Artemisia* sp.

This species is easily confused with *C. saylora* but can be separated from that species by its convex anterior clypeal margin, less widely reflexed clypeal margins, indistinct clypeal suture, elongate and parallel form, sharply produced anterior pronotal angles and by the lack of veins in the remigium of the metathoracic wings. It can be distinguished from *C. barri* by its convex anterior clypeal margin, unelevated anterior clypeal angles, sharply produced anterior pronotal angles, longer hind tarsi and by its reduced metathoracic wings. From *C. bowlesi*, with which it appears to be most closely allied, it is separable by its less widely reflexed anterior clypeal margin, sharply produced anterior pronotal margins, less angulate lateral pronotal margins and by the veinless remigium of the metathoracic wings.

### **Coenonycha rubida** McClay, new species

Medium sized; pronotum and head reddish brown, elytra and undersurface reddish brown; pronotum, elytra and undersurface moderately clothed with yellow pile; metathoracic wings fully developed.

**MALE.**—*Head* with small smooth area on vertex; front densely punctate, punctures separated by about one-fourth their own widths above, coalescent and irregular below; clypeus

with side and front margins evenly moderately reflexed, surface with punctures coalescent but evident throughout, clypeal suture evident throughout, arcuately emarginate medially; antennae ten-segmented, club slightly shorter than the six funicular segments combined. *Pronotum* widest at middle; side margins evenly rounded behind, converging anteriorly and slightly sinuate; anterior angles acute, prominent; surface of disk with punctures separated by about twice their own widths, more densely placed laterally. *Elytra* with side margins subparallel; humeral umbones prominent; surface with costae evident, punctures on disk separated by about their own widths. *Venter* with metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.0 mm.; width, 3.5 mm.

**FEMALE.**—Similar to the male but a little larger and more robust. Length, 8.5 mm.; width, 4.0 mm.

**TYPE MATERIAL.**—Holotype male taken at Globe, Gila County, Arizona, May 16, 1936 (F. H. Parker), and allotype female taken at the base of Pinal Mountains, Graham County, Arizona, June (F. H. Parker, D. K. Duncan), in the collection of The American Museum of Natural History. Seven paratypes from the Pinal Mountains, April (F. H. Parker), and one paratype from Pinal Mountains, Graham County, Arizona, July 4, 1926 (D. K. Duncan), deposited in the collections of F. H. Parker, L. W. Saylor, O. L. Cartwright, California Academy of Sciences and The American Museum of Natural History. Seven paratopotypes in the collections of A. T. McClay, F. H. Parker and The American Museum of Natural History.

*Coenonycha rubida* is apparently only remotely allied to any of the other known species. From *C. scotti* it can be separated by its shallowly elevated anterior clypeal angles, less densely pilose and punctate pronotum and lighter color. From *C. clypeata* it can be distinguished by its more widely reflexed clypeal margins, more angulate side pronotal margins, larger pronotal punctures and by its reddish color.

#### ***Coenonycha scotti* McClay, new species**

Medium sized, narrow; dark brown throughout; metathoracic wings fully developed.

**MALE.**—*Head* with area on vertex impunctate; front densely punctate and pilose, punctures large, separated above by about one-fifth of

their own diameters, coalescent below; clypeus with side margins prominently reflexed and constricted anteriorly, anterior margin more widely reflexed, angles dentiform, anterior margin emarginate medially, surface rugose, punctures obscure, clothed with long pile, clypeal suture shallowly emarginate medially; antennae ten-segmented. *Pronotum* widest at middle; side margins obtusely angulate medially and at base, shallowly sinuate anteriorly, anterior angles acute, produced; surface smooth, punctures large, separated by about their own widths on disk, each puncture giving rise to a long yellowish hair. *Elytra* with side margins subparallel; humeral umbones prominent; costae indistinct; surface with minute alutaceous sculpturing in depressions, punctures indistinct, irregular, each puncture giving rise to a long yellowish hair. *Venter* sparsely pilose, punctation sparse and small; metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.0 mm.; width, 4.0 mm.

**FEMALE.**—Similar to male but more robust. Length, 9.6 mm.; width, 4.7 mm.

**TYPE MATERIAL.**—Holotype male and allotype female in the collection of The American Museum of Natural History, taken at Springville, Tulare County, California, June, 1933, by F. T. Scott. Ten paratopotypes deposited in the collections of L. W. Saylor, A. T. McClay and The American Museum of Natural History. Five paratypes from Porterville, Tulare County, California, May 24, 1933, in the collection of the University of Kansas. Additional specimens examined from Tulare County, California, came from Kaweah, April 12, 1931; Sequoia National Park, April 20, 1933 (2000–3000 feet), May 23, 1929, and May, 1930; Potwisha, May 8, 1931 (3000–5000 feet), May 24, 1929, and June 13, 1929.

This species is closely allied to *C. hageni* but can be distinguished from it by its strongly constricted clypeus, by the large closely placed pronotal punctures and by its shorter hind tarsi. From *C. fusca* it can be separated by its roughened elytra, longer pile, dentate anterior clypeal angles, densely punctate pronotum and by its shorter tarsi.

#### ***Coenonycha clypeata* McClay, new species**

Medium sized; pronotum and head piceous, elytra dark brown; sparsely clothed throughout

with short yellow pile; metathoracic wings fully developed.

**MALE.**—*Head* with small smooth area on vertex; front densely punctate, punctures separated by about one-half their own widths above, coalescent and irregular below; clypeus with side and front margins evenly shallowly reflexed, anterior margin not more so than side margins, surface densely confusedly punctate throughout, clypeal suture obscure; antennae ten-segmented, club nearly as long as six funicular segments combined. *Pronotum* widest at middle; sides evenly arcuate to base, converging anteriorly, shallowly sinuate immediately behind angles; anterior angles acute, prominent; surface of disk with punctures separated by about one and one-half times their own widths, more closely placed laterally. *Elytra* widest at apical third; humeral umbones prominent; surface with costae obscure, punctures on disk separated by about their own widths, irregular, surface between punctures alutaceous in spots. *Venter* with metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.1 mm.; width, 3.8 mm.

**FEMALE.**—Similar to the male but much larger and more robust. *Head* with punctures above smaller than in male, separated by about their own widths; clypeal punctures deep, coalescent but distinct. *Pronotum* with side margins more angulate medially; surface with punctures smaller than in male, separated on disk by about twice their own widths, scarcely more dense laterally. *Elytra* with discal costae somewhat elevated, irregular; surface with punctures small, separated on disk by about twice their own widths. *Venter* similar to male. Length, 10.9 mm.; width, 5.0 mm.

**TYPE MATERIAL.**—Holotype male and allotype female in the collection of The American Museum of Natural History, taken at Avalon, Santa Catalina Island, California, March 1, 1932, and May 11, 1932 (D. C. Meadows). Five paratopotypes in the collections of A. T. McClay and The American Museum of Natural History. One paratype from Santa Catalina Island, California, March 1, 1930 (D. C. Meadows), in the collection of the California Academy of Sciences. One paratopotype in the collection of the Los Angeles Museum. One paratopotype from the Wickham collection in the United States National Museum.

This species appears to be allied to *C. rubida* but can be readily separated from it by its more obtusely rounded anterior clypeal margins, by the sparsely pilose

front of the head, by the obscured clypeal suture, by the much smaller pronotal punctures, by the proportionately longer elytra and by its darker color. From *C. fulva* it is distinguishable by its equally reflexed clypeal margins, by its much larger and more densely placed frontal punctures, by the sparsely pilose front of the head and by its darker color. *C. clypeata* is distinguishable from both of the above species by the greater sexual dimorphism. The female is much larger than the male and differs as noted in the allotype description. The females of *C. rubida* and *C. fulva* do not differ greatly from the males.

### *Coenonycha fulva* McClay, new species

Medium sized; fulvous throughout; elytra and pronotum sparsely clothed with long yellow pile; metathoracic wings fully developed.

**MALE.**—*Head* with small smooth area on vertex; front flattened, punctures separated by about their own widths; clypeus with side margins shallowly reflexed, anterior margin more widely reflexed, shallowly emarginate, angles scarcely dentate, surface with punctures shallowly indicated, clypeal suture distinct, shallowly emarginate medially; antennae ten-segmented, club as long as length of five distal funicular segments combined. *Pronotum* widest at middle, side margins evenly rounded to base, narrowly convergent anteriorly, shallowly sinuate behind anterior angles; anterior angles acute, produced; surface finely punctate, punctures on disk separated by two to three times their own widths. *Elytra* with sides subparallel; humeral umbones prominent; surface with costae scarcely evident, punctures on disk separated by about twice their own widths, occasionally connected with furrows. *Venter* with metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.0 mm.; width, 3.5 mm.

**FEMALE.**—Similar to the male but with clypeal margins less widely reflexed. Length, 8.0 mm.; width, 3.8 mm.

**TYPE MATERIAL.**—Holotype male and allotype female in the collection of The American Museum of Natural History, taken at Avalon, Santa Catalina Island, California, May 12, 1932 (D. C. Meadows). Fifty-two paratopotypes March 1, 1932; twenty-six paratopotypes April 28, 1932; forty-two paratopotypes May 2-28, 1932, deposited in the collections of the Los Angeles Museum, O. L. Cartwright, L. W.

Saylor, David Rockefeller, M. W. Sanderson, California Academy of Sciences, A. T. McClay and The American Museum of Natural History.

This species appears to be most closely allied to *C. hageni* but can be readily distinguished from that species by its flattened, less densely punctate front of the head, by its much narrower clypeus, by its more evenly rounded side pronotal margins, by the smaller pronotal punctures, shorter and less dense elytral pile and by its lighter brown color. From *C. acuta* it can be separated by its having the front of the head glabrous, by its less widely reflexed anterior clypeal margins, by its having the anterior clypeal angle obtuse rather than acute, by its smaller pronotal punctures and by the lighter color of the elytra. It can be distinguished from *C. clypeata*, which occurs on the same island, by the differences listed in the comparative description of that species.

#### **Coenonycha fusca** McClay, new species

Medium sized; dark reddish brown throughout; pronotum, elytra and undersurface sparsely clothed with short yellow pile; metathoracic wings fully developed.

**MALE.**—*Head* with smooth area on vertex; punctures on front separated by about one-half their own widths above, coalescent below; clypeus with margins evenly, rather widely reflexed, anterior margin shallowly emarginate, surface with punctures at base large and coalescent, obscure apically, clypeal suture evident throughout, shallowly emarginate medially; antennae ten-segmented, club nearly as long as the length of six funicular segments combined. *Pronotum* widest at middle; side margins obtusely rounded basally, narrowly converging anteriorly; anterior angles acute, not prominently produced; surface smooth, punctures of disk separated by about twice their own diameters, more dense laterally. *Elytra* with side margins subparallel; humeral umbones prominent; surface with costae faint, punctures on disk separated by about twice their own widths, area between punctures along striae alutaceous. *Venter* with metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.0 mm.; width, 3.5 mm.

**FEMALE.**—Similar to the male but more robust and darker brown in color. Length, 8.0 mm.; width, 3.8 mm.

**TYPE MATERIAL.**—Holotype male taken at Kaweah, Tulare County, California, March 22, 1931, by R. S. Wagner; allotype

female from the same locality, April 12, 1931 (R. S. Wagner); both in the collection of The American Museum of Natural History. Forty-four paratypes from Sequoia National Park, Tulare County, California, May 5–28, 1931, and June 14, 1929 (A. T. McClay); one hundred and forty-four paratypes from Auburn, Placer County, California, May 6, 1937 (A. T. McClay); sixty-three paratopotypes (R. S. Wagner), deposited in the collections of F. T. Scott, L. W. Saylor, David Rockefeller, O. L. Cartwright, M. W. Sanderson, California Academy of Sciences, A. T. McClay and The American Museum of Natural History. Additional specimens examined were taken at Napa, Napa County, California, March 30, 1937, on *Adenostoma fasciculatum* H. and A.

This species appears to be most closely allied to *C. purshiae* but can be separated from that species by its evenly rounded anterior clypeal angles, shallowly emarginate clypeal suture and by its less acutely produced anterior pronotal angles. From *C. ampla* it can be distinguished by its smaller size, evenly rounded anterior clypeal angles and by its less acutely produced anterior pronotal angles.

#### **Coenonycha utahensis** McClay, new species

Medium sized, narrow; uniformly dark testaceous; elytra sparsely clothed with short yellow pile; metathoracic wings fully developed.

**MALE.**—*Head* with vertex impunctate; front densely punctate, punctures separated by about one-fifth their own widths above, coalescent below; clypeus with side margins prominently reflexed, anterior margin more widely reflexed, than lateral margins, angles feebly elevated, anterior margin shallowly emarginate, surface cribrately punctate, clypeal suture shallowly arcuately emarginate toward base at middle; (antennae lacking). *Pronotum* widest at middle; side margins obtusely angulate at middle and basal third, straight and gradually converging anteriorly; anterior angles acute but not produced; surface smooth, glabrous, shining, punctures small, sparse, separated on disk by about three times their own widths. *Elytra* with side margins subparallel; humeral umbones prominent; costae scarcely evident; surface with minute alutaceous sculpturing, punctures irregular, separated by about three times their own widths, each puncture giving rise to a short pale hair. *Venter* sparsely pilose, punctures small and sparse, separated by about four



times their own widths; metasternum at narrowest point between coxae longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.5 mm.; width, 3.8 mm.

**FEMALE.**—Similar to male but more robust, lateral pronotal margins shallowly emarginate in front of middle. Length, 8.5 mm.; width, 4.0 mm.

**TYPE MATERIAL.**—Holotype male and allotype female, taken in Washington County, Utah, in the collection of the United States National Museum. One female paratopotype, and one female paratype from Bellevue, Washington County, Utah, in The American Museum of Natural History.

This species may be confused with *C. fusca* but can be distinguished from it by its unemarginate anterior clypeal margin, its lighter color and by the obtusely angulate posterior pronotal margin. From *C. rubida* it can be readily separated by its smaller and less densely placed pronotal punctures and by the short, sparse, elytral pile. It appears to be most closely allied to *C. testacea* but can be separated by its darker color, obscure clypeal suture and less deeply emarginate anterior clypeal margin.

***Coenonycha globosa* McClay,**  
new species

Small, robust; uniformly testaceous throughout; pronotum, elytra and undersurface sparsely clothed with short yellow pile; metathoracic wings rudimentary, consisting of small narrow vestiges extending little beyond middle of elytra (Fig. 3).

**MALE.**—*Head* with small smooth area on vertex; punctures of front separated by about their own widths above, more densely placed below; clypeus with side margins shallowly reflexed, anterior margin more widely reflexed, anterior angles shallowly, obtusely dentate, anterior margin shallowly emarginate, surface irregularly covered with large shallow punctures, clypeal suture evident throughout, shallowly emarginate medially. *Pronotum* widest slightly in front of middle; side margins abruptly converging behind, less abruptly constricted anteriorly; anterior angles acute, not produced, posterior margin evenly rounded laterally; surface with shallow median impression, punctures of disk separated by about twice their own widths, irregularly placed, more dense laterally. *Elytra* with side margins evenly rounded, widest behind middle; humeral umbones small, barely visible; surface without evidence of costae on disk, punctures minute,

separated on disk by about three times their own widths, irregular transverse rugae along suture. *Venter* with metasternum at narrowest point between coxae subequal in length to width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 6.0 mm.; width, 3.0 mm.

**FEMALE.**—Similar to male but somewhat larger and with elytral punctation more evident. Length, 7.8 mm.; width, 3.8 mm.

**TYPE MATERIAL.**—Holotype male from Ellensburg, Kittitas County, Washington, April 20, 1935 (W. W. Baker), and allotype female, same locality and date (S. E. Crumb), in the collection of W. W. Baker. Two paratopotypes also in his collection, one in the collection of A. T. McClay and two in the collection of The American Museum of Natural History. The writers take this opportunity to thank Mr. Baker for these specimens.

*Coenonycha globosa* resembles *C. parvula* in shape and size but can be distinguished from it by its less densely punctate and glabrous front of the head and surface of the pronotum, by the reduced punctation and shorter, more sparse elytral pile and by its lighter testaceous color. From *C. ovipennis*, which seems to be its nearest relative, it can be separated by its more angulate side pronotal margins, its more prominent front clypeal angles and by its less pilose elytra.

***Coenonycha ovipennis* Horn**

*Coenonycha ovipennis* HORN, G., 1876, Trans. Amer. Ent. Soc., V, pp. 193–194; FALL, 1901, Trans. Amer. Ent. Soc., XXVII, p. 293.

Medium sized, elongate oval; testaceous throughout; metathoracic wings reduced to a short and narrow vestige.

**FEMALE.**—“Head coarsely but very sparsely punctured, frontal suture distinct, feebly impressed. Clypeus rounded in front, margin moderately reflexed. Thorax twice as broad as long, sides gradually divergent posteriorly, hind angles broadly rounded, surface smooth, sparsely and not coarsely punctured, margins with long fimbriae. Elytra oval, slightly broader behind the middle, humeri obtusely rounded, surface very sparsely punctate and with inconspicuous pubescence. Body beneath very sparsely punctured and sparsely hairy. Length 7.5 mm.

"The apterous body and eight-jointed antennae serve to distinguish this species. The clypeus also differs considerably in form from *rotundata*. The third and fourth joints of the antennae are moderately long and appear to be connate, each one having the appearance of being formed by the fusion of two joints. This will account for the antennae being eight-jointed in this, and ten-jointed in the preceding species [*rotundata*]."

TYPE LOCALITY.—Nevada (female).

No additional specimens of this species have been seen so that the limitations of the variation cannot be established at this time. Its relationships with other species are also doubtful, but judging from available material it appears to be most closely allied to *C. globosa*. It can, however, be separated from that species by its having the scutellum longer than broad and by its evenly rounded lateral pronotal margins.

### *Coenonycha stohleri* Saylor

*Coenonycha stohleri* SAYLOR, 1935, Pan-Pacific Ent., XI, p. 131.

Small, oblong-ovate; black; metathoracic wings reduced to short, narrow vestiges (Fig. 3).

MALE.—*Head* with large area on vertex impunctate; front densely punctate, punctures separated by about their own widths above, cribrately punctate below; clypeus with side margins moderately reflexed, anterior margin more widely reflexed, convex medially, anterior angles only feebly dentate, surface cribrately punctate, clypeal suture obscure and only slightly emarginate medially; antennae ten-segmented. *Pronotum* widest at middle; side margins obtusely angulate medially, evenly rounded to base, straight and gradually convergent anteriorly, anterior angles acute, not sharply produced; surface smooth, shining, punctures small, sparse, separated by about twice their own widths on the disk. *Elytra* subovate, side margins evenly rounded; humeral umbones lacking; costae not evident; surface with minute alutaceous sculpturing in depressions, punctures minute and irregular, each puncture giving rise to a short white hair, disk transversely rugulose. *Venter*

sparsely pilose, punctation sparse; metasternum at narrowest point between coxae subequal in length to width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 5.7 mm.; width, 2.8 mm.

FEMALE.—Unknown.

TYPE LOCALITY.—White Rock Springs, Nye County, Nevada, May, 1931 (R. Stohler).

This species is apparently most closely related to *C. globosa*, from which it can be distinguished by its black color, convex anterior clypeal margin, scarcely dentate anterior clypeal margin, and by its smaller size.

### *Coenonycha crispata* McClay, new species

Medium sized, narrow; uniformly testaceous throughout; metathoracic wings reduced, remigium cut transversely just beyond stigmal area (Fig. 3).

MALE.—*Head* with impunctate area on vertex; front densely punctate, punctures separated by about one-fifth of their own widths; clypeus with side margins narrowly reflexed, anterior margin widely reflexed, bisinuate medially, angles strongly dentiform; surface rugosely punctate basally, sparsely punctate in anterior third, clypeal suture shallowly arcuately emarginate toward base at middle; antennae ten-segmented. *Pronotum* widest at middle; side margins obtusely subangulate medially and basally, straight and gradually convergent anteriorly; anterior angles obtuse, not produced; surface smooth, shining, punctures small, sparse, separated by about twice their own widths on disk, each puncture giving rise to a short yellow hair. *Elytra* with side margins evenly, not strongly, rounded; humeral umbones evident but reduced; costae absent; surface with minute alutaceous sculpturing, punctures irregular, separated by about twice their own widths, each puncture giving rise to a short pale hair. *Venter* sparsely pilose, punctation sparse, each puncture small; metasternum at narrowest point between coxae subequal in length to the width of the hind coxal plates; tarsal claws deeply cleft subapically. Length, 7.6 mm.; width, 3.7 mm.

FEMALE.—Similar to male but more robust. Length, 8.0 mm.; width, 4.1 mm.

TYPE MATERIAL.—Holotype male and allotype female in the collection of The American Museum of Natural History, taken in Kern County, California, March 30, 1914. Ten paratopotypes deposited in the collections of A. T. McClay, David

Rockefeller and The American Museum of Natural History. One paratype from Kern County, California, April, 1913 (Van Dyke collection) in the California Academy of Sciences. Other specimens examined include two from Kern County, California, April 3, 1914 (K. Knowlton), in the California Academy of Sciences, and one from Famosa, Kern County, California, in The American Museum of Natural History.

This species appears to be closely related to *C. barri* but can be separated from it by its long hind tarsi and reduced metathoracic wings. From *C. ovatis* it can be distinguished by the well-expanded anal membrane on the metathoracic wings, by the well-developed 2dA and 3dA and by its more elongate shape. From *C. saylora* it can be separated by its strongly dentate clypeal angles and by its subangulate lateral pronotal margins.

***Coenonycha ovatis* McClay,**  
new species

Medium sized, robust; uniformly testaceous throughout; pronotum, elytra and under-surface sparsely clothed with short yellow pile; metathoracic wings extending little beyond middle of elytra (Fig. 3).

MALE.—*Head* with small, irregular, smooth area on vertex; punctures of front separated by about one-half their own widths above, more closely placed laterally and below, small impunctate area on middle of front above clypeal suture emargination; clypeus with side margins prominently reflexed, anterior margin more widely so, anterior angles rather prominent, front margin shallowly sinuate medially, surface irregularly punctate, clypeal suture evident throughout, rather deeply emarginate medially; antennae ten-segmented, club nearly as long as the six funicular segments combined. *Pronotum*

widest at middle; sides evenly rounded to base, narrowly converging anteriorly; anterior angles prominent, not produced; surface rather convex, punctures of disk small, separated by about twice their own widths, more dense laterally. *Elytra* with sides evenly rounded, widest about middle; humeral umbones somewhat reduced; surface without costae, punctures of disk separated by about their own widths. *Venter* with metasternum at narrowest point between coxae only slightly longer than width of hind coxal plates; tarsal claws shallowly cleft subapically. Length, 8.0 mm.; width, 3.8 mm.

FEMALE.—Similar to male but more robust throughout. Length, 8.0 mm.; width, 4.0 mm.

TYPE MATERIAL.—Holotype male and allotype female in the collection of The American Museum of Natural History, taken at Arvin, Kern County, California, March 20, 1932 (R. S. Wagner). Eight paratopotypes in the collections of F. T. Scott, A. T. McClay, California Academy of Sciences and The American Museum of Natural History.

This species can be distinguished from *C. parula* by its larger size, its glabrous head, by the small and sparse pronotal punctures and by its short sparse pronotal and elytral pile. From *C. globosa* it can be separated by its larger size, more prominent anterior clypeal angles, by the smaller and more evenly placed pronotal punctures, by the rounded lateral pronotal margins behind middle and by the more regular and larger elytral punctures. It can be distinguished from *C. ovipennis* by the obtusely angulate side pronotal margins, by the prominent anterior clypeal angles and by the sparse short pile throughout. *C. ovatis* appears to be most closely related to *C. crispata* and is compared with it in the discussion of that species.

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