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

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ABSTRACT

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

INTRODUCTION

Knight (1927) described *Megalopsallus*, with five included species, designating *atriplicis* Knight from the Texas Gulf Coast as

the type. Later, Knight (1968) described numerous species in the genus *Europiella* Reuter, many of which were subsequently moved to *Megalopsallus* by Schuh et al. (1995), on

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the basis of male genitalic structure. The latter authors did not, however, deal with issues of synonymy and description of new taxa within *Megalopsallus*.

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

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

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

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

The habitus photographs are not all reproduced at a comparable scale. Thus, relative sizes of the taxa should not be assessed by comparing the figures. Detailed measure-

ments for all species are given in table 1, and these data should be used for making size comparisons. All measurements are given in millimeters. Species treatments are presented in alphabetical order.

Megalopsallus Knight

Megalopsallus Knight, 1927: 224 (n. gen.).

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

Ankylotylus Knight, 1968: 55 (n. gen.; syn. by Schuh, 1986: 217).

TYPE SPECIES: *Megalopsallus atriplicis* Knight, 1927.

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

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

(1927) characterization of pulvillar structure in *Megalopsallus* was in error.

REDESCRIPTION: *Male:* Small to moderately large species, total length 2.31–5.20, length apex clypeus–cuneal fracture 1.73–3.31, width across pronotum 0.83–1.32; usually elongate and more or less parallel sided (figs. 7–12). **COLORATION AND VESTITURE:** Coloration, including all appendages, ranging from totally pale, white, to almost totally black, often greenish or reddish. Vestiture of dorsum comprising reclining or recumbent, pale to dark, simple setae intermixed with white, silvery, or rarely somewhat golden, weakly to moderately flattened, usually lanceolate, sometimes woolly, setae (figs. 7–12), latter type also occurring on thoracic pleuron and abdominal venter. Tibial spines pale or dark, with or without dark spots at bases. **STRUCTURE:** Body form generally somewhat flattened; head broad, short longitudinally and clypeus not visible from above. Eyes sometimes bulging and removed from pronotal margin, more commonly conforming to curvature of frons and to anterior pronotal margin. Antennal segment 2 cylindrical (figs. 5, 6) or more rarely spindle-shaped, especially in females (fig. 23). Hemelytra often elongate to strongly elongate and nearly parallel-sided, abdomen often reaching only to cuneal fracture, less frequently hemelytra not so elongate and body form elongate ovoid. Metathoracic scent-gland evaporatory area as in figs. 1B, 3B, etc.; mesothoracic spiracle with an elongate, conspicuous area of “mushroom bodies” dorsad of spiracle (figs. 3B, 4B). Claws ranging from relatively short and curving only near apex (fig. 1D) to relatively long and slender, smoothly curving over entire length (fig. 17E); pulvilli ranging from minute (fig. 17E) to large and covering nearly entire ventral claw surface (fig. 18C). Abdomen in males flattened dorsoventrally, broad basally and broadly curving and narrowing toward relatively small genital capsule (fig. 17B). **MALE GENITALIA:** Genital capsule and genitalia small relative to size of animal (fig. 17B); vesica formed of a single strap usually twisted to form an S shape (figs. 13, *atriplicis*), more rarely forming a weak coil (fig. 13, *brendae*) or not twisted and in the shape of a J (figs. 16, *punctatus*); apex of vesica

often sclerotized and attenuated, as either a single spine or bifid, sometimes membranous; (secondary) gonopore either apical or subapical, occasionally only weakly sclerotized; gonopore sclerite subtending gonopore often present and well sclerotized (figs. 13–16, gs), never with barbs as in many *Atractotomus* species; paramere and phallosome typical of Phylini, without distinctive characteristics (figs. 14–16).

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

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

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

In addition to the above described morphological differences, the host associations in *Megalopsallus* are distinctive within this related group of genera. *Megalopsallus* spp. are restricted to halophytes in the genus *Ephedra* of the primitive seed-plant group Ephedrales and among the angiosperms pri-

marily to several genera in the Chenopodiaceae and to the solanaceous genus *Lycium*. *Knightmiroides*, *Phoenicocoris*, *Pinomiris*, and some *Atractotomus* spp. feed on the Coniferales with the remaining *Atractotomus* spp. breeding on a variety of angiosperms; none are known to feed on the Chenopodiaceae, Solanaceae, or Ephedraceae (Stonedahl, 1990; Stonedahl and Schwartz, 1996).

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

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

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

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

Nasocoris Reuter from the Mediterranean and adjacent areas appears to feed exclusively on *Ephedra* (Schuh, 1995), which might suggest a relationship with *Megalopsallus*. However, the clypeus is distinctively flattened and extended and antennal segment 1

is moderately to greatly elongate and clothed with long to very long more-or-less erect setae. The vesica appears to be formed of a single strap, as in *Megalopsallus*, and the genital capsule is relatively small. The general appearance and coloration of *Nasocoris tesquorum* Kerzhner are similar to those of *Megalopsallus pallidus* and the dorsal vestiture is also similar to that of *Megalopsallus* spp. (Wagner, 1973).

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

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

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

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

The following key to species is designed for use with male specimens. For most species the description of coloration will also pertain to females, although table 1 will have to be consulted for measurements. For a few

species it will be necessary to dissect the male genitalia to be confident of the identification. Sometimes host information will allow accurate identification of species such as *humeralis* and *nigrofemoratus*, which on the basis of external morphology and coloration may be virtually indistinguishable.

CHECKLIST OF SPECIES NAMES PROPOSED OR USED WITHIN *MEGALOPSALLUS* KNIGHT

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

sarcobati Knight, 1969 (*Europiella*)
schwartzi, new species
sparsus Van Duzee, 1918 (*Europiella*)
stitti Knight, 1968 (*Europiella*)
suaedae Knight, 1925 (*Psallus*)
teretis, new species
viridiventrif Knight, 1968 (*Europiella*)

KEY TO MALES OF *MEGALOPSALLUS* KNIGHT

1. Dorsum, including head, nearly unicolorous pale, usually greenish, sometimes almost white or yellowish or pinkish; dorsum sometimes with small reddish spots or other markings on head, pronotum, and scutellum, or light brown spots at bases of setae 2
 - At least head, and often much of dorsum, darkened, ranging from pale reddish to nearly black 15
2. Membrane marmorate; entire dorsum, venter, and appendages pale green (fig. 7); legs with some small brown spots; male genitalia as in figure 13 (San Joaquin Valley, California; host unknown) . . . *californicus*
 - Membrane not marmorate; coloration of dorsum pale, sometimes greenish or pinkish 3
3. Antennal segment 1 almost entirely dark; dorsum pale green (see fig. 7, *brendae*) . . . 4
 - Antennal segment 1 entirely pale; dorsum greenish or otherwise pale, although sometimes with reddish or brownish on pronotum and scutellum (see fig. 10, *pallidus*) 5
4. Femora pale green with some distinct black spots (fig. 7); vertex and calli sometimes weakly infuscate; frons often with a dark transverse line at level of base of clypeus; genitalia as in figure 13 (Mojave Desert; ex *Lycium*, Chenopodiaceae sp.) . . . *brendae*
 - Femora castaneous, usually appearing somewhat mottled (fig. 11); head and pronotum with some small red spots; genitalia as in figure 16 (Mojave Desert and south; ex *Allenrolfea*, *Salsola*, *Suaeda*) *pictipes*
5. Body and appendages entirely pale (see fig. 10, *pallidus*) 6
 - At least some areas not pale, e.g., medial areas of pronotum and scutellum, thoracic sternum, spots on femora, and dark bases of tibial spines (see fig. 12, *sparsus*) . . . 7
6. Eyes white (fig. 10); larger species, total length 4.01–4.35, length apex clypeus–cuneal fracture 2.61–2.83, width across pronotum 1.09–1.19; genitalia as in figure 15 (Nevada; ex *Atriplex*, *Grayia*) *pallidus*

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

- than remainder of dorsum (fig. 7); genitalia as in figure 14 (central Nevada; ex *Sarcobatus baileyi*) *flammeus*
- Pronotum and scutellum of same shade as remainder of dorsum (fig. 8); genitalia as in figure 14 (southern Utah to northern Baja California; ex *Ephedra*) *ephedrae*
18. Coloration of dorsum entirely dark, ranging from brown to black (figs. 9, 10, 12, 21, 23) 19
- Coloration of dorsum never completely dark, ranging from completely pale to partly dark 22
19. Relatively large species, total length 4.51–5.20, length apex clypeus–cuneal fracture 2.79–3.31, width across pronotum 1.15–1.32; antennal segment 2 slender, of uniform diameter, never spindle-shaped (fig. 9); genitalia as in figure 14 (northern Great Basin; ex *Sarcobatus vermiculatus*) *knowltoni*
- Smaller species, total length in males 2.57–3.88, length apex clypeus–cuneal fracture 1.74–2.46, width across pronotum 0.94–1.16; shape of antennal segment 2 straight or spindle-shaped 20
20. Antennal segment 2 in males enlarged, cylindrical, but diameter at most slightly greater than diameter of segment 1 (figs. 12, 22); antennal segment 2 in females moderately to strongly spindle-shaped (figs. 12, 23); antennae and legs conspicuously reddish in most specimens; genitalia as in figure 16 (southern Nevada to Zacatecas, Mexico; ex *Lycium*) *teretis*
- Antennal segment 2 cylindrical in both sexes, never spindle-shaped, diameter slightly less than that of segment 1; vesica not as in figure 16; coloration of legs and antennae sometimes reddish 21
21. Genitalia as in figure 15; antennal segments 1 and 2 varying from pale to reddish (fig. 10) (Canada to central Mexico; ex *Atriplex*, *Grayia*,) *nigrofemoratus*
- Genitalia as in figure 14; antennal segments 1 and 2 varying from pale to dark (fig. 9) (southern Nevada and California, Arizona, Baja California; ex *Lycium*) *humeralis*
22. Head and eyes castaneous, strongly contrasting with pale green to nearly white remainder of dorsum (figs. 6, 9); antennal segment 1, thoracic venter (including coxae), and much of femora also castaneous; genitalia as in figure 15 (Arizona, Mojave Desert; ex *Lycium*) *nigricaput*
- If head and eyes castaneous, then remainder of dorsum never entirely pale 23
23. Head, pronotum, mesoscutum, sometimes part or all of scutellum, and extreme base of hemelytra ranging from pale red to castaneous, in contrast to white or pale green remainder of dorsum 24
- Coloration variable, but never exactly as above, and if hemelytra mostly pale then abdomen mostly dark, or at most partially pale with at least some reddish or infuscate areas 25
24. Coloration as in figure 11; abdomen pale green, strongly contrasting with castaneous thoracic pleuron and venter; genitalia as in figure 16 (Great Basin; ex *Sarcobatus*) *rubricornis*
- Coloration as in figure 8; abdomen pale green, thoracic pleuron and venter pale orange; genitalia as in figure 13 (west Texas; ex *Ephedra*) *ephedrellus*
25. Head, pronotum, and usually scutellum entirely castaneous to nearly black, or if not entirely so, then only posterior humeral angles of pronotum and sometimes apex of scutellum pale 26
- Head, pronotum, and scutellum not entirely castaneous, often largely pale 30
26. Dark coloration of pronotum contrasting with that of hemelytra, the latter ranging from largely pale to distinctly orange or reddish 27
- Dark coloration of pronotum usually not strongly contrasting with coloration of hemelytra; if hemelytra pale, then cuneus never reddish 29
27. Head, pronotum, entire venter, and all femora deep reddish to castaneous, contrasting with pale (but not white) coloration of hemelytra (figs. 5, 9); cuneus always weakly reddish; genitalia as in figure 15 (southern Arizona, Mexico; ex *Lycium*) *nicholi*
- Head, pronotum, and scutellum nearly black; hemelytra, including cuneus, deep orange to red orange 28
28. Head, pronotum, and scutellum dull; femora unicolorous dark (fig. 8); tibiae infuscate; genitalia as in figure 14 (southern Nevada and Utah south to central Baja California; ex *Ephedra*) *ephedrae*
- Head, pronotum, and scutellum polished and moderately to strongly shining (fig. 8); femora pale at least on distal one-half; tibiae pale (southern Nevada, Utah, and California; ex *Ephedra*) *froeschneri*
29. Genitalia as in figure 15; antennal segments 1 and 2 usually pale, although sometimes reddish (fig. 10) (Canada to central Mexico; ex *Atriplex*, *Grayia*, and *Sarcobatus*) *nigrofemoratus*

- Genitalia as in figure 14; antennal segments 1 and 2 usually dark, less commonly reddish or pale (fig. 9) (southern Nevada and California, Arizona, Baja California; ex *Ly-cium*) *humeralis*
- 30. Hemelytra most frequently entirely pale, usually weakly greenish or grayish; head, anterior lobe of pronotum, mesoscutum, and more rarely hemelytra broadly dark (fig. 12); genitalia as in figure 16 (Texas to southern California; ex *Atriplex*) *sparsus*
- Coloration of dorsum reddish, often spotted or mottled, never greenish or grayish 31
- 31. Larger species, total length 3.57–3.82, length apex clypeus–cuneal fracture 2.58–2.71, width across pronotum 1.18–1.29 (fig. 7); antennal segment 2 relatively long, length 1.04–1.16; genitalia as in figure 13 (coastal Connecticut south to Florida and east to Texas); host unknown *brittoni*
- Smaller species, total length 3.09–3.24, length apex clypeus–cuneal fracture 2.16–2.29, width across pronotum 0.99–1.07 (fig. 7); antennal segment 2 relatively short, length 0.83–0.92; genitalia as in figure 13 (northern Rockies; ex *Salicornia*) *femoralis*

Megalopsallus atriplicis Knight

Figures 7, 13

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

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

DESCRIPTION: *Male:* Small, elongate, total length 3.25–3.77, length apex clypeus–cuneal fracture 2.20–2.48, width across pronotum 0.95–1.04. **COLORATION:** General coloration cream to faded orange; vertex, anterior margin of pronotum, and all femora with some reddish spots (fig. 7); eyes red; thoracic pleuron and venter, all coxae, and much of abdomen in females heavily infus-

cate; tibiae pale with dark spots at bases of pale spines. **SURFACE AND VESTITURE:** Dorsum smooth, weakly shining, clothed with recumbent, pale, simple setae intermixed with silvery, weakly flattened setae. **STRUCTURE:** Hemelytra moderately elongate, nearly parallel sided; eyes in males large, protuberant (fig. 7); labium reaching posterior margin of middle trochanters; claws relatively long and slender, smoothly curving; pulvilli minute. **MALE GENITALIA:** Vesica weakly sigmoid, slender (fig. 13), attenuated apically; gonopore small, subapical, not subtended by a gonopore sclerite (fig. 13).

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

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

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

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

SPECIMENS EXAMINED: USA. — **Arizona:** *Coconino Co.:* 1 mi E of Tuba City on Rt. 163, 5000 ft, June 16, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 4♂, 3♀ (AMNH). **California:** *Inyo Co.:* 2 mi E of Big Pine, June 10, 1976–June 22, 1978, J. D. Pinto, *Sarcobatus vermiculatus* (Chenopodiaceae), 2♂, 5♀ (UCR). *Mono Co.:* 8 mi W of Nevada state line on Rt. 359, 6700 ft, July 2, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 6♂, 12♀ (AMNH). **Colorado:** *Mineral Co.:* Creede,

June 21, 1990, J. T. and D. A. Polhemus, 1♂, 2♀ (JTP). *Moffat Co.*: Gates of Lodore, June 28, 1979, D. A. Polhemus, 1♂, 1♀ (JTP). *Rio Blanco Co.*: W Evacuation Creek, 4 mi SE of state line on Rt. 45, 6400 ft, July 9, 1981, M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♀ (AMNH). **Montana**: *Carbon Co.*: Bear Creek between Red Lodge and Belfry, 5000 ft, August 12, 1986, Schwartz and Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 2♂, 13♀ (AMNH). **Nevada**: *Elko Co.*: Elko, July 12, 1965, H. H. Knight, 2♂, 17♀ (USNM). Utah state line on Utah Rt. 30, 4760 ft, June 25, 1983, Schuh and Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 4♂, 27♀ (AMNH). *Esmeralda Co.*: 13 mi W of Lida on Rt. 3, 1938 m, July 13, 1980, R. T. Schuh and G. M. Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♂, 1♀ (AMNH). *Lander Co.*: 11 mi S of Rt. 50 on Rt. 376, T17N R44E, 5800 ft, June 28, 1983, Schuh and Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♂, 14♀ (AMNH). 7.5 mi S of Rt 50 on Rt 376, T17N R44E, 5900 ft, June 28, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♀ (AMNH). *Lincoln Co.*: Cathedral Gorge State Park, June 17, 1986, J. B. Knight and K. R. Helms, 8♂, 1♀ (AMNH). *Nye Co.*: 2.5 mi NE of Gabbs off Rt. 844, 4800 ft, July 2, 1983, R. T. Schuh and M. D. Schwartz, 8♂ (AMNH). 30 mi S of Rt. 50 on Rt 376, T13N R14E, 6000 ft, June 30, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* var. *bailleyi* (Chenopodiaceae), 1♂ (AMNH). 35 mi N of Tonapah, Coyote Hole Spring/Sevier Reservoir, T8 R42E S11 & 23, 6000 ft, June 29, 1983, R. T. Schuh and M. D. Schwartz, 83♂ (AMNH). 35 mi N of Tonapah, Coyote Hole Spring/Sevier Reservoir, T8 R42E S11 & 23, 6000 ft, June 30, 1983, Schuh, Schwartz, *Sarcobatus vermiculatus* var. *bailleyi* (Chenopodiaceae), 1♂, 10♀ (AMNH). *Washoe Co.*: 2 mi E of Vya on Rt. 8A, 1750 m, July 2, 1979, R. T. Schuh and B. M. Massie, 2♂, 26♀ (AMNH). **New Mexico**: *Eddy Co.*: April 24, 1979, Burke, Dolorme, Schaffner, 5♂ (TAMU). *Taos Co.*: Ojo Caliente, June 6, 1982, D. A. and J. T. Polhemus, *Atriplex* sp. (Chenopodiaceae), 2♂ (JTP). **Oregon**: *Harney Co.*: T41S R36E S8, July 16, 1979, M. J. Smith, N. Cobb, 1♀ (OSU). T41S R35E S5, July 6, 1979, M. J. Smith, N. Cobb, 1♂ (OSU). T36S R35E S8, June 26, 1979–September 4, 1979, M. J. Smith and N. Cobb, 5♂, 1♀ (OSU). T34S R35E S10 NE, July 12, 1979, Neil Cobb, 1♀ (OSU). **Texas**: *Calhoun Co.*: Port Lavaca, August 19, 1925–September 10, 1925, 7♂, 4♀ (USNM). *Cameron Co.*: Brownsville, April 17, 1925, Div. Cotton Insects, *Atriplex texana* (Chenopodiaceae), 2♂ (USNM). Brownsville, April 25, 1926, T. C. Barber, *Atriplex matamorensis* (Chenopodiaceae), Paratypes: 7♂, 14♀ (CNC, USNM); holotype: male (USNM). Brownsville, February 1, 1926, T. C. Barber, *Atriplex matamorensis* (Chenopodiaceae), Paratypes: 7♂, 10♀ (USNM). Brownsville, February 15, 1925, T. C. Barber, *Atriplex matamorensis* (Chenopodiaceae), Paratypes: 1♂ (USNM). Brownsville, June 23, 1908, 1♂, 3♀ (USNM); Paratypes: 6♂, (USNM). Brownsville, May 1, 1925, Div. Cotton Insect, *Atriplex matamorensis* (Chenopodiaceae), 15♂, 15♀ (USNM). **Utah**: *Box Elder Co.*: S. Valed Site, August 24, 1972, W. J. Hanson, 1♂ (USU). *Cache Co.*: Logan, July 22, 1938, G. F. Knowlton, D. E. Hardy, 1♀ (USU). *Emery Co.*: Green River, May 21, 1963, G. F. Knowlton, 1♂ (USU). *Garfield Co.*: 14.3 S of Rt. 95 on Rt. 276 (3.4 mi N of Starr Spring turnoff), 5000 ft, June 19, 1983, Schuh and Schwartz, 10♂, 15♀ (AMNH). *Grand Co.*: E of Moab, Colorado River bridge, May 26, 1979, J. T. and D. A. Polhemus, 5♂, 7♀ (JTP). *San Juan Co.*: 25 mi N of Monticello on Rt. 191, 5700 ft, July 18, 1986, R. T. Schuh, *Sarcobatus vermiculatus* (Chenopodiaceae), 2♀ (AMNH). *Sevier Co.*: Richfield, July 15, 1929, E. W. Davis, 7♂, 3♀ (USNM). Salina, July 2, 1943, G. F. Knowlton, 2♂ (KU). *Uintah Co.*: 5–10 mi SE of Bonanza, 5000–5600 ft, May 14, 1982–September 6, 1982, M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 11♂, 16♀ (AMNH). Bonanza, at White River Shale Project Trailers, T9S R24E Sec 23, 5800 ft, May 6, 1982–July 7, 1981, M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 7♂, 64♀ (AMNH). *Weber Co.*: Slaterville, July 12, 1967, G. F. Knowlton and L. E. Frank, 1♂ (OSU). **Washington**: *Yakima Co.*: Yakima, August 15, 1931, A.

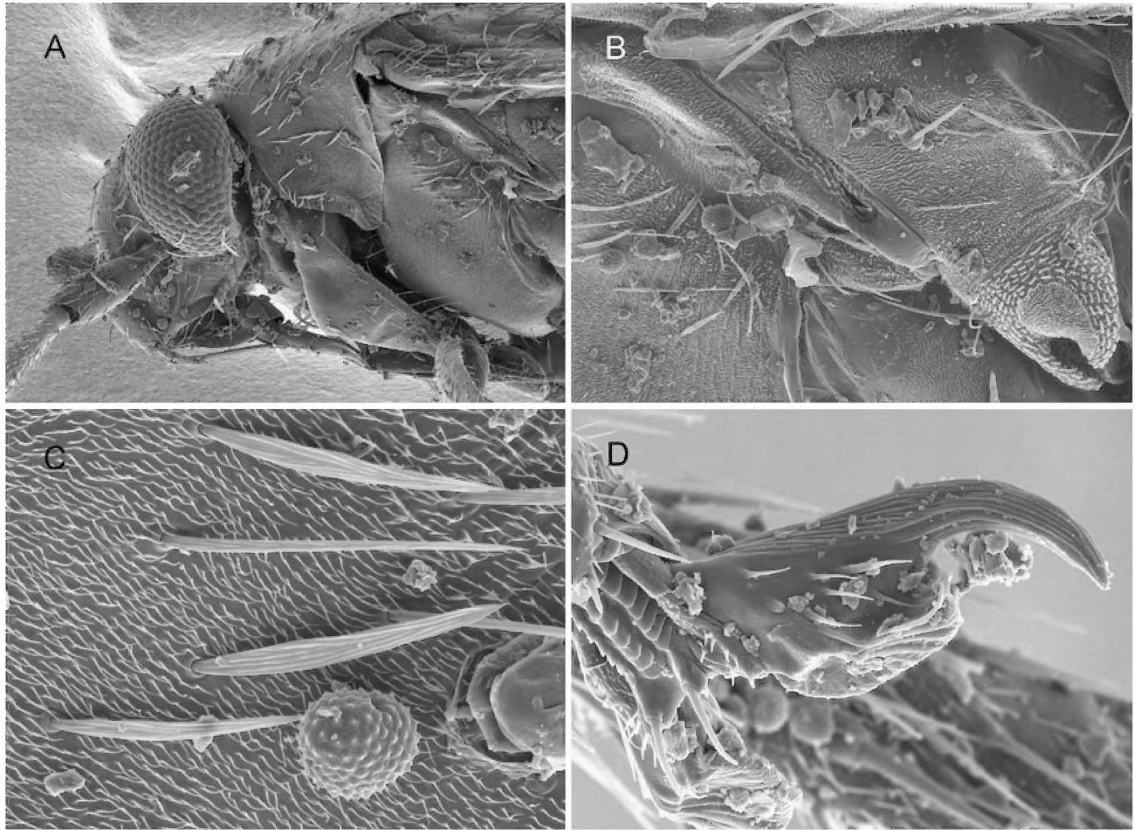


Fig. 1. *Megalopsallus brendae*, male, scanning micrographs. **A.** Lateral view of head and thorax. **B.** Mesothoracic spiracle and metathoracic scent gland evaporatory area. **C.** Detail of setae comprising dorsal vestiture. **D.** Lateral view of pretarsus.

R. Rolfs, 11♂, 10♀ (USNM). Yakima, June 30, 1932, A. R. Rolfs, 10♂, 8♀ (USNM). **Wyoming:** *Sheridan Co.:* Arvada, July 31, 1927, H. H. Knight, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♂, 2♀ (USNM).

Megalopsallus brendae, new species

Figures 1, 7, 13

HOLOTYPE: Male, California: San Bernardino Co.: 1.3 mi. S of Goffs, 845 meters, May 16, 1978, R. T. Schuh, ex ? *Chenopodium* sp. (Chenopodiaceae). Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by generally pale greenish coloration of dorsum contrasting with dark antennal segment 1; possibly most easily confused with *sarcobati* on basis of pale green coloration; differing from that species in having antennal segment 1 dark and venter darkened in males. Vesica in male

somewhat heavier and more nearly forming a coil than in most other *Megalopsallus* species (fig. 13).

DESCRIPTION: Male: Relatively small, total length 2.74–3.16, length apex clypeus–cuneal fracture 2.74–3.16, width across pronotum 0.90–1.01. **COLORATION:** Generally pale with a greenish tinge (fig. 7); eyes, transverse line on frons at level of base of clypeus, maxillary plate, antennal segment 1 (except base and apex), thoracic pleuron and venter, and abdomen including genital capsule brownish black; femora with dark spots, tibial spines black with dark bases. **SURFACE AND VESTITURE:** Dorsum weakly polished and moderately shining, covered with dark, recumbent, simple setae intermixed with silvery, weakly flattened setae (fig. 1C); tibial spines black with black bases. **STRUCTURE:** Moderately elongate and par-

allel-sided; head strongly declivent (fig. 1A); labium relatively short, reaching about mid-way between fore and middle trochanters; claws broad basally, curving near apex, pulvilli small (fig. 1D). MALE GENITALIA: Vesica rather strongly coiled and stout (fig. 13), not attenuated apically; gonopore well developed, weakly subapical; gonopore sclerotized, distinctly sclerotized (fig. 13).

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

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

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

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

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

PARATYPES: USA. — **Arizona**: *Maricopa Co.*: Phoenix, Arizona Canal at McDowell Rd, April 19, 1982, D. A. and J. T. Polhemus, 4♂, 8♀ (JTP). **California**: *Riverside Co.*: Thousand Palms, November 24, 1955, W. R. Richards, 1♂, (CNC). *San Bernardino Co.*: 1.3 mi S of Goffs, 845 m, May 16, 1978, R. T. Schuh, *Chenopodium* sp. (Chenopodiaceae), 65♂, 49♀ (AMNH, USNM). 26.7 mi S of Barstow, St. Rt. 247, 1000 m, May 2, 1985, R. T. Schuh and B. M. Massie, *Lycium cooperi* (Solanaceae), 10♂, 1♀ (AMNH). **Nevada**: *Clark Co.*: Valley of Fire State Park, west entrance, 845 m, May 17, 1978, R. T. Schuh, 9♂, 21♀ (AMNH).

Megalopsallus brittoni Knight

Figures 7, 13

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

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

NEW SYNONYMY.

DIAGNOSIS: Most similar to *femoralis* in

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

REDESCRIPTION: *Male*: Medium sized, total length 3.57–3.82, length apex clypeus–cuneal fracture 2.58–2.71, width across pronotum 1.18–1.29. COLORATION: General coloration, including legs, reddish brown, with some more strongly reddish spots or markings, particularly on head and anterior half of pronotum; eyes distinctly reddish; bases of setae on dorsum often with darkened spots at bases; tibial spines pale with brown bases not strongly contrasting with remainder of tibia. SURFACE AND VESTITURE: Entire body surface dull, matte; dorsum with dark simple setae intermixed with woolly, silvery setae. STRUCTURE: Relatively broad, hemelytra not conspicuously elongate; eyes protuberant; labium long, reaching posterior margin of hind trochanters; tarsal claws elongate, slender, curving, pulvilli very small. MALE GENITALIA: Vesica S-shaped; gonopore subapical; gonopore sclerite not developed (fig. 13).

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

HOST: Unknown.

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

DISCUSSION: Knight (1927) described *brittoni* and *adustus* on the same page, separating them primarily on the length of the second antennal segment. Although this measurement was frequently used by Knight to discriminate species, I have found it to be less reliable than was believed by Knight, owing to variability within species. I have seen only two specimens of *brittoni*, and have compared them with large numbers of specimens from Texas, including the holotype of *adustus* from Anahuac, that agree closely with Knight's concept of *adustus*. I

am treating *adustus* as a junior synonym of *brittoni* because both nominal taxa have brown spots at the bases of many of the setae on the dorsum, an attribute found elsewhere in *Megalopsallus* only in *punctatus*, the last species otherwise showing little similarity to *brittoni*.

SPECIMENS EXAMINED: USA. — **Connecticut:** Stratford, July 9, 1920, B. H. Walden, 1 ♀ (USNM). Westville, July 4, 1904, W. E. Britton, holotype: male of *brittoni* (USNM). **Texas:** *Brazos Co.:* Bryan, April 8, 1965, J. C. Schaffner, 1 ♀ (TAMU). *Cameron Co.:* 4 mi ESE of Brownsville, October 20, 1997, W. F. Chamberlain, 1 ♂, 1 ♀ (TAMU). Brownsville, Boca Chica, December 27, 1945, R. H. Beamer, 3 ♂, 2 ♀ (KU). *Chambers Co.:* Anahuac, October 8, 1918, H. S. Barber, 3 ♀ (USNM); holotype: male of *adustus* (USNM). *Galveston Co.:* Galveston, February 2, 1932, L. D. Tuthill, 2 ♂, 1 ♀ (KU). *Nueces Co.:* Corpus Christi, January 1, 1946, R. H. Beamer, 14 ♂, 35 ♀ (KU, AMNH).

Megalopsallus californicus, new species

Figures 7, 13

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

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

DESCRIPTION: *Male:* Relatively small, total length 2.78–3.10, length apex clypeus–cuneal fracture 1.88–2.12, width across pronotum 0.94–1.03. COLORATION: Pale, weakly greenish; eyes red; membrane of hemelytra generally pale, marmorate posterior to cells (fig. 7); femora with some brown spots; tibial spines pale, with at most medium brown bases. SURFACE AND VESTITURE: Dorsum with brown, recumbent, simple setae intermixed with woolly, silvery setae. STRUCTURE: Elongate ovoid; labium long, surpassing posterior margin of hind trochanters; claws elongate, curving, pulvilli small. MALE GENITALIA: Vesica S-shaped, attenuated apically; gonopore relatively small,

subapical; gonopore sclerite not developed (fig. 13).

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

ETYMOLOGY: Named for its occurrence in California.

HOST: Unknown.

DISTRIBUTION: Southern San Joaquin Valley, California.

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

Megalopsallus ephedrae (Knight),
new combination

Figures 8, 14

Merinocapsus ephedrae Knight, 1968: 34 (n. sp.);
Schuh, 1986: 218 (diag., distr., figs.).

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

REDESCRIPTION: *Male:* Medium sized, total length 3.41–4.32, length apex clypeus–cuneal fracture 2.24–2.81, width across pronotum 0.95–1.14. COLORATION: Head, pronotum, and scutellum dull, usually castaneous to nearly black, sometimes orange; hemelytra ranging from pale to intensely red orange or red, cuneus always orange to red, membrane smoky, veins orange (fig. 8); eyes dark, often mostly black; underside of body usually dark, castaneous; antennae dark; legs of similar coloration to underside of body, tibiae sometimes lighter and tibial spines with visible small dark bases; appendages and underside of body orange in specimens with completely orange dorsum. SURFACE AND VESTITURE: Head, pronotum, and scutellum smooth, dull, clothed with recum-

bent, dark, simple setae intermixed with woolly, silvery setae. STRUCTURE: Elongate, parallel-sided; specimens in some populations relatively longer than those in others; head strongly declivent (fig. 3); labium reaching to about apex of middle coxae; claws moderately elongate, smoothly curving; pulvilli small. MALE GENITALIA: Vesica elongate, twisted, with bifid apex, secondary gonopore subapical with a weakly sclerotized gonopore sclerite (fig. 14).

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

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

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

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

SPECIMENS EXAMINED: MEXICO. — **Baja California Norte**: 6 mi E of Ojos Negros, June 9, 1980, Brown and Faulkner, 1♀ (SDNH). 12 mi E of El Rosario, March 25, 1979, J. D. Pinto, *Ephedra* sp. (Ephedraceae), 7♂, 5♀ (AMNH, UCR). USA. — **California**: *Inyo Co.*: 2 mi E of Westgard Pass summit, White Mountains, 2125 m, July 2, 1980, R. T. Schuh, *Ephedra nevadensis* (Ephedraceae), 6♀ (AMNH). Inyo Mts, May 25, 1937, D. Little, 1♀ (LACM). Rt 95 at North edge of Mono Lake, 2188 m, July 11, 1980, R. T. Schuh and G. M. Stonedahl, *Ephedra* sp. (Ephedraceae), 3♂, 7♀ (AMNH). Tuttle Creek, 2 mi SW of Lone Pine, May 9, 1969, P.A. Opler, 1♂ (UCB). *Mono Co.*: 2 airline mi S of Inyo, 8500 ft, June 27, 1961, J. Powell, *Ephedra* sp. (Ephedraceae), 4♂, 2♀ (UCB). *Riverside Co.*: ca. 0.8 mi N of jct. Deep Creek and Horsethief Creek, T7S R6E Sec 6, 2960 ft, J. D. Pinto, 1♂ (UCR). *San Bernardino Co.*: Victorville, April 21, 1935, C.E. Norland, 2♀ (LACM). Providence Mountains State Recreation Area, 4300 ft, May 18, 1982, M. D. Schwartz, *Ephedra aspera* (Ephedraceae), 2♂, 6♀ (AMNH). 10 mi W of Lucerne Val-

ley, 905 m, May 13, 1978, J. D. Pinto and R. T. Schuh, *Ephedra* sp. (Ephedraceae), 6♂, 28♀ (AMNH). 23 mi S of Amboy, April 7, 1966, C. W. O'Brien, 5♀ (UCB). *San Diego Co.*: Anza-Borrego Desert State Park, Grapevine Canyon, mp 74 on county Rt 52, April 22, 1980, Russell and Schwartz, 1♂ (AMNH). **Nevada**: *Lincoln Co.*: 5 mi NE of jct. of Rts 38 and 93, 2500 ft, May 19, 1982, M. D. Schwartz, *Ephedra nevadensis* (Ephedraceae), 26♂, 18♀ (AMNH). *Nye Co.*: Northumberland Canyon Rd, Toquima Mts, 15 mi E of Rt 376, T31N R45E Secs 3, 4, 10, 7000 ft, June 29, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra* sp. (Ephedraceae), 17♂, 27♀ (AMNH). Mercury, 17 M, June 12, 1965, H. Knight and J. Merino, *Ephedra nevadensis* (Ephedraceae), Paratypes: 3♂, 6♀ (CNC, USNM). 1 mi NE of Belmont on Rt. 82, 2281 m, July 13, 1980, R. T. Schuh and G. M. Stonedahl, *Ephedra* sp. (Ephedraceae), 7♂, 16♀ (AMNH). Mercury, 19 M, June 23, 1965, H. Knight, J. Merino, *Ephedra nevadensis* (Ephedraceae), 3♀ (USNM). Mercury, TM, June 14, 1965, Beck, Knight, Merino, *Ephedra nevadensis* (Ephedraceae), 9♀ (USNM); holotype: male (USNM). **Utah**: *Garfield Co.*: 14.3 mi S of Rt. 95 on Rt. 276 (2.4 mi N of Star Springs turnoff), 5000 ft, June 19, 1983, R. T. Schuh and M. D. Schwartz, 1♂ (AMNH). Capitol Reef Natl. Park, Grand Wash-Cohab Canyon Trail, 5350–6640 ft, June 21, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra viridis* (Ephedraceae), 2♂, 4♀ (AMNH). *Washington Co.*: Rt 15 about 10 mi W of I-15 toward Zion Natl. Park, 1095 m, May 18, 1978, R. T. Schuh, *Ephedra* sp. (Ephedraceae), 3♀ (AMNH).

Megalopsallus ephedrellus, new species

Figures 8, 13

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

DIAGNOSIS: Recognized by pale orange coloration of head, thorax, and hemelytra anterior to apex of scutellum, and dirty greenish coloration posterior to that point; abdomen bright pale green. Size and form of sexual dimorphism similar to *nuperus*, but that

species never with greenish on the hemelytra. Breeds on *Ephedra*.

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

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

ETYMOLOGY: Named for the host genus *Ephedra*.

HOST: *Ephedra* sp. (Ephedraceae).

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

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

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

Megalopsallus femoralis Kelton

Figures 7, 13

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

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

lacking marmorate membrane. Similar in coloration to *brittoni* but smaller.

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

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

HOST: *Salicornia rubra* (Chenopodiaceae).

DISTRIBUTION: Western Great Plains from Alberta south to Colorado.

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

SPECIMENS EXAMINED: CANADA. — **Alberta:** Brooks, August 20, 1957, A. R. and J. E. Brooks, Paratypes: 1♂ (CNC). Lethbridge, June 18, 1939, R. W. Salt, 1♀ (CNC). **Manitoba:** Red Deer River, August 3, 1937, C. L. Johnston, 1♂ (KU). **Saskatchewan:** Dana, July 25, 1959, A. R. Brooks, Paratypes: 5♂, (CNC). Elbow, June 3–June 26, 1960, A. R. Brooks, Paratypes: 11♂ (CNC). Elstow, July 11, 1951–August 29, 1953, A. R. Brooks, L. A. Konotopetz, *Salicornia rubra* (Chenopodiaceae), Holotype and Paratypes: 17♂, 14♀ (CNC). USA. — **Colorado:**

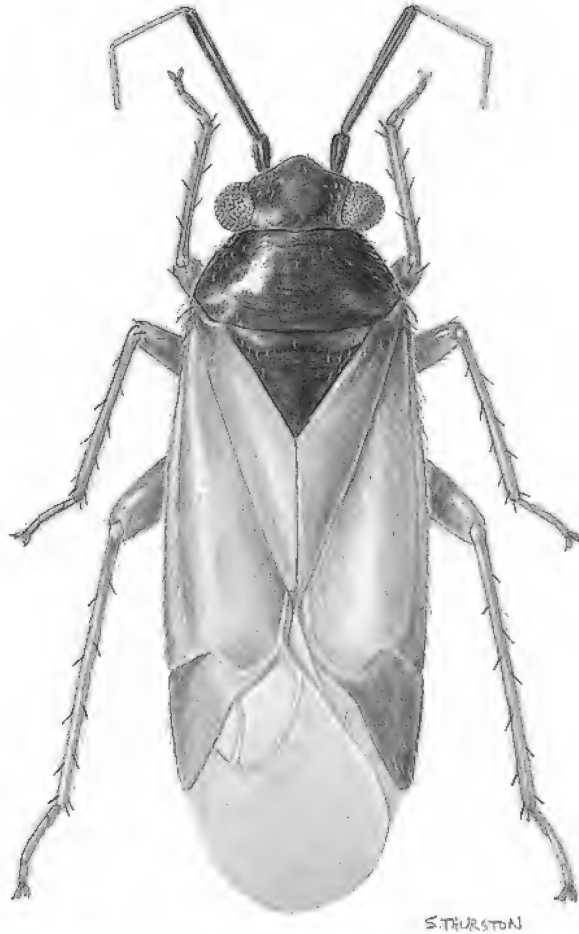


Fig. 2. Habitus of *Megalopsallus flammeus*, male (Nevada, Nye Co., 35 mi N of Tonapah, Coyote Hole Spring/Sevier Reservoir).

Jackson Co.: 7 mi NE of Rand, August 16, 1969, J. C. Schaffner, 1♂ (TAMU). **South Dakota:** *Campbell Co.*: Mound City, July 16, 1938, H. C. Severin, 1♂, 4♀ (USNM). **Wyoming:** *Carbon Co.*: 8 mi W of Rawlins, September 26, 1966, C. W. O'Brien, 1♂, 2♀ (UCB). *Lincoln Co.*: 4 mi NW of Frontier, June 26, 1966, W. Gagne, J. Haddock, 1♂ (UCB).

***Megalopsallus flammeus*, new species**

Figures 2, 7, 14

HOLOTYPE: Male, Nevada: Nye Co., 5 mi. W of Berlin Ichthyosaur St. Monument on Rt. 844, el. 6350 feet, July 1, 1983, R. T. Schuh, M. D. Schwartz, *Sarcobatus vermiculatus* (Hook.) Torr. var. *baileyi* (Cov.) Jeps.

(Chenopodiaceae). Deposited in the American Museum of Natural History.

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

DESCRIPTION: *Male:* Moderately small, total length 3.08–3.34, length apex clypeus–cuneal fracture 2.02–2.08, width across pronotum 0.96–1.01. **COLORATION:** General coloration bright red (fig. 7), including legs (except tarsi); pronotum, scutellum, and underside often tending toward black; eyes blackish; membrane smoky with red veins; tibial spines black but without contrasting dark bases. **SURFACE AND VESTITURE:** Body surface smooth, weakly shining; dorsum with recumbent, brown, simple setae in-

termixed with silvery woolly setae. STRUCTURE: Conspicuously elongate, nearly parallel-sided (figs. 2, 7); labium reaching to hind trochanters; claws relatively short and stout, curving only near apex, pulvilli large, extending to apex of claw, apparently adnate to claw over entire length. MALE GENITALIA: Vesica strongly bent at about mid-point; gonopore large, nearly apical; gonopore sclerite long, well sclerotized (fig. 14).

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

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

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

DISTRIBUTION: Central Nevada.

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

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

PARATYPES: USA. — **Nevada**: *Lyon Co.*: Weeks, May 29, 1967, C. W. O'Brien, *Sarcobatus vermiculatus* (Chenopodiaceae), 3♂, 6♀ (UCB). *Nye Co.*: 2 mi E of Tonapah, June 7, 1966, W. Gagne, 1♂, (UCB). 35 mi

N of Tonapah, Coyote Hole Spring/Sevier Reservoir, T8 R42E S11 & 23, 6000 ft, June 30, 1983, Schuh and Schwartz, *Sarcobatus vermiculatus* var. *baileyi* (Chenopodiaceae), 35♂, 142♀ (AMNH, USNM). 5 mi W of Berlin Ichthyosaur State Monument on Rt. 844, 6350 ft, July 1, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* var. *baileyi* (Chenopodiaceae), 35♂, 83♀ (AMNH, USNM). Northumberland Canyon Rd, Toquima Mts, T14N R44E Sec. 31, 6400 ft, June 28, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* var. *baileyi* (Chenopodiaceae), 7♂, 28♀ (AMNH). *Washoe Co.*: Verdi, July 9, 1967, Gagne, 1♀ (UCB).

Megalopsallus froeschneri (Schuh),
new combination

Figures 8, 14

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

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

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

apex of middle coxae; claws elongate, smoothly curving, pulvilli small. MALE GENITALIA: Vesica of moderate length, S-shaped, apex bifid with short projections, secondary gonopore removed from apex by distance equal to length of gonopore, gonopore sclerite very small (fig. 14).

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

HOSTS: *Ephedra cutleri*, *E. nevadensis*, *E. torreyana*, *E. viridis* (Ephedraceae).

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

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

SPECIMENS EXAMINED: USA. — **California**: *Inyo Co.*: 2 mi E of Westgard Pass summit, White Mountains, 2125 m, July 2, 1980, R. T. Schuh, Paratypes: 7♂, 12♀ (AMNH); holotype: male (AMNH). *Kern Co.*: 20 mi NW of Mojave on Hiway 58, June 13, 1983, G. M. Stonedahl, *Ephedra nevadensis* (Ephedraceae), Paratypes: 1♂, 4♀ (AMNH). *Los Angeles Co.*: Tehachapi Pass, June 6, 1929, R. L. Usinger, 5♀ (UCB). Little Rock, Mojave Desert, May 20, 1937, E. P. Van Duzee, Paratypes: 1♂ (CAS). Mint Canyon, May 17, 1937, E. P. Van Duzee, *Astragalus* sp. 1♀ (CAS). *Mono Co.*: Benton Hot Springs, June 8, 1966, W. Gagne, 3♀ (UCB). *San Bernardino Co.*: Yucca Valley, 6.3 mi N on Old Woman Springs Rd, May 13, 1978, J. D. Pinto, *Ephedra* sp. (Ephedraceae), Paratypes: 1♂, 1♀ (UCR). 10 mi N of Yucca Valley, May 28, 1975, J. D. Pinto, *Ephedra* sp. (Ephedraceae), 1♀ (UCR). Providence Mountains State Recreation Area, 4300 ft, May 18, 1982, M. D. Schwartz, *Ephedra viridis* (Ephedraceae), Paratypes: 3♂ (AMNH). **Nevada**: *Lincoln Co.*: 5 mi NE of jct. Rts 38 and 93, 2500 ft, May 19, 1982, M. D. Schwartz, *Ephedra nevadensis* (Ephedraceae), Paratypes: 3♂, (AMNH). *Nye Co.*: Atomic Test Site, Mercury Hiway at Angle Road (A3), 3800 ft, June 8, 1983, Schuh, Schwartz, Stonedahl, *Ephedra nevadensis* (Ephedraceae), Paratypes: 11♂, 28♀

(AMNH). Atomic Test Site, 1mi S of Cane Springs Road at GS 250 (A5), 4100 ft, June 8, 1983, Schuh, Schwartz, Stonedahl, *Ephedra nevadensis* (Ephedraceae), Paratypes: 1♂, 1♀ (AMNH). Mercury, 18 M, June 7, 1965, E. Beck, J. Merino, *Ephedra nevadensis* (Ephedraceae), 1♀ (USNM). Mercury, 40M, June 20, 1965, H. Knight, J. Merino, *Ephedra nevadensis* (Ephedraceae), 3♀ (USNM). Mercury, 6M, June 15, 1965, H. Knight, J. Merino, *Ephedra nevadensis* (Ephedraceae), 2♀ (USNM). Mercury, CM, June 13, 1965, E. Beck, H. Knight, J. Merino, *Ephedra nevadensis* (Ephedraceae), 2♀ (CNC, USNM). Mercury, CU, June 13, 1965, Beck, Knight, Merino, 4♀ (USNM). Mercury, TM, June 14, 1965, E. Beck, H. Knight, J. Merino, *Ephedra nevadensis* (Ephedraceae), 3♀ (USNM). Northumberland Canyon Rd, Toquima Mts, T14N R44E Sec. 31, 6400 ft, June 28, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra* sp. (Ephedraceae), Paratypes: 4♂, 6♀ (AMNH). 5 mi E of Gabbs off Rt. 844, 5800 ft, July 1, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra* sp. (Ephedraceae), Paratypes: 1♂, 6♀ (AMNH). **New Mexico**: *San Juan Co.*: Angel Peak Campground, June 4, 1977, Hanson and Knowlton, 1♂, 2♀ (CNC). *Utah*: *Emery Co.*: 2.4 mi W of Rt. 24 on Goblin Valley Rd, 5500 ft, June 19, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra cutleri* (Ephedraceae), Paratypes: 1♂ (AMNH). *Grand Co.*: 11 mi SE of jct. Rts 313 & 163 toward Dead Horse Point, 5200 ft, June 11, 1982, M. D. Schwartz, *Ephedra viridis* (Ephedraceae), Paratypes: 13♂, 35♀ (AMNH). *San Juan Co.*: Goosenecks Overlook, 5000 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra torreyana* (Ephedraceae), Paratypes: 4♂, 1♀ (AMNH). Rt. 63 at Arizona border, Monument Valley, 5200 ft, June 16, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra cutleri* (Ephedraceae), Paratypes: 13♂, 53♀ (AMNH). Grand Flat near Collins Canyon, 5600 ft, May 28, 1978, D. A. and J. T. Polhemus, Paratypes: 4♂, 5♀ (JTP). Glen Canyon Recreation Area, 12 mi S of Rt. 263, T40S R14E, 4300 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, Paratypes: 1♂ (AMNH). 7.7 mi N of Mexican Hat on Rt 261, T41S R18E, 5000 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra*

sp. (Ephedraceae), 1 ♀ (AMNH). 2.7 mi W of Rt. 95 on Rt. 263, T37S R17E, 6000 ft, June 18, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra torreyana* (Ephedraceae), Paratypes: 2 ♂ (AMNH). Head of Lake Canyon near Nokai Dome Road, 4200 ft, May 29, 1978, D. A. and J. T. Polhemus, Paratypes: 1 ♂, 1 ♀ (JTP). Washington Co.: 2 mi NW of Toquerville on Rt 17, 3800 ft, May 25, 1981, M. D. Schwartz, *Ephedra viridis* (Ephedraceae), 1 ♀ (AMNH).

Megalopsallus humeralis (Van Duzee)

Figures 3, 9, 14

Sthenarus humeralis Van Duzee, 1923: 162 (n. sp.).

Europiella humeralis: Knight, 1968: 41 (n. comb., host).

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

Megalopsallus arizonae Knight, 1968: 45 (n. sp.). NEW SYNONYMY.

Europiella balli Knight, 1968: 44 (n. sp.). NEW SYNONYMY.

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

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

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

Europiella lycii Knight, 1968: 40 (n. sp.). NEW SYNONYMY.

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

Europiella rufiventris Knight, 1968: 42 (n. sp.). NEW SYNONYMY.

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

Europiella viridiventris Knight, 1968: 42 (n. sp.). NEW SYNONYMY.

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

DIAGNOSIS: Recognized by frequently dark coloration of most of dorsum and femora, or at least dark coloration of head, pronotum, scutellum, and femora, with pale hemelytra. Most easily confused with *nigrofemoratus* on basis of size, coloration, and type of sexual dimorphism; separated most easily by differences in structure of male genitalia, vesica being more elongate and slender in *nigrofemoratus* than in *humeralis*, and fact that *nigrofemoratus* feeds on *Atriplex* and *Grayia* (Chenopodiaceae) rather than *Lycium* (Sola-

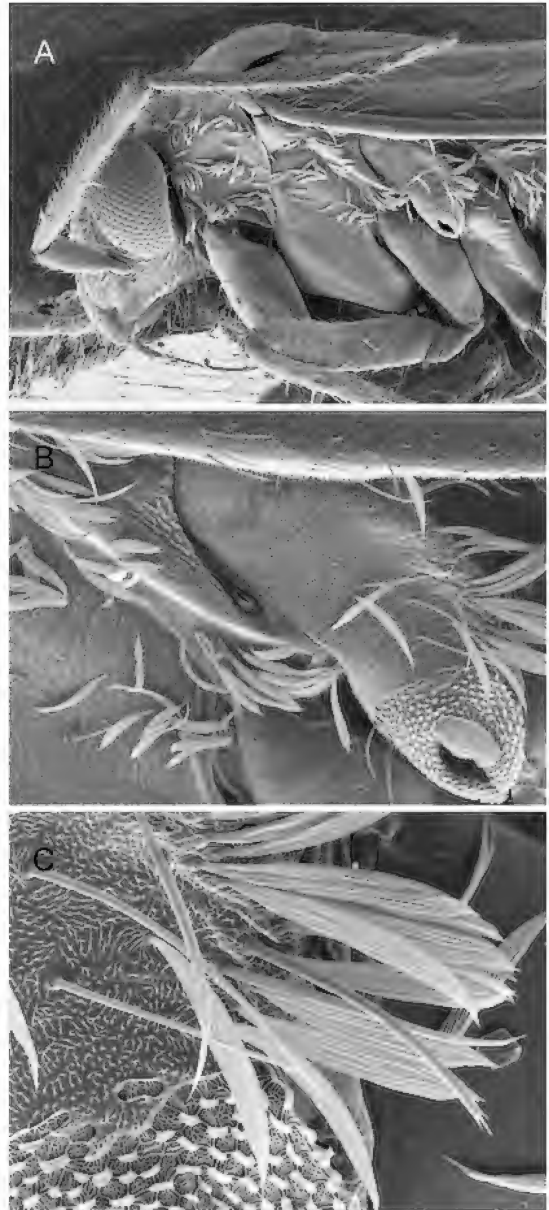


Fig. 3. *Megalopsallus humeralis*, male, scanning micrographs. A. Lateral view of head and thorax. B. Mesothoracic spiracle and metathoracic scent gland evaporatory area. C. Detail of setae on thoracic pleuron.

naceae), the latter appearing as exclusive host of *humeralis*. Pale specimens separated from *Lycium*-feeding *nicholi* by cuneus being unicolorous with corium, rather than of at least moderately contrasting coloration as in *nicholi*.

REDESCRIPTION: *Male*: Small to medium sized, total length 2.57–3.63, length apex clypeus–cuneal fracture 1.74–2.31, width across pronotum 0.94–1.11. COLORATION: Dorsum varying from largely deep brown to nearly entirely pale brown, often with head, pronotum, and scutellum dark, hemelytra somewhat lighter to much lighter (fig. 9); eyes blackish; underside mostly dark in dark specimens, abdomen often pale green in lighter specimens; antennae usually reddish, sometimes almost entirely pale, or brownish; femora dark or darkened, tibiae pale, tibial spines dark with dark bases. SURFACE AND VESTITURE: Dorsum smooth, very weakly shining, clothed with recumbent, dark, simple setae intermixed with woolly, silvery setae (figs. 3, 9). STRUCTURE: Weakly to strongly elongate, parallel-sided; specimens in some populations longer than those in others (fig. 9); head strongly declivent (fig. 3); labium reaching onto, but not beyond, hind trochanters; claws relatively short and straight, curving sharply near apex; pulvilli large, adnate to nearly entire ventral surface of claw. MALE GENITALIA: Vesica forming a weak coil, apex not attenuated, gonopore apical; gonopore sclerite well developed (fig. 14).

Female: Total length 2.48–3.30, length apex clypeus–cuneal fracture 1.83–2.19, width across pronotum 0.97–1.16; ovoid; not showing the nonoverlapping size variation seen in males (fig. 9).

HOSTS: *Lycium andersonii*, *L. berlandieri*, *L. b. parviflorus*, *L. cooperi*, *L. fremontii*, *L. parishii*, *L. sp.* (Solanaceae). Probable sitting records: *Ambrosia dumosa* (Asteraceae); *Larrea divaricata* (Zygophyllaceae); *Prosopis juliflora* (Fabaceae); *Rhamnus sp.* (Rhamnaceae). Frequently collected when the plants are in fruit.

DISTRIBUTION: Sonora and Baja California, Mexico north as far as southern Utah in interior western North America.

DISCUSSION: Knight (1968) described the new species *arizonae*, *balli*, *brevicornis*, *lycii*, *rufiventris*, and *viridiventris* from the southwestern United States. Comparison of the types and other specimens examined by Knight with holotype of *Megalopsallus humeralis* (Van Duzee) ["Loreto, Baja California, May 20, 1921, EP Van Duzee Collec-

tor," male (CAS)], including dissections of the male genitalia of most of these nominal species, indicates that even though there is substantial variation in color and size, the male genitalia are very similar for all of them and distinct from all other species of *Megalopsallus*. I am therefore treating all of these nominal taxa as synonymous, *humeralis* having priority. The holotype and paratypes of *humeralis* are faded, like many other Van Duzee specimens, appearing somewhat lighter in color than would be expected of fresh material.

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

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

SPECIMENS EXAMINED: MEXICO. — **Baja California Norte**: 36 mi SE of El Rosario, Rancho El Progreso, March 25, 1979, J. D. Pinto, *Lycium* sp. (Solanaceae), 1♂, 4♀ (UCR). **Baja California Sur**: Loreto, May 20, 1921, E. P. Van Duzee, Paratypes: 2♂, 6♀ (CAS). **Sonora**: 40 mi W of Moctezuma, April 27, 1981, D. A. and J. T. Polhemus, *Rhamnus* sp. (Rhamnaceae), 1♀ (JTP). USA. — **Arizona**: Aztec, February 3, 1941–April 4, 1942, L. L. Stitt, 4♀ (USNM). **Cochise Co.**: Apache Trail, March 27, 1951, B. P. Bliven, 1♂, 4♀ (CAS). **Gila Co.**: 5.5 mi W of Roosevelt Dam at Apache Lake, 1750 ft, May 27, 1983, Schuh, Stonedahl, and Massie, 2♀ (AMNH). Salt River Mts, 1300 ft, May 9, 1926, A. A. Nichol, 1♂ (USNM). **Maricopa Co.**: Gila Bend, 260 m, May 7, 1978, R. T. Schuh, 1♂ (AMNH). Usery Mtn. Park, January 17, 1983, J. T. Polhemus, 15♂, 15♀ (JTP). Tempe, April 8, 1940, L. L. Stitt, Paratypes: 1♂, 2♀ (USNM). 10 mi S of Sun-

flower, April 18, 1982, D. A. and J. T. Polhemus, 2♂, 1♀ (JTP). Sand Tank Mountains, SE of Gila Bend, 935 m, May 8, 1978, R. T. Schuh and A. F. Guenther, *Larrea divaricata* (Zygophyllaceae), 1♀ (AMNH). Sand Tank Mountains, SE of Gila Bend, 900–1000 m, March 24, 1981, R. T. Schuh, *Lycium* sp. (Solanaceae), 2♂, 7♀ (AMNH). Sand Tank Mountains, SE of Gila Bend, 900–1000 m, March 24, 1981, R. T. Schuh, *Lycium parishii* (Solanaceae), 27♂, 54♀ (AMNH). Salt River Canyon at Apache Lake, 2000 ft, April 28, 1981, J. T. Polhemus, 1♂ (JTP). Phoenix, Arizona Canal at McDowell Rd, April 19, 1982, D. A. and J. T. Polhemus, 1♂, 7♀ (JTP). Gila Bend, February 3, 1941–June 1, 1941, L. L. Stitt, Paratypes: 6♂, 7♀ (USNM). Woolsey Wash near Painted Rock Dam, 205 m, April 3, 1981, R. T. Schuh, *Lycium fremontii* (Solanaceae), 8♂, 12♀ (AMNH). 14 mi S of Wickenburg on Vulture Mine Road, 600–700 m, April 1, 1981, R. T. Schuh and M. D. Schwartz, *Lycium andersonii berlandieri* (Solanaceae), 69♂, 68♀ (AMNH). 5 mi S of Freeman SE of Gila Bend, 625 m, May 8, 1978, R. T. Schuh and A. F. Guenther, *Lycium* sp. (Solanaceae), 31♂, 75♀ (AMNH). 14 mi S of Wickenburg on Vulture Mine Road, 600–700 m, April 1, 1981, R. T. Schuh and M. D. Schwartz, *Lycium* sp. nr. *parishii* (Solanaceae), 21♂, 11♀ (AMNH). 14 mi S of Wickenburg on Vulture Mine Road, 600–700 m, April 1, 1981, R. T. Schuh and M. D. Schwartz, *Lycium* sp. (Solanaceae), 6♂, 6♀ (AMNH). 16 mi E of milepost 22 on Rt. 85, Sauceda Mts, 565 m, April 2, 1981, R. T. Schuh, *Lycium* sp. (Solanaceae), 23♂, 30♀ (AMNH). 24 mi E of Gila Bend, Freeman, 530 m, May 8, 1978, R. T. Schuh and A. F. Guenther, 1♂, 3♀ (AMNH). 4 mi S of Wickenburg on Vulture Mine Road, 700 m, April 1, 1981, R. T. Schuh and M. D. Schwartz, *Lycium* sp. nr. *parishii* (Solanaceae), 9♂, 22♀ (AMNH). 5 mi N of Wickenburg on Rt 93, April 29, 1981, D. A. and J. T. Polhemus, 1♀ (JTP). 5 mi S of Freeman SE of Gila Bend, 575 m, March 24, 1981, R. T. Schuh, *Lycium parishii* (Solanaceae), 13♂, 32♀ (AMNH). 1.8 mi W of Roosevelt on Rt. 88, May 10, 1980, J. D. Pinto, *Lycium* sp. (Solanaceae), 5♂, 9♀ (UCR). *Mojave Co.*: 9 mi W of Beaver Creek and Virgin River on US 15, Cedar Pocket Rest Stop, 2600 ft, May 12, 1982, M. D. Schwartz, *Ambrosia dumosa* (Asteraceae), 3♀ (AMNH). *Pima Co.*: Organ Pipe Cactus Natl. Mon., Quitobaquito, April 3, 1966, C. W. O'Brien, 2♂, 4♀ (UCB). Rillito, March 8, 1988, W. A. Jones, *Lycium fremontii* (Solanaceae), 3♂, 5♀ (USNM). Tucson, Santa Catalina Mts, Bear Creek near Saddleback Dr., February 24, 1995, M. D. Schwartz, *Lycium berlandieri* (Solanaceae), 10♂, 11♀ (AMNH). Tucson, April 19, 1926, A. A. Nichol, Paratypes: 2♂, 4♀ (USNM). Tortolito Mts, 2500–3000 ft, April 22, 1982, M. D. Schwartz, *Prosopis juliflora* (Fabaceae), 1♂ (AMNH). Santa Catalina Mts, Finger Rock Canyon Trail, 3000–3500 ft, April 5, 1981, M. D. Schwartz, *Lycium* sp. (Solanaceae), 7♂, 19♀ (AMNH). Organ Pipe Cactus Natl. Mon., Alamo Wash, 700–800 m, March 26, 1981, R. T. Schuh, M. D. Schwartz, *Lycium* sp. (Solanaceae), 45♂, 59♀ (AMNH). Organ Pipe Cactus Natl. Mon., Alamo Wash, 700–800 m, March 26, 1981, R. T. Schuh, M. D. Schwartz, *Lycium parishii* (Solanaceae), 34♂, 80♀ (AMNH). Marana, March 9, 1988, W. A. Jones, *Lycium* sp. (Solanaceae), 5♂, 2♀ (USNM). 7 mi W of Tucson, March 9, 1988, W. A. Jones, 2♂, 4♀ (USNM). 14 mi S of Ajo, April 2, 1966, L. & C. W. O'Brien, 1♂ (UCB). Organ Pipe Cactus Natl. Mon., Alamo Wash, 700–800 m, R. T. Schuh, M. D. Schwartz, *Lycium berlandieri parviflorus* (Solanaceae), 71♂, 94♀ (AMNH). *Pinal Co.*: Sacaton, January 22, 1936, L. L. Stitt, *Lycium* sp. (Solanaceae), Paratype: 1♂, (USNM). *Yavapai Co.*: Coldwater, April 6, 1940, L. L. Stitt, Paratypes: 5♂, 6♀ (USNM). Castle Wash N of Phoenix, March 21, 1980, J. T. Polhemus, 6♀ (JTP). *Yuma Co.*: December 20, 1939, L. L. Stitt, Paratypes: 1♂, 1♀ (USNM). **California**: *Imperial Co.*: 1 mi E of Coyote Wells, April 23, 1980, Schwartz and Russell, 1♀ (AMNH). *Kern Co.*: 7 mi N of Mojave, April 23, 1966, C. W. O'Brien, 2♂, 4♀ (UCB). *Kings Co.*: 8 mi SE of Avenal, April 16, 1966, C. W. O'Brien, 1♂ (UCB). *Los Angeles Co.*: Palmdale, April 14, 1932, E. P. Van Duzee, 14♂, 6♀ (CAS). *Riverside Co.*: Andreas Canyon, Palm Springs, March 11, 1955, W. R. M. Mason, 1♂ (CNC). *San Bernardino Co.*: 1.3 mi S of Goffs, 845 m, May 16, 1978, R. T. Schuh, *Lycium* sp. (Solanaceae), 56♂, 64♀

(AMNH). 10 mi W of Lucerne Valley, 905 m, May 13, 1978, R. T. Schuh and J. D. Pinto, *Lycium* sp. (Solanaceae), 10♂, 16♀ (AMNH). 26.7 mi S of Barstow on Rt. 247, 1000 m, May 2, 1985, R. T. Schuh and B. M. Massie, *Lycium cooperi* (Solanaceae), 3♂ (AMNH). **Nevada:** Clark Co.: 5.8 mi W of Valley of Fire State Park, 845 m, May 17, 1978, R. T. Schuh, 8♂, 8♀ (AMNH). Nye Co.: Atomic Test Site, Jackass Flats Road, 3300 ft, June 6, 1983, Schuh, Schwartz, and Stonedahl, *Lycium andersonii* (Solanaceae), 38♂, 36♀ (AMNH). Mercury, CM, June 12, 1965–June 13, 1965, Knight and Merino, 3♀ (USNM). Atomic Test Site, 2.6 mi W of Mercury Hwy on Cane Springs Road, 3400 ft, June 6, 1983, Schuh, Schwartz, and Stonedahl, *Lycium andersonii* (Solanaceae), 4♂, 5♀ (AMNH). Mercury, 6M, June 15, 1965, Knight and Merino, 3♂ (USNM). Atomic Test Site, Tweezer Rd at Orange Blossom Rd, 4750 ft, June 8, 1983, Schuh, Schwartz, and Stonedahl, *Lycium andersonii* (Solanaceae), 1♀ (AMNH). **Utah:** San Juan Co.: 7.7 mi N of Mexican Hat on Rt. 261, 5000 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, *Lycium andersonii* (Solanaceae), 1♂, 1♀ (AMNH). The Goosenecks Overlook, 5000 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, *Lycium andersonii* (Solanaceae), 1♂, 1♀ (AMNH).

Megalopsallus knowltoni (Knight)

Figures 4, 9, 14

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

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

REDESCRIPTION: *Male:* Large, total length 4.51–5.20, length apex clypeus–cuneal fracture 2.79–3.31, width across pronotum 1.15–

1.32. **COLORATION:** Black or nearly so, including eyes (fig. 9); antennal segments 2, 3, and 4 and tibiae lighter, but always at least weakly infuscate; tibial spines black with obscure dark bases. **SURFACE AND VESTITURE:** Dorsum very faintly rugose, pronotum and scutellum weakly shining, hemelytra appearing dull; dorsum with long, dark, reclining simple setae intermixed with silvery, woolly setae (fig. 4B, C). **STRUCTURE:** Hemelytra extremely elongate, nearly parallel-sided (fig. 9), apex of abdomen reaching only to cuneal fracture; labium just reaching middle trochanters; claws sharply curving near apex, pulvilli about one-half the length of claw, free except at base (fig. 4D). **MALE GENITALIA:** Vesica S-shaped, attenuated apically; gonopore subapical, very weakly sclerotized; gonopore sclerite absent (fig. 14).

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

HOST: *Sarcobatus vermiculatus* (Chenopodiaceae).

DISTRIBUTION: Northern Great Basin.

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

SPECIMENS EXAMINED: USA. — **California:** Modoc Co.: 5 mi SE of Fort Bidwell, Surprise Valley Dunes, June 9, 1970, P. Opler, *Sarcobatus vermiculatus* (Chenopodiaceae), 21♂ (UCB). Mono Co.: 8 mi W of Nevada state line on Rt. 359, 6700 ft, July 2, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 4♂, 8♀ (AMNH). **Idaho:** Oneida Co.: Curlew Reservoir, June 6, 1969, G. F. Knowlton, 1♀ (USNM); 1♀ (USNM). Black Pine, March 31, 1969, G. F. Knowlton, 7♂ (USNM, USU); Paratypes: 1♂, 1♀ (CNC). **Nevada:** Elko Co.: Utah state line on Utah Rt. 30, 4760 ft, June 25, 1983, Schuh and Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♂ (AMNH). Nye Co.: 28 mi N of Belmont on Rt. 82, 2013 m, July 13, 1980, R. T. Schuh, *Sarcobatus vermiculatus* (Chenopodiaceae), 2♂ (AMNH). Washoe Co.: 2 mi E of Vya on Rt. 8A, 1750 m, July 2, 1979, Schuh and Massie, *Sarcobatus vermiculatus* (Chenopodiaceae), 8♂, 12♀

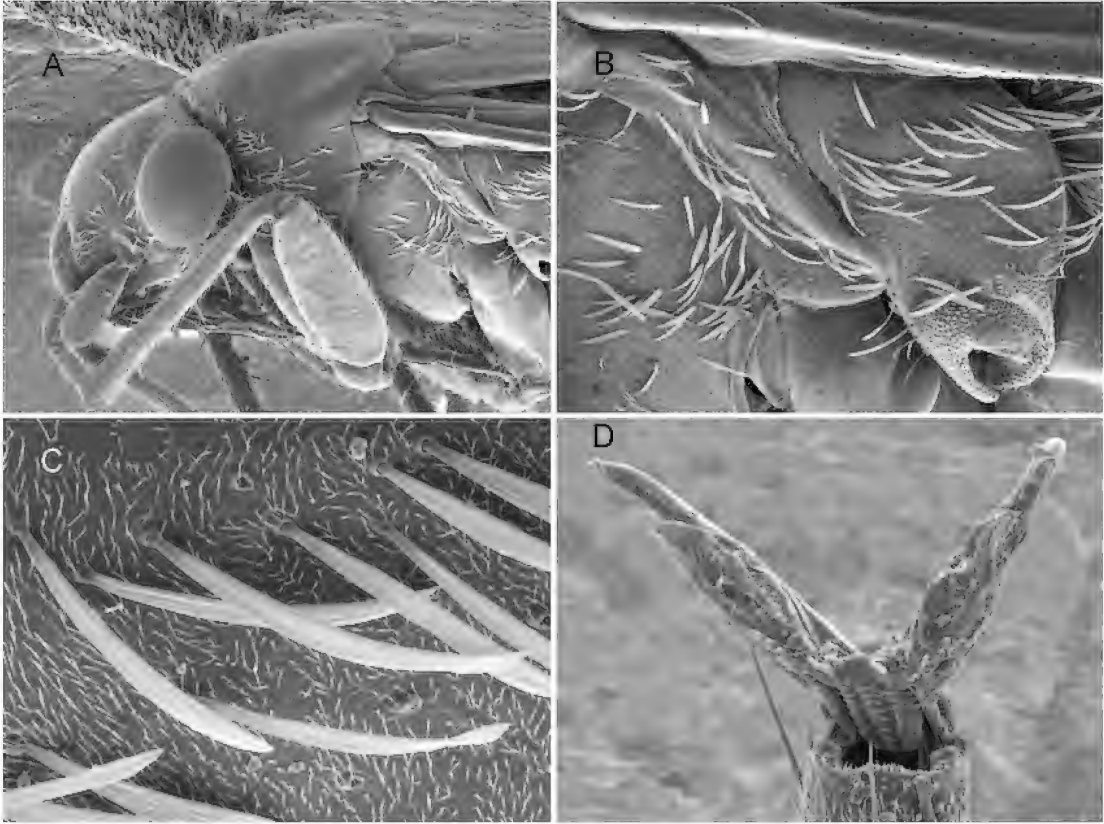


Fig. 4. *Megalopsallus knowltoni*, female, scanning micrographs. **A.** Lateral view of head and thorax. **B.** Mesothoracic spiracle and metathoracic scent gland evaporatory area. **C.** Detail of setae on thoracic pleuron. **D.** Ventral view of pretarsus.

(AMNH). **Oregon:** *Harney Co.:* Alvord Basin, T37S R33E S26, April 29, 1979, Cobb and Lightfoot, *Sarcobatus vermiculatus* (Chenopodiaceae), (OSU). **Utah:** *Box Elder Co.:* Kelton Pass, May 27, 1969, G. F. Knowlton, 1♂ (USNM).

Megalopsallus marmoratus Knight

Figures 9, 15

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

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

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

Female: Total length 2.57–3.01, length



Fig. 5. Habitus of *Megalopsallus nicholi*, male (Mexico, Zacatecas, 13 mi SW of Concepcion del Oro).

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

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

DISTRIBUTION: Arizona, southern California, and Baja California Norte.

SPECIMENS EXAMINED: MEXICO. — **Baja California Norte:** 1 mi S of Bahia de los Angeles, March 26, 1979, J. D. Pinto, *Salicornia* sp. (Chenopodiaceae), 1♂, 1♀ (UCR). USA. — **Arizona:** *Maricopa Co.:* just S of Buckeye, Palo Verde Rd at Rt. 85, 335 m, April 1, 1981, R. T. Schuh and M. D. Schwartz, *Allenrolfea occidentalis*

(Chenopodiaceae), 16♂, 113♀ (AMNH, USNM). *Yuma Co.:* Yuma, April 27, 1939, L. L. Stitt, Paratypes: 2♂, (USNM). Yuma, May 5, 1942, L. L. Stitt, Paratypes: 3♂ (CNC, USNM). **California:** *Imperial Co.:* Holtville, March 13, 1945, Weed, 1♂ (USNM). *Inyo Co.:* Death Valley, Saratoga Springs, March 23, 1957, C. L. Hogue, 1♂ (LACM). Death Valley, Triangle Spa, April 16, 1943, G. Willett, 1♂ (LACM). *Riverside Co.:* Salton Sea, Salt Creek, April 14, 1974, M. Wasbauer, *Salicornia* sp. (Chenopodiaceae), 1♂, 14♀ (CAFA). Salton Sea, Meca, April 9, 1955, W. R. Richards, pickle-bush, 6♂, 6♀ (CNC).

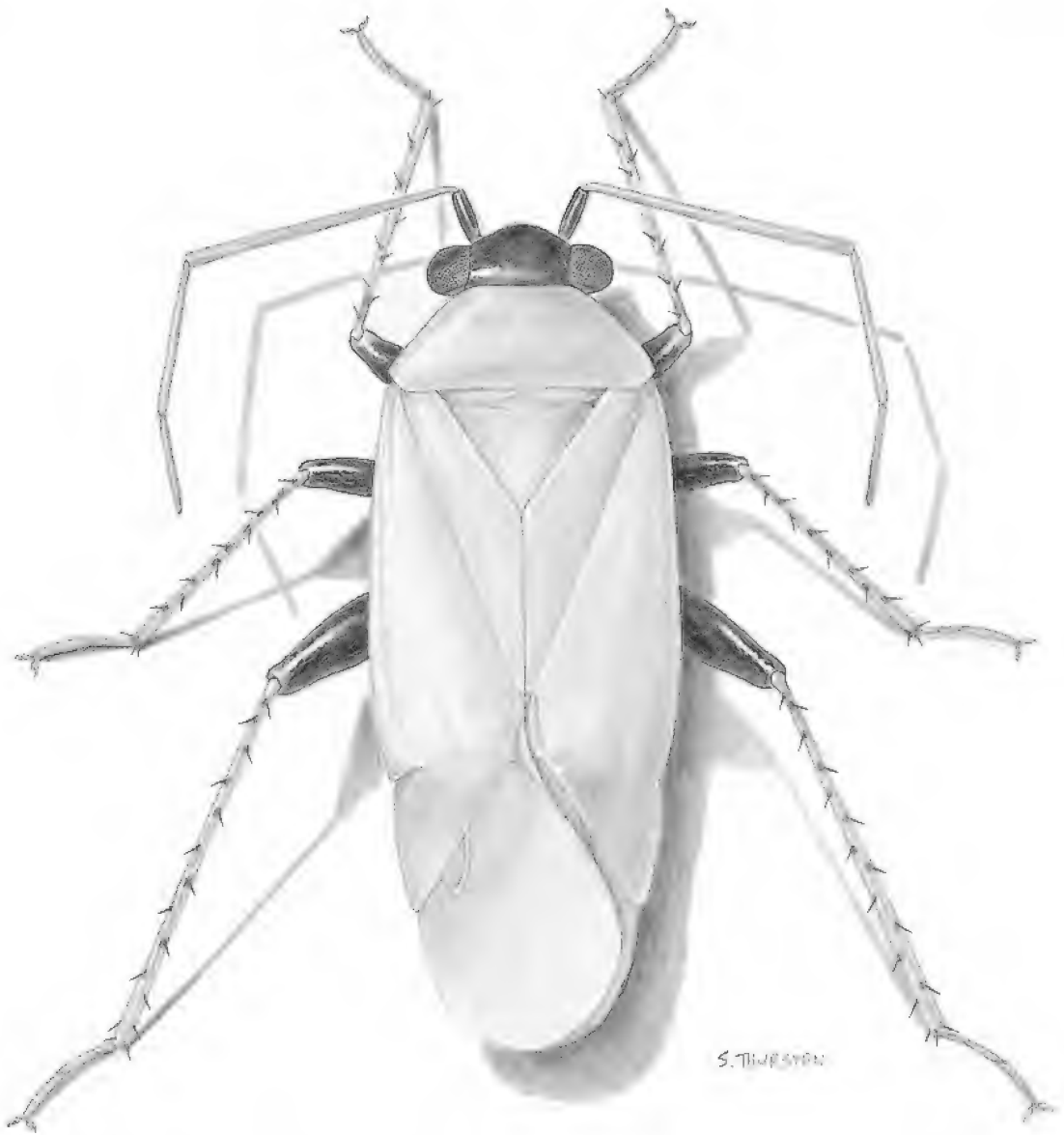


Fig. 6. Habitus of *Megalopsallus nigricaput*, male (Arizona, Graham Co., Stockton Pass, Pinaleno Mts).

Megalopsallus nicholi (Knight)

Figures 5, 9, 15

Europiella nicholi Knight, 1968: 42 (n. sp.).

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

DIAGNOSIS: Recognized by castaneous head, pronotum, and scutellum contrasting with pale corium, clavus, and membrane,

and cuneus always at least weakly darkened and reddish (figs. 5, 9). Most easily confused with pale specimens of *humeralis* (fig. 9), the latter also breeding on *Lycium* spp.; distinguished from *humeralis* by darkened cuneus contrasting with remainder of hemelytra. Genitalia also absolutely distinctive from those of *humeralis*. Also similar in general appearance to *Sarcoba-*

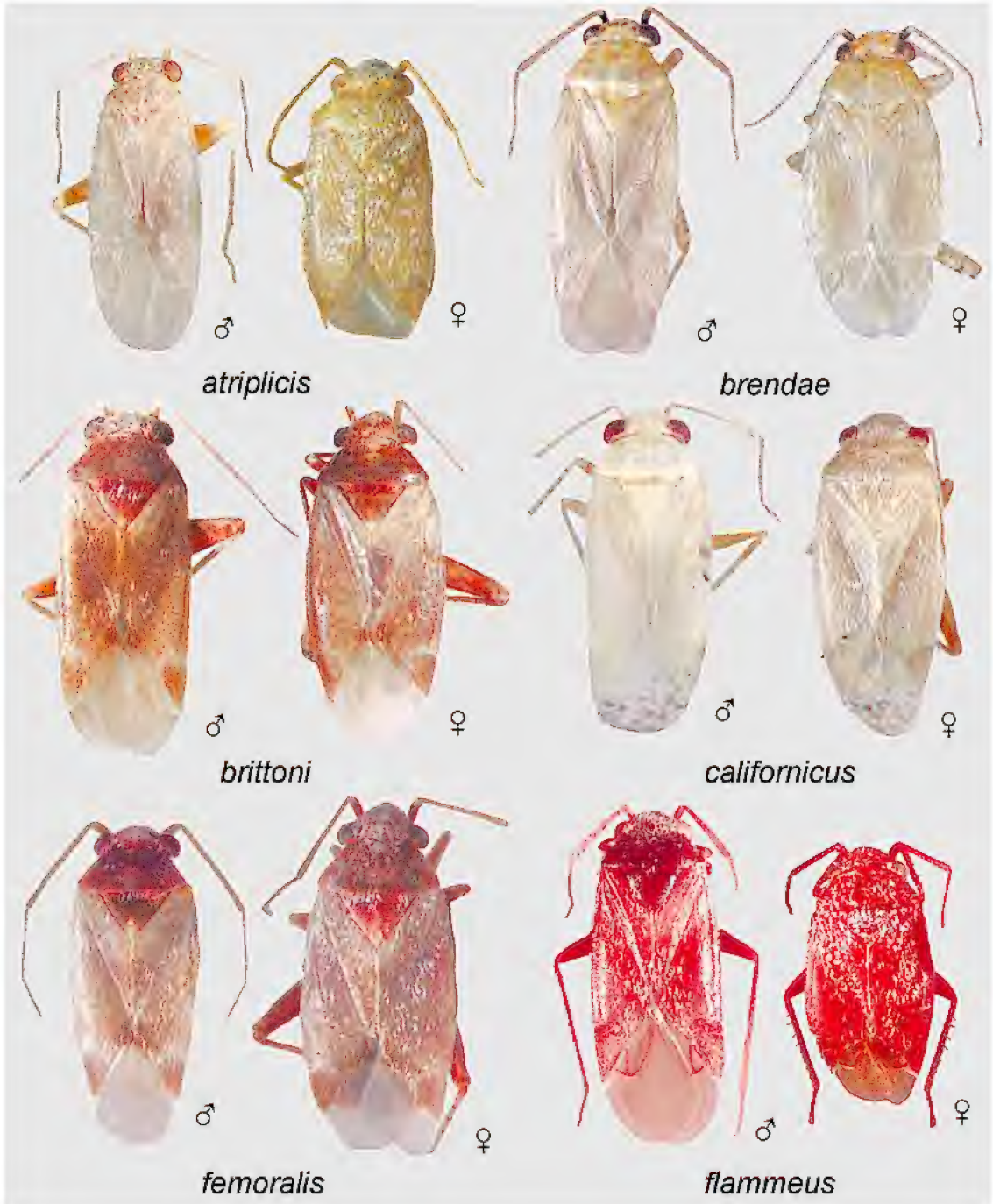


Fig. 7. Habitus photographs of *Megalopsallus* spp. Note that locality data in this and subsequent figures are associated with specimens by moving from left to right, beginning in row 1 and working down the page. *M. atriplicis* (♂: Nevada, Nye Co., 2.5 mi NE of Gabbs, Rifle Range. ♀: Texas, Cameron Co, Brownsville). *M. brendae* (♂: California, San Bernardino Co., 1.3 mi S of Goffs. ♀: Nevada, Clark Co., west entrance to Valley of Fire State Park). *M. brittoni* (♂ and ♀: Texas, Nueces Co, Corpus Christi). *M. californicus* (♂ and ♀: California, Kern Co., Schafer). *M. femoralis* (♂ and ♀: Canada, Saskatchewan, Elstow). *M. flammeus* (♂ and ♀: Nevada, Nye Co., 35 mi N of Tonapah, Coyote Hole Spring/Sevier Reservoir).

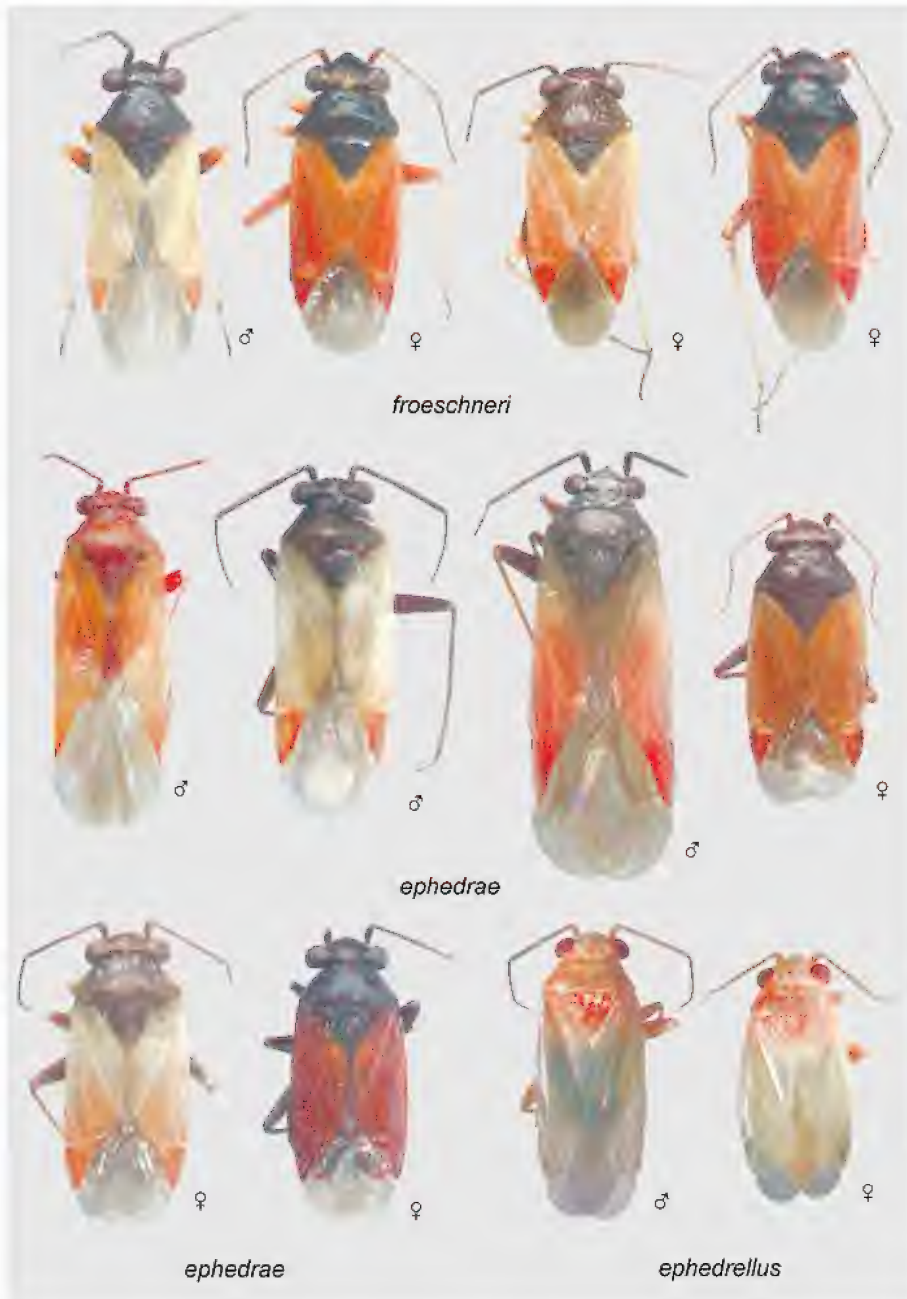


Fig. 8. Habitus photographs of *Megalopsallus* spp. *M. froeschneri* (♂: Nevada, Nye Co., Northumberland Canyon Road, Topquima Mountains, T14N R44E Sec 31. ♀: Utah, San Juan Co., Rt. 63 at Arizona border, Monument Valley; California, San Bernardino Co., Providence Mts State Rec. Area; same as female no. 1). *M. ephedrae* (♂: Nevada, Nye Co., 15.5 mi E of Rt. 376 on Northumberland Mine Rd, T31N R45E Secs 3, 4, 10; Nevada, Lincoln Co., 5 mi NE of jct. Rts 38 & 93; Mexico, Baja California Norte, 12 mi E of El Rosario. ♀: Nevada, Lincoln Co., 5 mi NE of jct. Rts 38 & 93; California, San Bernardino Co., Providence Mts State Rec. Area; California, Inyo Co., 2 mi E of Westgard Pass Summit, White Mts). *M. ephedrellus* (♂ and ♀: Texas, Crockett Co., 16.7 mi W of Ozona).

tus-feeding *rubricornis* (fig. 11), but that species always with cuneus unicolorous with remainder of pale hemelytra and head, with pronotum and scutellum often more strongly reddish.

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

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

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

DISTRIBUTION: Arizona and Nevada south to Zacatecas, Mexico.

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

SPECIMENS EXAMINED: MEXICO. — **Zacatecas:** 13 mi SE of Concepcion del Oro, July 9, 1983, Schaffner, Kovarik, Harrison, 15♂, 18♀ (TAMU). 6 mi S of Concepcion del Oro, July 9, 1983, Kovarik, Harrison, and Schaffner, 46♂, 62♀ (TAMU). USA. — **Arizona:** *Cochise Co.:* July 29, 1927, R. H. Beamer, 1♀ (KU). *Gila Co.:* 5.5 mi W of Roosevelt Dam on Rt. 188, 2000 ft, May 27, 1983, Schuh, Stonedahl, and Massie, 12♀ (AMNH). *Maricopa Co.:* 5 mi S of Freeman SE of Gila Bend, 625 m, May 8, 1978, R. T. Schuh, A. F. Guenther, *Lycium* sp. (Solanaceae), 1♂ (AMNH). 1.8 mi W of Roosevelt on Rt. 88, May 19, 1980, J. D. Pinto, *Lycium* sp. (Solanaceae), 12♂, 12♀ (UCR). *Pima Co.:* Tucson, 2400 ft, April 19, 1926, A. A. Nichol, *Lycium* sp. (Solanaceae), Paratypes: 1♂, 3♀ (USNM, CNC). Rincon Mts, 3300 ft, September 2, 1928, A. A. Nichol, 4♀ (USNM). Organ Pipe Cactus Natl. Mon., Quitobaquito, April 3, 1966, C. W. O'Brien, 1♂ (UCB). Organ Pipe Cactus Natl. Mon., Alamo Wash, 700–800 m, R. T. Schuh and M. D. Schwartz, *Lycium* sp. (Solanaceae), 20♂, 13♀ (AMNH). Organ Pipe Cactus Natl. Mon., Ajo Valley, April 10, 1981, D. A. Polhemus, *Condalia globosa* (Rhamnaceae), 16♂, 7♀ (JTP). Baboquivari Mts, Sabino Canyon, April 20, 1982, D. A. and J. T. Polhemus, *Quercus arizonica* (Fagaceae), 1♂ (JTP). Madera Canyon, May 4, 1988, W. A. Jones, *Solanum eleagnifolium* (Solanaceae), **Nevada:** *Nye Co.:* 2.5 mi NE of Gabbs off Rt. 844, Gabbs Rifle Range, 4800 ft, July 1, 1983, R. T. Schuh and M. D. Schwartz, *Lycium andersonii* (Solanaceae), 2♂, 6♀ (AMNH).

Megalopsallus nigricaput, new species

Figures 6, 9, 15

HOLOTYPE: Male, ARIZONA: Graham County, Stockton Pass, Pinaleno Mts., elev. 5200–5500 ft., June 1–2, 1983, colls. R. T. Schuh, G. M. Stonedahl, *Lycium pallidum* Miers (Solanaceae). Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized unequivocally by the dark head, first antennal segment, coxae, femora, and thoracic sternum in contrast to

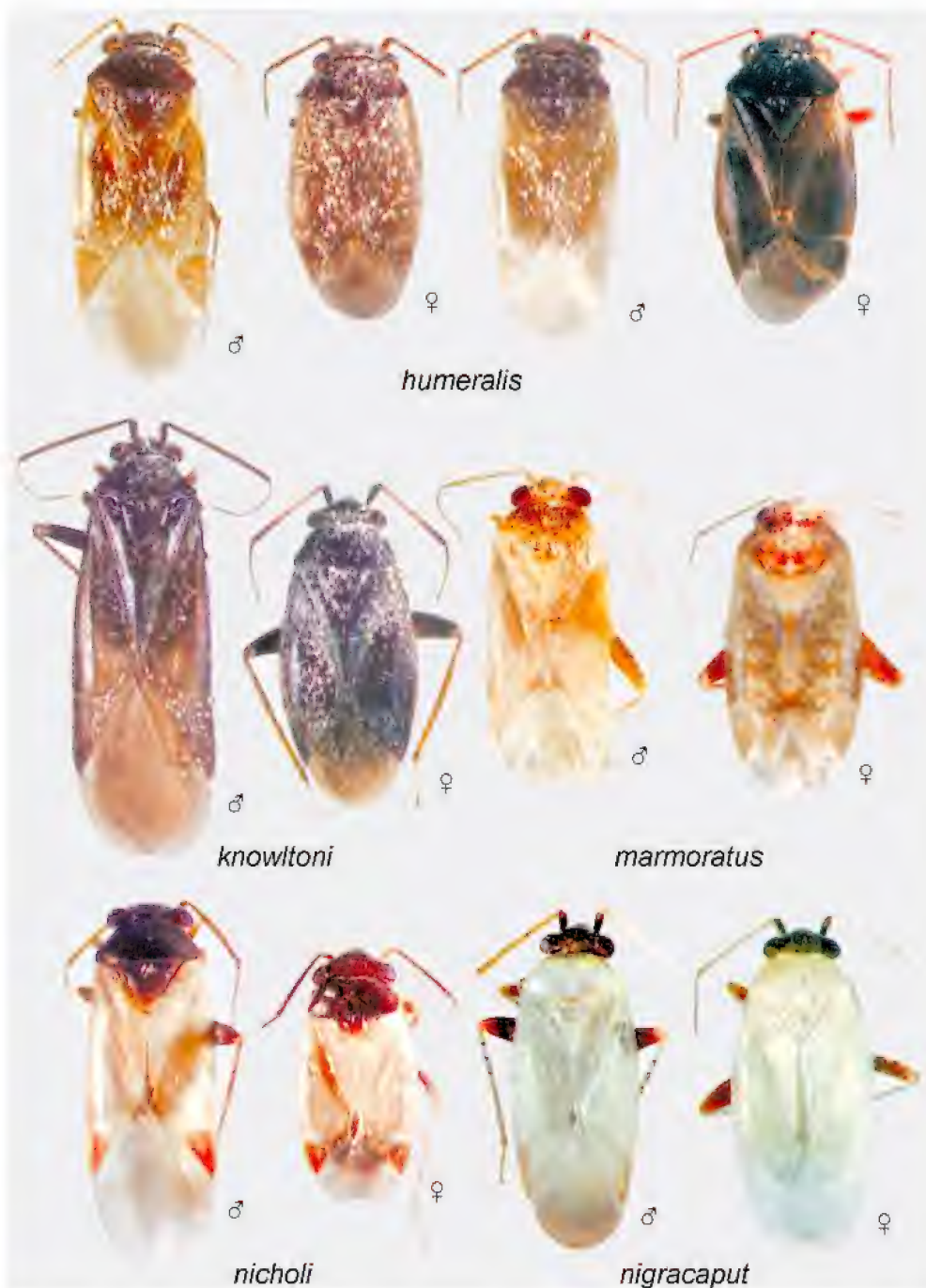


Fig. 9. Habitus photographs of *Megalopsallus* spp. *M. humeralis* (♂: Arizona, Pima Co., Santa Catalina Mts, Finger Rock Canyon Trail. ♀: Nevada, Nye Co., Mercury. ♂: Arizona, Pima Co., Santa Catalina Mts, Bear Creek near Saddleback. ♀: California, San Bernardino Co., 10 mi W of Lucerne Valley). *M. knowltoni* (♂ and ♀: California, Mono Co., 8 mi W of Nevada state line on Rt. 359). *M. marmoratus* (♂: Mexico, Baja Calif. Norte, 1 mi S of Bahia de los Angeles. ♀: Arizona, Maricopa Co., just S of Buckeye). *M. nicholi* (♂: Mexico, Zacatecas, 13 mi SW of Concepcion del Oro. ♀: Mexico, Zacatecas, 6 mi S of Concepcion del Oro). *M. nigricaput* (♂ and ♀: Arizona, Graham Co., Stockton Pass, Pinaleno Mts).

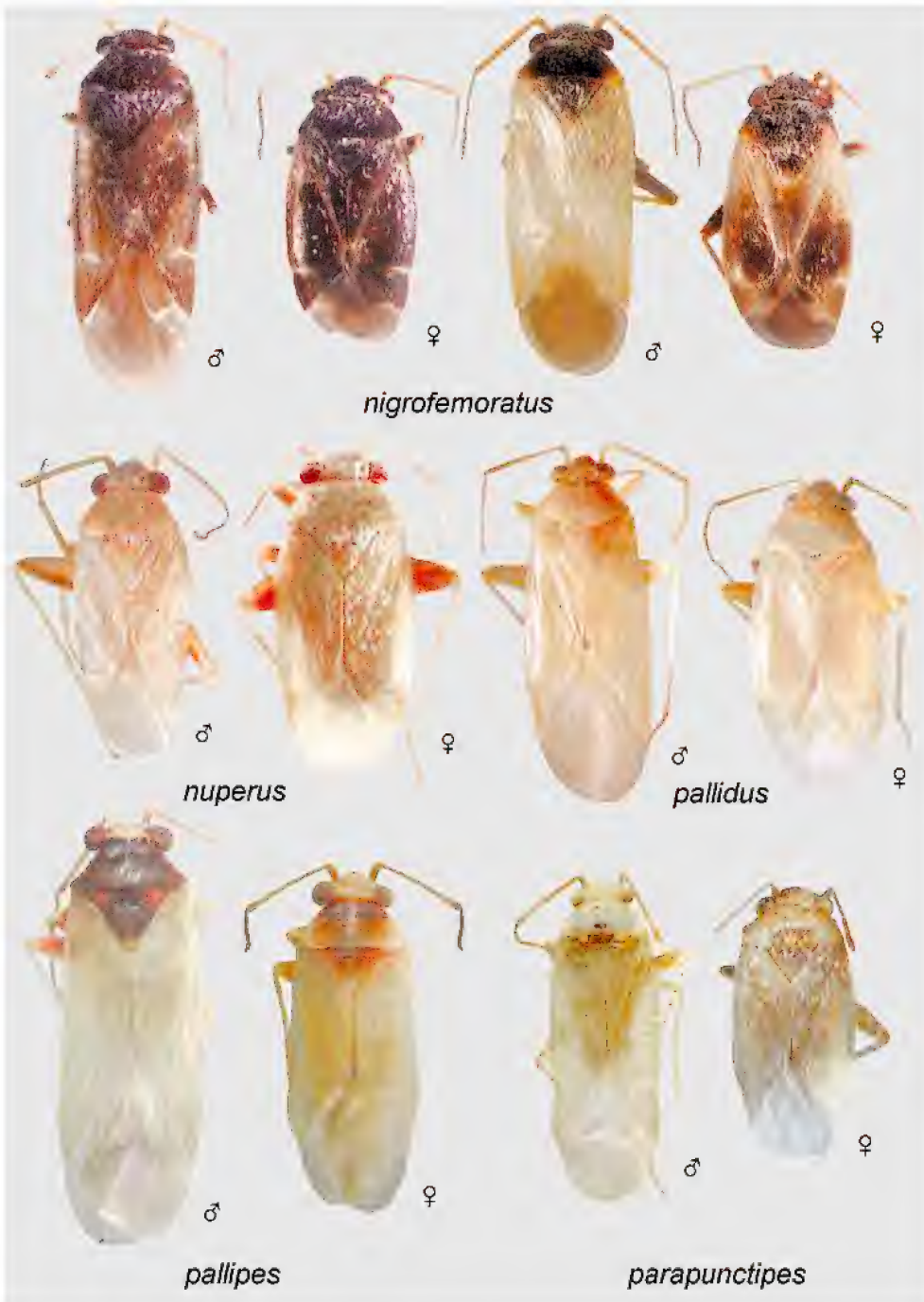


Fig. 10. Habitus photographs of *Megalopsallus* spp. *M. nigrofemoratus* (♂: California, Inyo Co., 2 mi E of Westgard Pass Summit, White Mts; Utah, Uintah Co., 5–10 mi SW of Bonanza. ♀: California, Inyo Co., 2 mi E of Westgard Pass Summit, White Mts; Utah, Uintah Co., 5–10 mi SW of Bonanza). *M. nuperus* (♂ and ♀: Utah, Box Elder Co., Bear River Refuge). *M. pallidus* (♂ and ♀: Nevada, Lander Co., 1.5 mi S of Rt. 50 on Rt. 376). *M. pallipes* (♂: Utah, San Juan Co., Rt. 63 at Arizona border, Monument Valley. ♀: Nevada, Nye Co., 35 mi N of Tonapah, Coyote Hole Spring/Sevier Reservoir). *M. parapunctipes* (♂ Nevada, Eureka Co., 12 mi S of Rt. 50 on Rt. 278. ♀: Nevada, Nye Co., Atomic Test Site, 2.8 mi E of Mercury Highway on Tweezer Road).

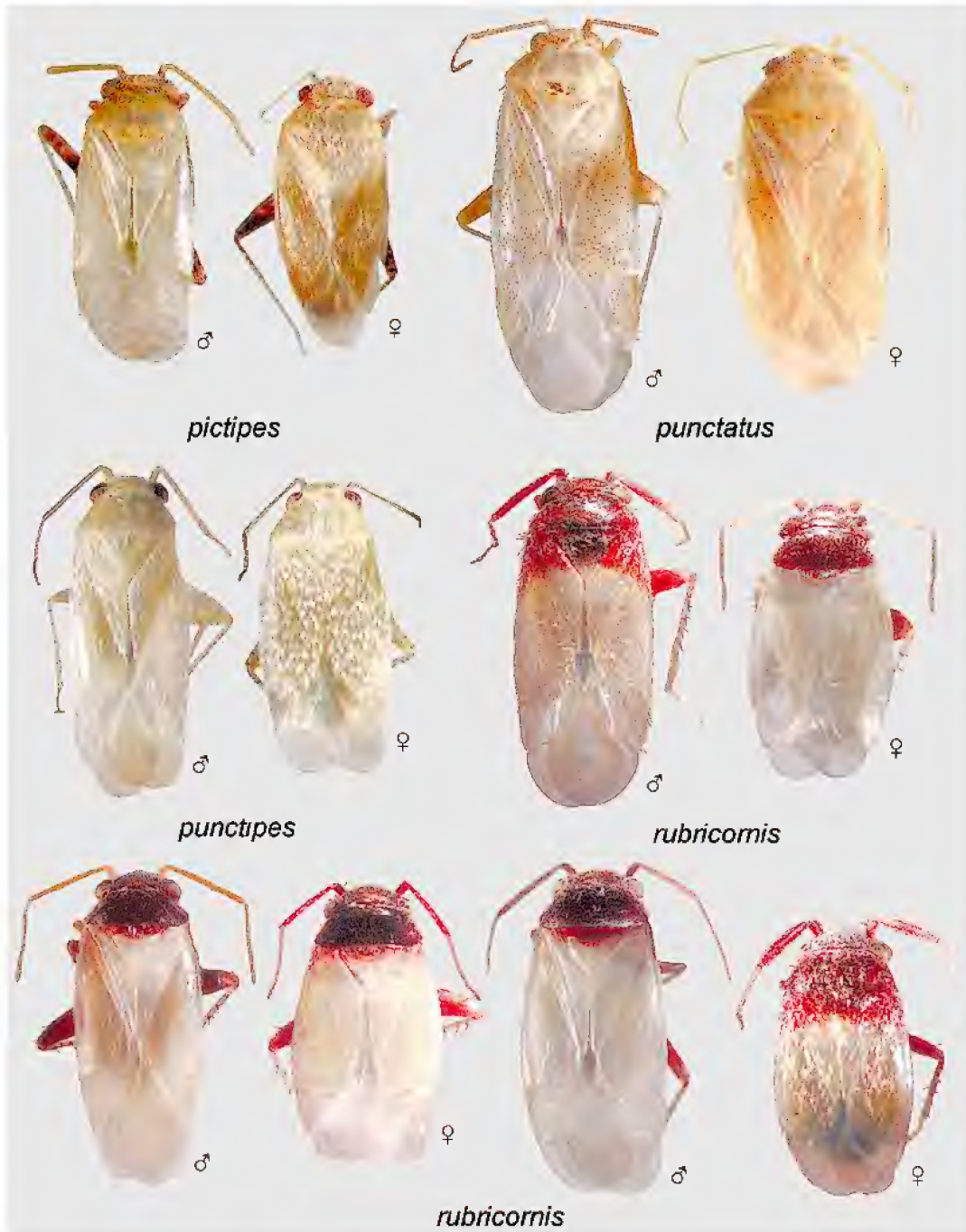


Fig. 11. Habitus photographs of *Megalopsallus* spp. *M. pictipes* (♂: California, Inyo Co., 1 mi W of Keeler. ♀: Utah, Washington Co., St. George). *M. punctatus* (♂ and ♀: Texas, Culberson Co., Van Horn). *M. punctipes* (♂: Utah, Garfield Co., 14.3 mi S of Rt. 95 on Rt. 276. ♀: Utah, Grand Co., Deadhorse Point Road). *M. rubricornis* (♂: California, Mono Co., 8 mi W of Nevada state line on Rt. 359; Nevada, Lyon Co., 8 mi N of Sweetwater Summit; Nevada, Lander Co., 11 mi S of Rt. 50 on Rt. 376. ♀: Nevada, Lyon Co., 8 mi N of Sweetwater Summit; Nevada, Lander Co., 11 mi S of Rt. 50 on Rt. 376; California, Mono Co., 8 mi W of Nevada state line on Rt. 359).

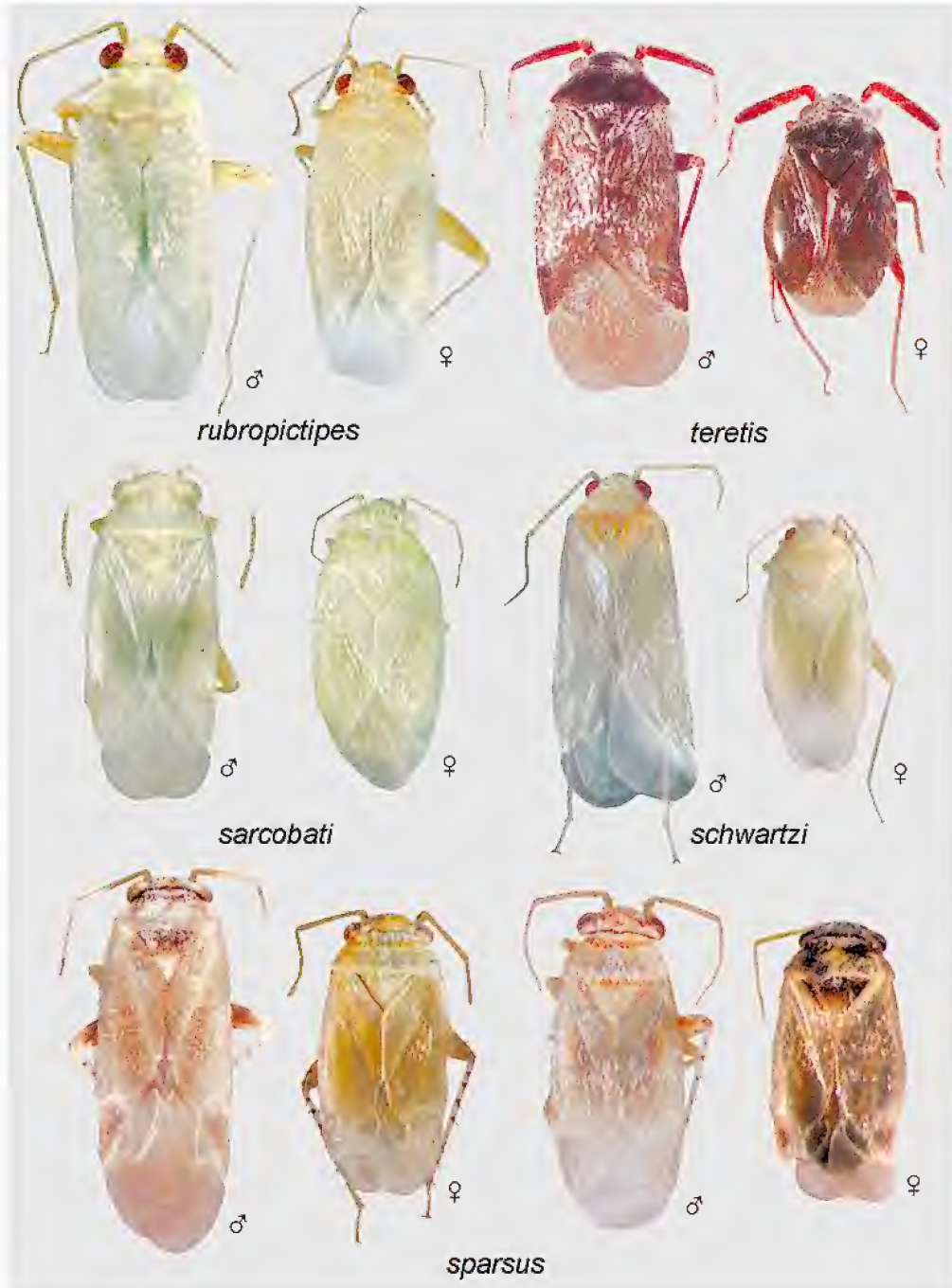


Fig. 12. Habitus photographs of *Megalopsallus* spp. *M. rubropictipes* (♂ and ♀: Nevada, Nye Co., 2.5 mi NE of Gabbs, Rifle Range). *M. teretis* (♂: Nevada, Nye Co., Atomic Test Site, Mercury Highway at Angle Road. ♀: Nevada, Nye Co., 2.5 mi NE of Gabbs, Rifle Range). *M. sarcobati* (♂ and ♀: Nevada, Lander Co., 7.5 mi S of Rt. 50 on Rt. 376). *M. schwartzi* (♂ and ♀: Nevada, Nye Co., 2.5 mi NE of Gabbs, Rifle Range). *M. sparsus* (♂: Utah, Duchesne Co., 23.7 mi S of Myton, Wells Draw; California, Imperial Co., near railroad tracks on Rt. 580. ♀: Arizona, Pima Co., Tucson, Santa Catalina Mts, Bear Creek near Saddleback Dr.; Utah, Duchesne Co., 23.7 mi S of Myton, Wells Draw).

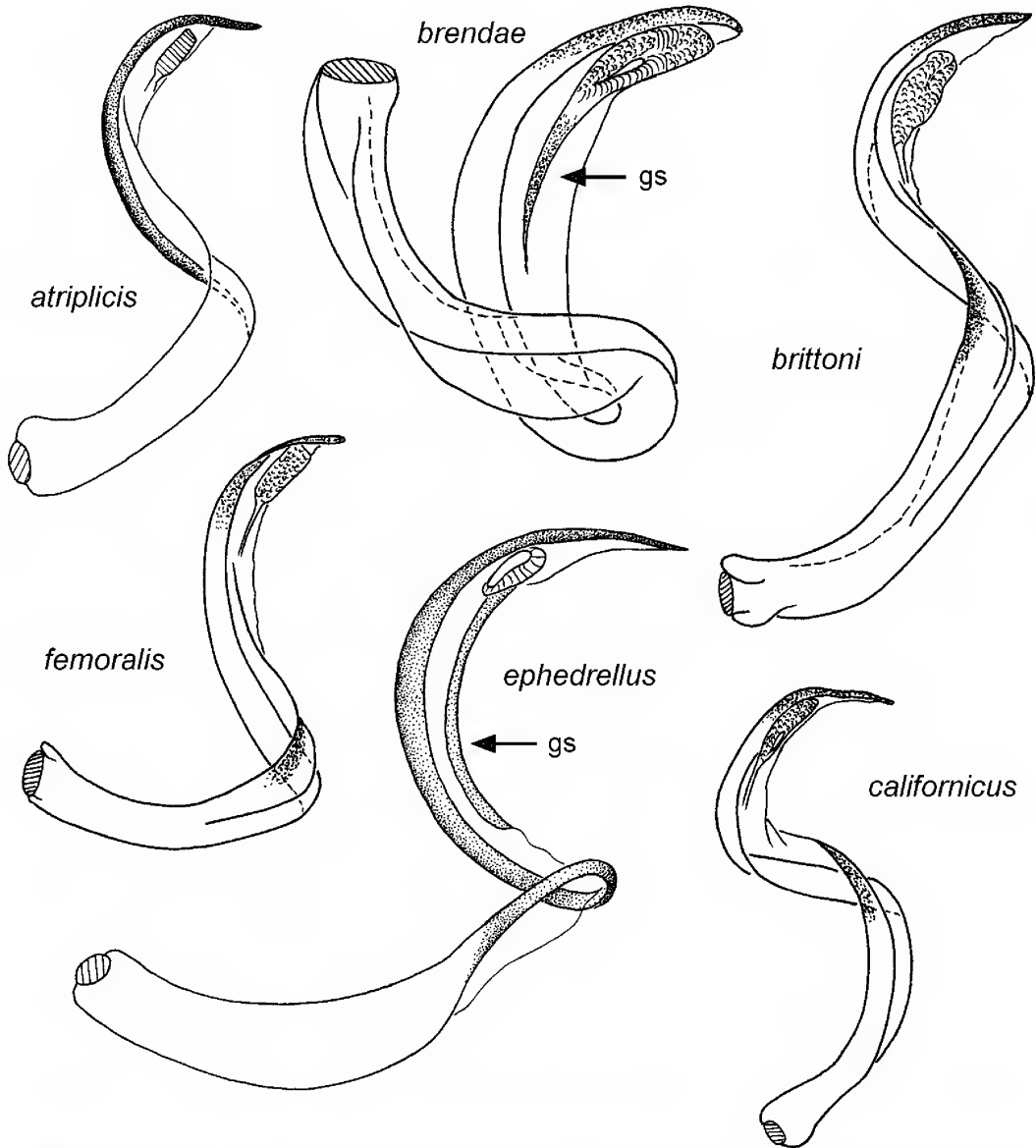


Fig. 13. Male genitalic structures, vesicae of *Megalopsallus* spp. gs = gonopore sclerite.

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

DESCRIPTION: *Male:* Medium sized, total length 3.35–3.44, length apex clypeus–cuneal fracture 2.23–2.33, width across pronotum 1.02–1.10. **COLORATION:** Generally white with a faint greenish cast; head includ-

ing eyes, antennal segment 1, coxae, trochanters, femora, and apex of labium castaneous and strongly contrasting with remainder of body and appendages (fig. 9). **SURFACE AND VESTITURE:** Head weakly shining, remainder of dorsum smooth and dull; dorsum clothed with pale recumbent, simple setae intermixed with scattered, silvery, weakly flattened setae. **STRUCTURE:** Elongate ovoid (fig. 9); labium reaching to

middle trochanters; claws long, slender, smoothly curving, pulvilli minute. MALE GENITALIA: Vesica elongate, S-shaped, apex membranous; gonopore subapical, sclerotized; no gonopore sclerite (fig. 15).

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

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

HOSTS: *Lycium pallidum* (Solanaceae); *Shepherdia argentea* (Elaeagnaceae).

DISTRIBUTION: Arizona, Nevada, and Utah.

PARATYPES: USA. — **Arizona**: *Graham Co.*: Stockton Pass, Pinaleno Mts, 5200–5500 ft, June 1, 1983, R. T. Schuh and G. M. Stonedahl, *Lycium pallidum* (Solanaceae), 114♂, 110♀ (AMNH). *Yavapai Co.*: 22.7 mi S of Ash Fork on Rt. 89, June 4, 1983, G. M. Stonedahl, *Shepherdia argentea* (Elaeagnaceae), 27♂, 26♀ (AMNH). 5 mi N of Prescott on Rt 89, 1800 m, June 20, 1980, R. T. Schuh, *Lycium pallidum* (Solanaceae), 18♂, 64♀ (AMNH). **Nevada**: *Nye Co.*: Atomic Test Site, 4.5 mi S GS500 on Jackass Flats Rd, 3300 ft, June 6, 1983, Schuh, Schwartz, Stonedahl, *Lycium pallidum* (Solanaceae), 1♂ (AMNH). **Utah**: *San Juan Co.*: Grand Flat near Collins Canyon, 5600 ft, May 28, 1978, D. A. and J. T. Polhemus, 20♂, 20♀ (JTP).

Megalopsallus nigrofemoratus (Knight)

Figures 10, 15

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

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

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

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

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

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

DIAGNOSIS: Recognized by frequently dark coloration of most of dorsum and femora, or at least head, pronotum, scutellum, and femora dark and contrasting with pale hemelytra

(fig. 10). Most easily confused with *humeralis* (fig. 10) on basis of size, coloration, and type of sexual dimorphism; readily recognized by structure of male genitalia, vesica in *nigrofemoratus* being more elongate and slender than that of *humeralis*, and its association with *Atriplex* and *Grayia*, whereas *humeralis* feeding only on *Lycium*. Pale specimens separated from the *Lycium*-feeding *nicholi* by having the cuneus unicolorous with corium.

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

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

HOSTS: *Atriplex canescens*, *A. confertifolia*, *A. sp.*, *Grayia spinosa*, *Sarcobatus bailleyi*, *S. vermiculatus* (Chenopodiaceae). Probable sitting records: *Artemisia cana*, *A. nova*, rabbit bush [*Chrysothamnus*] (Asteraceae); *Condalia globosa*, *Rhamnus sp.* (Rhamnaceae).

DISTRIBUTION: Interior of western North

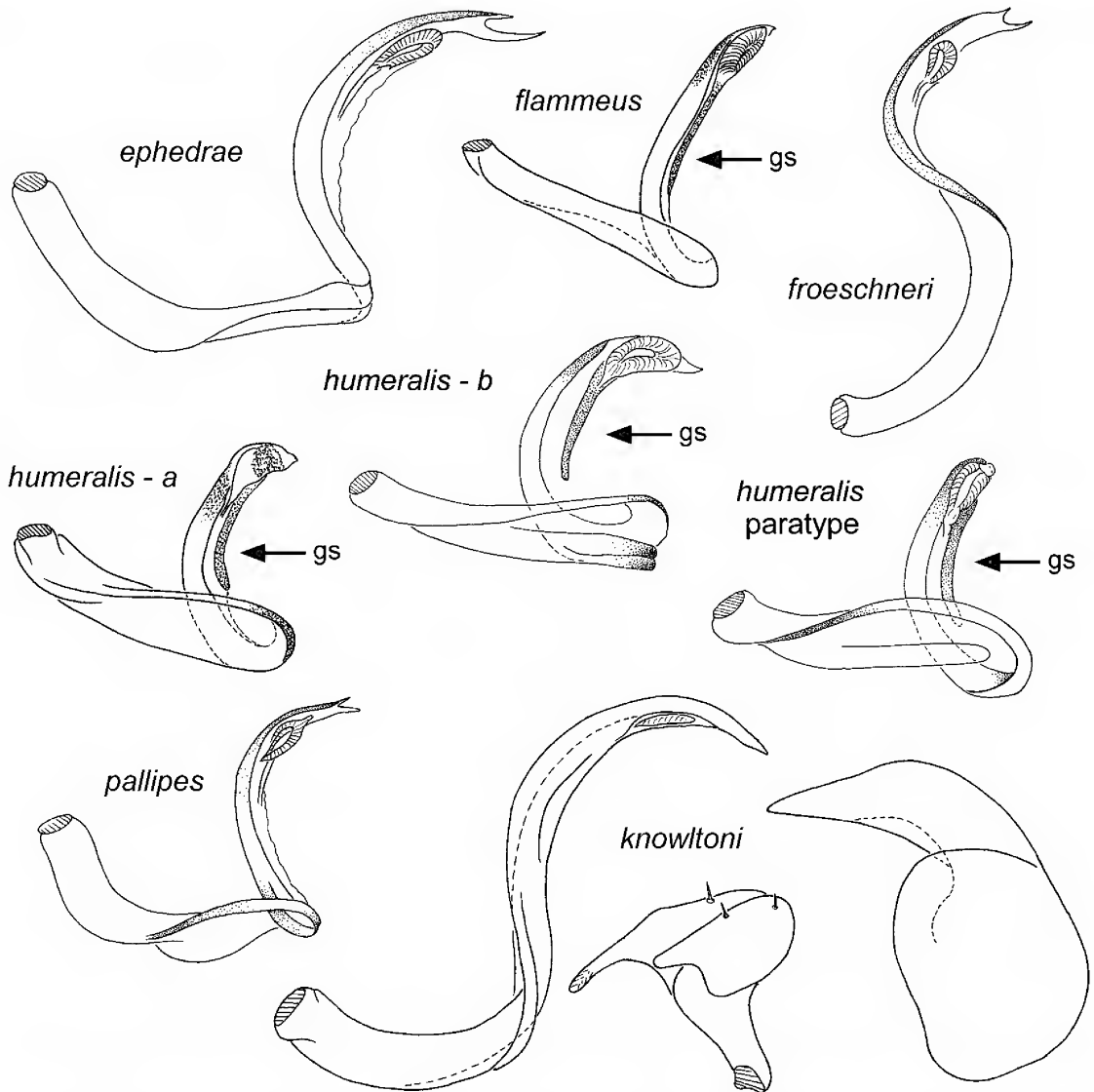


Fig. 14. Male genitalic structures, vesicae of *Megalopsallus* spp. Left paramere and phallosome of *M. knowltoni*. gs = gonopore sclerite.

America from Alberta, Canada, south to Zacatecas, Mexico.

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

nigrofemoratus and therefore treat the three nominal species as synonymous.

SPECIMENS EXAMINED: CANADA. — **Alberta:** Mayberries, July 8, 1952, L. A. Konotopetz, *Sarcobatus* sp. (Chenopodiaceae), 8♂, 10♀ (CNC). **Saskatchewan:** Wood Mountain, August 8, 1955, A. R. Brooks, 2♀ (CNC). MEXICO. — **Baja California Norte:** 12 mi E of El Rosario, March 25, 1979, J. D. Pinto, *Atriplex* sp. (Chenopodiaceae), 1♂ (UCR). **Nuevo Leon:** Santa Ana, Sep-

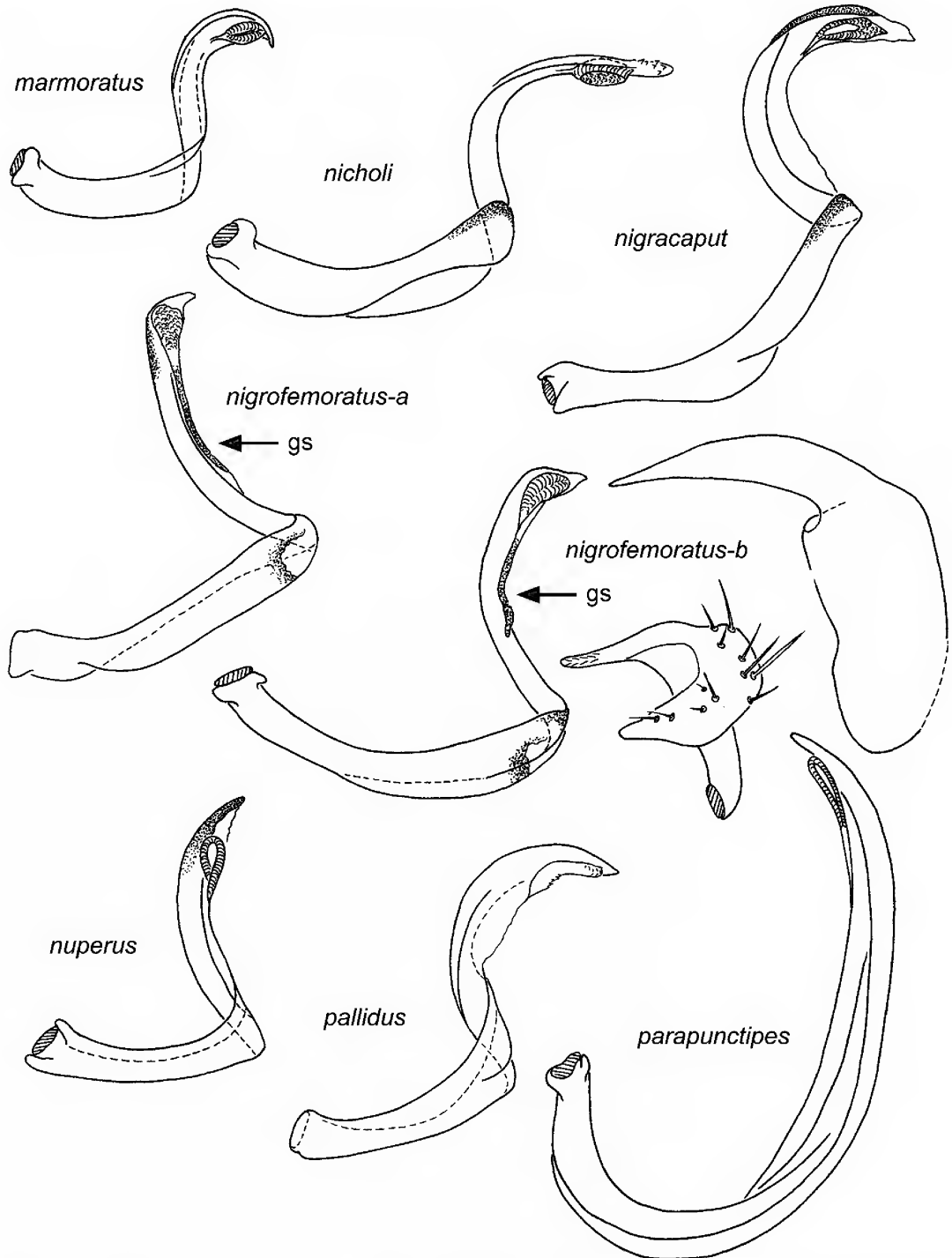


Fig. 15. Male genitalic structures, vesica of *Megalopsallus* spp. Left paramere and phallosome of *M. nigrofemoratus*. gs = gonopore sclerite.

tember 8, 1969, L. A. Kelton, 4♂, 4♀ (CNC). **San Luis Potosi:** 19.6 mi S of Huizache, July 25, 1976, Schaffner et al., 4♂, 4♀ (TAMU). 28.5 mi S of Huizache, July 4, 1985, Jones, Schaffner, 7♂, 12♀ (TAMU). **Sonora:** 40 mi W of Moctezuma, April 27, 1981, D. A. and J. T. Polhemus, *Rhamnus* sp. (Rhamnaceae), 1♂, 10♀ (JTP). **Zacatecas:** 13 mi SW of Concepcion del Oro, July 9, 1983, Kovarik, Harrison, and Schaffner, 17♂, 14♀ (TAMU). Concepcion del Oro, July 8, 1983, Kovarik, Harrison, Schaffner, 2♂ (TAMU). 30 mi SW of Concepcion del Oro, July 9, 1983, Kovarik, Harrison, and Schaffner, 35♂, 21♀ (TAMU). 6 mi S of Concepcion del Oro, July 9, 1983, Kovarik, Harrison, Schaffner, 1♂, 3♀ (TAMU). USA. — **Arizona:** Eager, Apache Natl. Forest, 7500 ft, July 12, 1968, L. A. Kelton, (Asteraceae), 3♀ (CNC). *Coconino Co.:* 1 mi E of Tuba City on Rt. 163, 5000 ft, June 16, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♂, 6♀ (AMNH). Marble Canyon Monument, T7E R39N, 3603 ft, April 18, 1982, M. D. Schwartz, *Atriplex confertifolia* (Chenopodiaceae), 20♂, 6♀ (AMNH). Red Lake on Rt. 160, June 26, 1980, K. & R. Schmidt, *Sarcobatus vermiculatus* (Chenopodiaceae), 3♀ (AMNH). Rt. 64 just SE of Grand Canyon Natl. Park, June 26, 1980, K.&R. Schmidt, *Atriplex canescens* (Chenopodiaceae), 1♀ (AMNH). *Maricopa Co.:* Palo Verde Rd at Rt. 85 just S of Buckeye, 335 m, April 1, 1981, R. T. Schuh and M. D. Schwartz, *Atriplex* sp. (Chenopodiaceae), 2♂ (AMNH). *Pima Co.:* 10 mi S of Robles jct., April 20, 1982, D. A. and J. T. Polhemus, *Atriplex* sp. (Chenopodiaceae), 1♂ (JTP). Tucson, April 16, 1939, B. P. Bliven, 2♂ (CAS). Santa Catalina Mts, Finger Rock Canyon Trail, 3000–3500 ft, April 5, 1981, M. D. Schwartz, *Artemisia cana* (Asteraceae), 1♂, 2♀ (AMNH). Organ Pipe Cactus Natl. Mon., Ajo Valley, April 10, 1981, D. A. Polhemus, *Condalia globosa* (Rhamnaceae), 6♂, 5♀ (JTP). 7 mi SE of Continental on rd to Madeira Canyon, 3700 ft, September 28, 1988, M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 2♀ (AMNH). *Yavapai Co.:* Caslte Wash north of Phoenix, March 21, 1980, J. T. Polhemus, 1♂, 3♀ (JTP). **California:** *Inyo Co.:* Mono Lake, Tioga Lodge, June 22, 1929, R. L. Usinger, 2♀ (CAS). Saline Valley, May 25, 1975–June 5, 1976, D. Guilian, 3♂ (LACM). Darwin, May 12, 1969, P. A. Opler, 1♀ (UCB). 9 mi NE of Big Pine, 6300 ft, June 9, 1966, W. Gagne, 1♂ (UCB). 8 mi NE of Independence, Mazourka Canyon, May 11, 1969, J. T. Doyen, 5♂, 18♀ (UCB). 7 mi NE of Panamint Springs, May 16, 1969, P. Rude and J. Doyen, 12♂, 2♀ (UCB). 2 mi E of Westgard Pass Summit, White Mts, 2125 m, July 2, 1980, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 6♂, 11♀ (AMNH). Surprise Canyon, Panamint Mts, April 24, 1957, J. Powell, 1♂ (UCB). *San Bernardino Co.:* 1.5 mi W of Kramer Junction, April 24, 1980, M. D. Schwartz, *Atriplex confertifolia* (Chenopodiaceae), 7♂, 13♀ (AMNH). 3 mi S of Kramer Junction, April 15, 1965, D. Veirs, 5♂, 3♀ (UCB). 3 mi W of Lucerne Valley, May 5, 1975, J. D. Pinto, 5♂, 1♀ (UCR). 6 mi SE of Kramer Junction, April 8, 1966, L. and C. W. O'Brien, 15♂, 13♀ (UCB). Goldstone Lake, April 26, 1953, R.O. Schuster, 2♀ (UCB). **Colorado:** *Eagle Co.:* N of Eagle, June 24, 1979, J. T. Polhemus, 2♀ (JTP). *Mesa Co.:* Rabbit Valley, June 7, 1981, J. T. Polhemus, 1♂ (JTP). E of Palisade, Plateau Creek, June 6, 1981, J. T. Polhemus, 4♂ (JTP). *Mineral Co.:* Creede, June 21, 1990, J. T. and D. A. Polhemus, 6♂, 10♀ (JTP). *Moffat Co.:* 5 mi S of Baggs, Wyoming, 6350 ft, August 14, 1986, R. T. Schuh, *Sarcobatus vermiculatus* (Chenopodiaceae), 15♂, 20♀ (AMNH). Gates of Lodore, June 28, 1979, D. A. Polhemus, 2♂, 3♀ (JTP). *Montezuma Co.:* 4 mi E of Cortez, August 16, 1973, J. C. Schaffner, 8♀ (TAMU). Cortez, July 19, 1968, L. A. Kelton, *Salicornia* sp. (Chenopodiaceae), 6♂, 14♀ (CNC). Mesa Verde Natl. Park, June 10, 1968, J. E. Slansky, 2♀ (UCD). *Montrose Co.:* 6 mi E of Montrose, August 13, 1987, T.J. Henry, *Atriplex canescens* (Chenopodiaceae), 5♂, 10♀ (USNM). *Pueblo Co.:* Pueblo, June 15, 1900, 4♂ (USNM). *Rio Blanco Co.:* W Evacuation Creek, 4 mi SE of state line on Rt. 45, 6400 ft, July 9, 1981, M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 3♂, 1♀ (AMNH). **Montana:** *Carbon Co.:* Bear Creek between Red Lodge and Belfry, 5000 ft, August 12, 1986, M. D. Schwartz and G. M. Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 21♂, 45♀

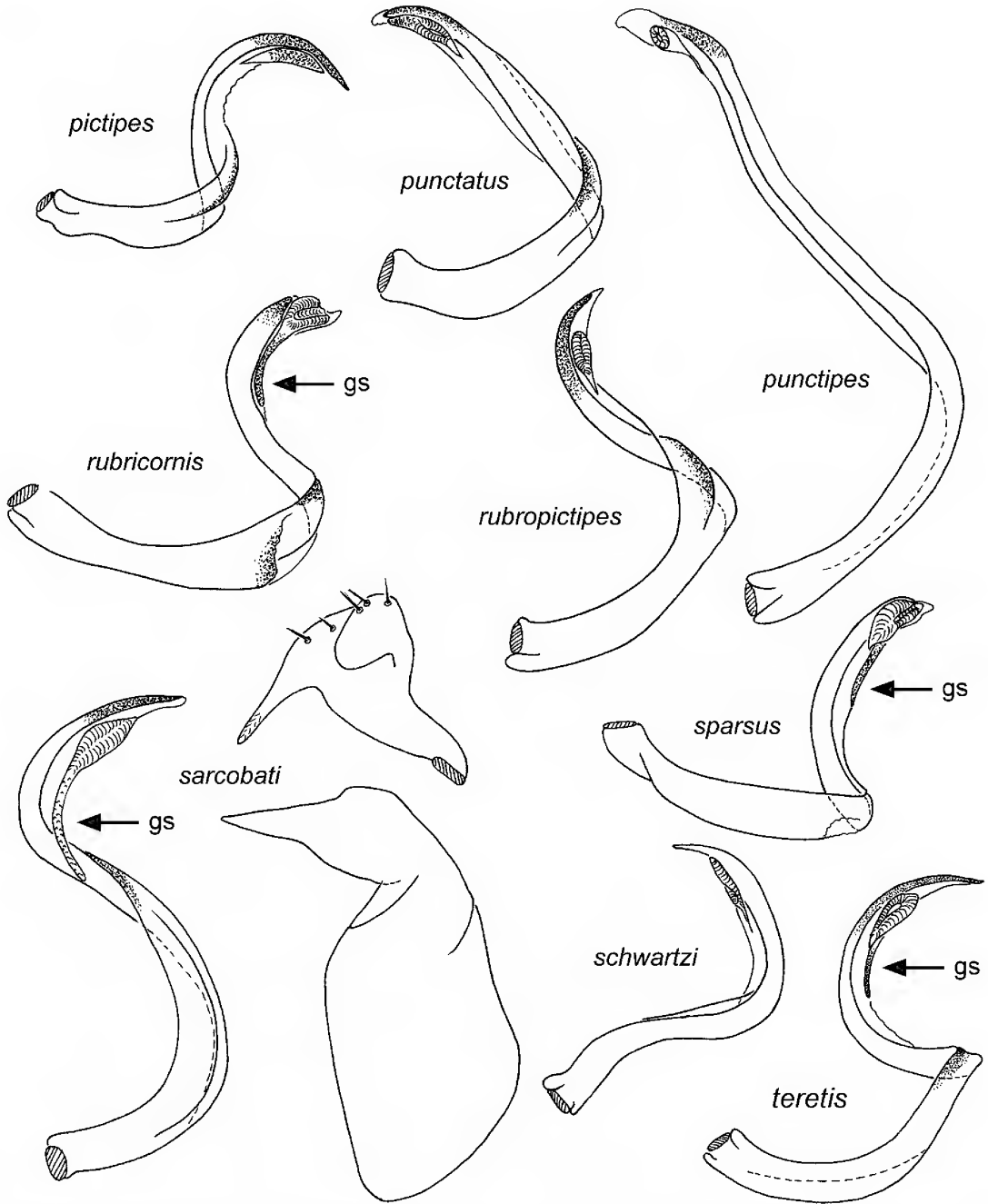


Fig. 16. Male genitalic structures, vesicae of *Megalopsallus* spp. Left paramere and phallosome of *M. sarcobati*. gs = gonopore sclerite.

(AMNH). *Gallatin Co.*: Bozeman, July 17, 1926, W. Downes, 1 ♀ (USNM). *Yellowstone Co.*: Billings, August 4, 1927, H. H. Knight, 3 ♀ (USNM). **Nevada**: *Clark Co.*: 1 mi E of Searchlight, 1095 m, May 17, 1978, R. T.

Schuh, 3 ♂, 5 ♀ (AMNH). *Elko Co.*: 2.2 mi NE of Cobre on state Rt. 233, 5900 ft, June 25, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex confertifolia* (Chenopodiaceae), 6 ♀ (AMNH). 2.2 mi NE of Cobre on state Rt.

- 233, 5900 ft, June 25, 1983, R. T. Schuh and M. D. Schwartz, *Grayia spinosa* (Chenopodiaceae), 18♂, 19♀ (AMNH). 23.7 mi S of jct. Rt. 229 on Rt. 93, July 19, 1980, G. M. Stonedahl, *Atriplex* sp. (Chenopodiaceae), 4♀ (AMNH). Utah state line on Utah Rt. 30, 4760 ft, June 25, 1983, R. T. Schuh and M. D. Schwartz, *Grayia spinosa* (Chenopodiaceae), 22♂, 25♀ (AMNH). *Eureka Co.*: Garden Summit on Rt. 278, 23.5 mi N of Rt. 50, 6500 ft, June 27, 1983, R. T. Schuh and M. D. Schwartz, *Grayia spinosa* (Chenopodiaceae), 7♂, 18♀ (AMNH). *Humboldt Co.*: 27 mi W of Denio, June 23, 1971, P. Oman, 1♂ (OSU). Sheldon Natl. Antelope Range. 0.5 mi S of jct. 8A and 343A, 1950 m, July 2, 1979, R. T. Schuh and B. M. Massie, *Atriplex* sp. (Chenopodiaceae), 13♂, 26♀ (AMNH). *Lander Co.*: 1.5 mi S of Rt 50 on Rt 376, T18N R45E, 6000 ft, June 28, 1983, R. T. Schuh and M. D. Schwartz, *Grayia spinosa* (Chenopodiaceae), 18♂, 60♀ (AMNH). *Lincoln Co.*: 5 mi NE of jct. Rts 38 & 93, 2500 ft, May 19, 1982, M. D. Schwartz, *Grayia spinosa* (Chenopodiaceae), 13♂, 27♀ (AMNH). *Lyon Co.*: Weeks, May 29, 1967, C. W. O'Brien, *Sarcobatus vermiculatus* (Chenopodiaceae), 2♂ (UCB). *Mineral Co.*: 27 mi SW of Hawthorne on Rt 359, 1 mi NE of Anchorite Summit, 7400 ft, July 2, 1983, R. T. Schuh and M. D. Schwartz, *Grayia spinosa* (Chenopodiaceae), 18♂, 14♀ (AMNH). *Nye Co.*: Mercury, 18 M, June 11, 1965, H. Knight and J. Merino, *Grayia spinosa* (Chenopodiaceae), 17♂, 13♀ (USNM). Test Site, 6.8 mi SE Mercury Hwy on Orange Blossom Rd, 4000 ft, June 8, 1983, Schuh, Schwartz, and Stonedahl, 1♂ (AMNH). Mercury, 40M, June 14, 1965, H. Knight and J. Merino, *Grayia spinosa* (Chenopodiaceae), 7♂, 8♀ (USNM). Berlin Ichthyosaur State Mon. on Rt. 844, 6350 ft, July 1, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus baileyi* (Chenopodiaceae), 1♀ (AMNH). Atomic Test Site, Mercury Hwy at Angle Rd, 3800 ft, June 8, 1983, Schuh, Schwartz, and Stonedahl, *Grayia spinosa* (Chenopodiaceae), 6♂, 5♀ (AMNH). Atomic Test Site, Mercury Hwy at Angle Rd, 3800 ft, June 8, 1983, Schuh, Schwartz, and Stonedahl, *Atriplex canescens* (Chenopodiaceae), 6♂, 2♀ (AMNH). Atomic Test Site, Jackass Flats Road, 3300 ft, June 6, 1983, Schuh, Schwartz, and Stonedahl, 2♂ (AMNH). 5.5 mi S of Belmont on Rt. 82, 2031 m, July 13, 1980, R. T. Schuh and G. M. Stonedahl, *Atriplex* sp. (Chenopodiaceae), 4♂, 13♀ (AMNH). 35 mi N of Tonapah, Coyote Hole Spring/Sevier Reservoir, T8 R42E S11 & 23, 6000 ft, June 30, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* var. *baileyi* (Chenopodiaceae), 5♀ (AMNH). Northumberland Canyon Rd, Toquima Mts, 6400 ft, June 28, 1983, R. T. Schuh and M. D. Schwartz, *Grayia spinosa* (Chenopodiaceae), 2♂, 2♀ (AMNH). *Washoe Co.*: Verdi, July 9, 1967, W. Gagne, 1♀ (UCB). **New Mexico**: *Taos Co.*: Ojo Caliente, June 6, 1982, D. A. and J. T. Polhemus, *Atriplex* sp. (Chenopodiaceae), 1♂, 5♀ (JTP). **Oregon**: *Harney Co.*: Alvord Basin, T37S R33E S26, April 26, 1979, Cobb and Lightfoot, *Atriplex spinosa* (Chenopodiaceae), 1♂, 1♀ (OSU). T37S R33E, Lightfoot and Cobb, *Atriplex spinosa* (Chenopodiaceae), 4♂, 4♀ (OSU). **Utah**: *Duchesne Co.*: 23.7 mi S of Myton, Well's Draw, T10S R15E, 6000 ft, M. D. Schwartz, 1♀ (AMNH). *Garfield Co.*: Capitol Reef Natl. Park, Grand Wash, Cohab Canyon Trail, 5350–6640 ft, June 21, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 56♂, 33♀ (AMNH). *Grand Co.*: East of Moab, Utah, Colorado River Bridge, May 26, 1979, J. T. and D. A. Polhemus, 10♂, 14♀ (JTP). 11 mi SE of Rt 163 toward Dead Horse Point on Rt. 313, 5200 ft, June 11, 1982, M. D. Schwartz, *Grayia spinosa* (Chenopodiaceae), 11♂, 12♀ (AMNH). *Millard Co.*: Longridge Reservoir Cutoff on Rt. 50/6, 4500 ft, May 19, 1982, M. D. Schwartz, *Atriplex confertifolia* (Chenopodiaceae), 20♂, 14♀ (AMNH). *San Juan Co.*: 25 mi N of Monticello on Rt. 191, 5700 ft, July 18, 1986, R. T. Schuh, *Sarcobatus vermiculatus* (Chenopodiaceae), 34♂, 63♀ (AMNH). *Sevier Co.*: 32 mi N of Hiway 24 on Hiway 72, 7560 ft, July 17, 1980, G. M. Stonedahl, *Atriplex* sp. (Chenopodiaceae), 1♀ (AMNH). *Uintah Co.*: 5–10 mi SW of Bonanza, T10S R24E, 5000–5600 ft, June 6, 1981–June 8, 1982, M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 82♂, 92♀ (AMNH). **Wyoming**: *Big Horn Co.*: 1 mi W of Shell Creek Falls Scenic Overlook on Rt. 14, 5600 ft, August 13, 1986, Schuh, Schwartz, and

Stonedahl, *Artemisia nova* (Asteraceae), 1 ♂ (AMNH).

Megalopsallus nuperus (Van Duzee)

Figures 10, 15, 17

Oncotylus nuperus Van Duzee, 1923: 157 (n. sp.).
Megalopsallus nuperus: Carvalho, 1958: 72 (cat.,
n. comb.).

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

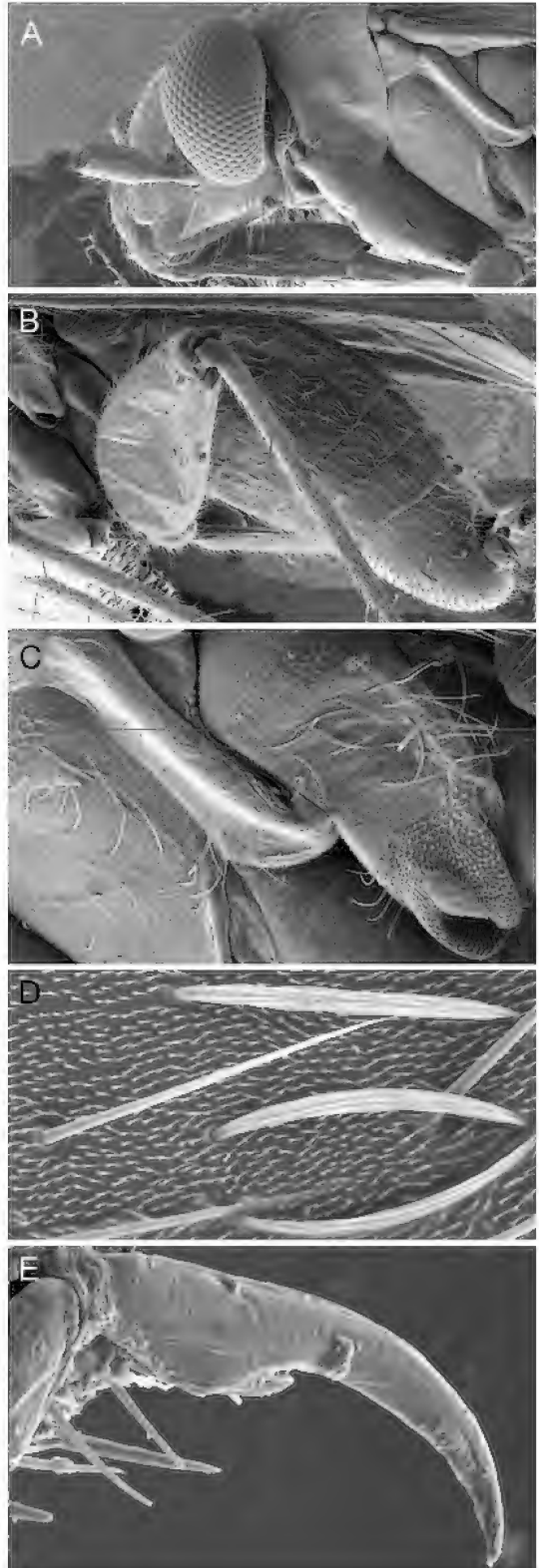
Megalopsallus diversipes latifrons Knight, 1927:
226 (n. ssp.). NEW SYNONYMY.

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

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

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Fig. 17. *Megalopsallus nuperus*, male, scanning micrographs. **A.** Lateral view of head and thorax. **B.** Lateral view of male abdomen. **C.** Mesothoracic spiracle and metathoracic scent gland evaporatory area. **D.** Detail of setae comprising dorsal vestiture. **E.** Inner surface of claw.



Female: Total length 3.22–3.27, length apex clypeus–cuneal fracture 2.40–2.92, width across pronotum 1.05–1.33; more robust in appearance than male (fig. 10).

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

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

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

Comparison of *nuperus*, *diversipes*, and *latifrons* has forced me to conclude—in the absence of further information in the form of well-preserved, host-associated specimens—that all of these nominal species should be treated as synonymous. The combined distribution of this species ranges from the Gulf of California to the Gulf Coast of Florida north into Colorado and parts of Utah. Even though there is some variation in size, virtually all specimens are pale. The genitalia are all very similar, showing some variation in the length of the apical spine, but are nonetheless of little help in distinguishing multiple species. Of all taxa treated in the present work, *nuperus* could possibly benefit most from the analysis of additional, well-preserved, host-documented material from across its entire range.

The six specimens examined from the Dominican Republic agree closely with the material used by Knight (1927) from Biloxi, Mississippi, in his description of *Megalopsallus latifrons diversipes*, including size, vestiture, red eyes, and form of the male genitalia. They are, however, much more obviously green than any specimens that I have attributed to *nuperus*. In his description of *latifrons*, Knight noted that the specimens he examined were pale green. It appears that most of the specimens I have examined have yellowed over time, probably as a result of the methods of preservation and storage.

SPECIMENS EXAMINED: DOMINICAN REPUBLIC. — Monte Cristi Prov.: 15 km N of Dajabon, 2 km N of Copey, sea level, 19° 31' 48" N 71° 40' 42" W, April 26, 2000, T. J. Henry and R. E. Woodruff. ex *Batis* sp. (Bataceae), 4♂, 2♀ (USNM). MEXICO. — **Baja California Norte**: San Francisco Island, May 30, 1921, E. P. Van Duzee, Paratypes: 6♂, 6♀ (CAS). **Chihuahua**: Meoqui, May 30, 1964, L. A. Kelton, *Chenopodium*, 3♀ (CNC). **Durango**: 10 mi W of El Salto, August 3, 1964, L. A. Kelton, 13♂, 11♀ (CNC). **Nayarit**: San Blas, April 24–26, 1961, Howden and Martin, 1♂, 5♀ (CNC). **San Luis Potosi**: Huichihuayan, September 25, 1938, L.J. Lipovsky, 1♀ (KU). **Sinaloa**: Mazatlan, July 16, 1964–August 6, 1964, L. A. Kelton, *Salicornia* sp. (Chenopodiaceae), 66♂, 108♀ (CNC, AMNH). **Sonora**: Kino Bay, August 5, 1997, ex *Salicornia* sp., 4♂, 4♀ (UAZ). USA. — **Colorado**: *Delta Co.*: Delta, July 20, 1898, 1♀ (USNM). *Larimer Co.*: Fort Collins, August 30, 1898, 1♂ (USNM). *Las Animas Co.*: Delhi, August 6, 1925, H. H. Knight, *Suaeda diffusa* (Chenopodiaceae), 19♀ (CNC, USNM). *Mesa Co.*: Grand Junction, July 28, 1900, 5♀ (USNM). *Pueblo Co.*: Pueblo, July 21, 1900, E. P. Van Duzee, Paratypes: 5♂, 5♀ (CAS). Pueblo, September 15, 1898, 4♂, 4♀ (USNM). **Florida**: *Brevard Co.*: Cocoa Beach, May 22, 1927, E. D. Ball, *Suaeda* sp. (Chenopodiaceae), 1♂, 4♀ (USNM). **Louisiana**: *St. Tamman Co.*: Covington, June 23, 1948, E. L. Todd, 1♂ (KU). **Mississippi**: *Harrison Co.*: Biloxi, June 14, 1917, H. H. Knight, 1♂ (USNM); Paratypes: 23♂, 27♀ (CNC, USNM). Biloxi, June 25, 1948, R. H. Beamer, 1♀ (KU). **Texas**: ?? *Co.*: San Juan, June 28, 1938, L. W. Hepner, 1♂, 3♀ (KU). Cedar Lake, August 9, 1928, R. H. Beamer, 2♂ (KU). *Brazoria Co.*: August 10, 1928, R. H. Beamer, 21♂, 7♀ (KU, AMNH). *Calhoun Co.*: Port Lavaca, *Dondia linearis* (Apiaceae), 1♂, 2♀ (USNM). *Cameron Co.*: 4 mi ESE of Brownsville, October 20, 1997, W. F. Chamberlain, 2♀ (TAMU). Boca Chica, June 9, 1970, V. V. Board, 4♂, 3♀ (AMNH). Brownsville, May 10, 1930, R. L. McGarr, 1♂ (USNM). *Hidalgo Co.*: May 20, 1930, J. C. Gaines, 5♀ (USNM). McAllen, July 2, 1938, R.I. Sailer, 1♂ (KU). *Limestone Co.*: Victoria, June 25, 1917, H. H. Knight, 1♀

(USNM). *San Patricio Co.*: Sinton, July 31, 1964, M.H. Sweet, 1 ♀ (TAMU). **Utah:** *Box Elder Co.*: Bear River Refuge, July 26, 1949, G. Ruhr, 4 ♂, 16 ♀ (AMNH, CNC, USNM). *Cache Co.*: Logan, W.G. Firestone, 2 ♂ (USU). *Juab Co.*: Nephi, July 6, 1965, G. F. Knowlton, 2 ♂ (USU). Mona, July 6, 1965, G. F. Knowlton, 1 ♂ (USU). *Salt Lake Co.*: Salt Lake City airport, July 6, 1975, G. F. Knowlton, 1 ♀ (UCD). *Utah Co.*: Benjamin, July 20, 1963, G. F. Knowlton, 1 ♂ (USU). *Weber Co.*: Ogden, July 12, 1967, G. F. Knowlton, 1 ♂ (USU).

Megalopsallus pallidus (Knight),
new combination
Figures 10, 15, 18

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

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

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

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

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

DISTRIBUTION: Central and southern Nevada.

DISCUSSION: Knight (1968) placed *pallidus*

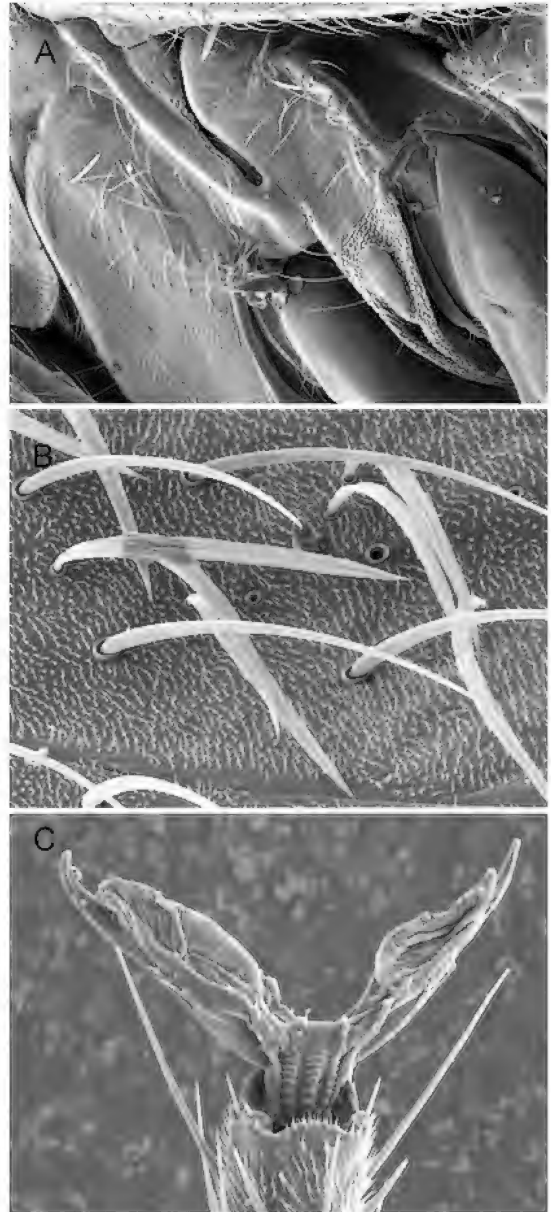


Fig. 18. *Megalopsallus pallidus*, male, scanning micrographs. **A.** Mesothoracic spiracle and metathoracic scent gland evaporatory area. **B.** Detail of setae comprising dorsal vestiture. **C.** Ventral view of pretarsus.

in *Nevadocoris* on the basis of pulvillar structure, coloration, and antennal structure. Examination of the male genitalia indicates that *pallidus* is a *Megalopsallus* species, a placement corroborated by its known occurrence only on species of *Atriplex* and *Grayia*

(Chenopodiaceae). *Nevadocoris becki*, the type of the genus in which *pallidus* was originally placed, has male genitalia dissimilar in structure to those of species here placed in *Megalopsallus* and breeds with members of the Asteraceae, including *Tetradymia* and *Chrysothamnus*.

SPECIMENS EXAMINED: USA. — **Nevada:** *Clark Co.:* 2.5 mi E of Searchlight, 935 m, May 17, 1978, R. T. Schuh, 1♂ (AMNH). *Elko Co.:* State line on Utah Rt. 30, 4760 ft, June 25, 1983, R. T. Schuh and M. D. Schwartz, *Grayia spinosa* (Chenopodiaceae), 9♂, 4♀ (AMNH). *Lander Co.:* 1.5 mi S of Rt. 50 on Rt. 376, T18N R45E, 5900 ft, June 28, 1983, Schuh and Schwartz, *Grayia spinosa* (Chenopodiaceae), 110♂, 134♀ (AMNH). *Nye Co.:* Atomic Test Site, 2.6 mi W of Mercury Hwy, Cane Spgs. Rd, 3400 ft, June 6, 1983, Schuh, Schwartz, and Stonedahl, *Grayia spinosa* (Chenopodiaceae), 2♂, 13♀ (AMNH). Mercury, 401M, June 14, 1965, Beck, Knight, Merino, Paratypes: 2♂ (USNM). 5.5 mi S of Belmont on Rt. 82, 2031 m, July 13, 1980, R. T. Schuh, G. M. Stonedahl, *Atriplex* sp. (Chenopodiaceae), 9♂, 14♀ (AMNH).

Megalopsallus pallipes (Knight),
new combination
Figures 10, 14

Ankylotylus pallipes Knight, 1968: 56 (n. sp.).
Merinocapsus pallipes Schuh, 1986: 224 (n. comb., diag. figs. distr.).

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

REDESCRIPTION: *Male:* Medium sized elongate, total length 3.49–4.13, length apex clypeus–cuneal fracture 2.36–2.62, width across pronotum 0.96–1.14. **COLORATION:** Head and hemelytra pale, pronotum and scutellum partially to entirely orange-brown to brown; underside of thorax mostly pale orange, abdominal venter pale green; eyes brown; appendages largely pale orange, an-

tennae and tibiae lighter than coxae and femora; tibial spines pale with pale bases. **SURFACE AND VESTITURE:** Head, pronotum, and scutellum smooth, dull, almost powdery in appearance, hemelytra very weakly shining; dorsum clothed with pale recumbent simple setae intermixed with flattened silvery setae. **STRUCTURE:** Elongate, parallel-sided (fig. 9); labium short, reaching to about midpoint of mesosternum; claws nearly straight over much of length, curving sharply near apex, pulvilli small. **MALE GENITALIA:** Vesica relatively short, twisted, apex bifid, secondary gonopore subapical, gonopore sclerite small and weakly sclerotized (fig. 14).

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

HOSTS: *Ephedra* spp. (Ephedraceae).

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

DISTRIBUTION: Southern Nevada and Utah.

SPECIMENS EXAMINED: USA. — **Arizona:** *Coconino Co.:* 27 mi E of Jacob Lake on Rt 89 Alt., June 24, 1980, R. T. Schuh, *Ephedra torreyana* (Ephedraceae), 1♂, 2♀ (AMNH). *Mohave Co.:* Virgin River Canyon, 0.35 mi SW of milepost 24 on Hwy 15, Purgatory Canyon, 2600 ft, May 24, 1981, M. D. Schwartz, 2♂ (AMNH). **Nevada:** *Nye Co.:* 35 mi N of Tonapah, Coyote Hole Spring/Sevier Reservoir, T8 R42E S11 & 23, 6000 ft, June 30, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra* sp. (Ephedraceae), 4♀ (AMNH). Northumberland Canyon Rd, Toquima Mts, T14N R44E Sec. 31, 6400 ft, June 28, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra* sp. (Ephedraceae), 5♂, 6♀ (AMNH). Mercury, 401M, June 20, 1965, H. Knight, J. Merino, holotype: male (USNM). Mercury, TM, June 14, 1965, E. Beck, H. Knight, J. Merino, 1♀ (USNM). **Utah:** *Grand Co.:* 11 mi SE of jct. Rd 313 and Rd 163 toward Dead Horse Point, 5200 ft, June 11, 1982, M. D. Schwartz, *Ephedra viridis* (Ephedraceae), 1♂, 2♀ (AMNH). *San Juan Co.:* 1.2 mi W of Gooseneck Rd jct. on Rt. 244, 5000 ft, June 16, 1983, R. T. Schuh

and M. D. Schwartz, *Ephedra torreyana* (Ephedraceae), 3♂, 4♀ (AMNH). Glen Canyon Recreation Area, 12 mi S of Rt. 263, T40S R14E, 4300 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra torreyana* (Ephedraceae), 1♂, 5♀ (AMNH). Goosenecks Overlook, 5000 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra torreyana* (Ephedraceae), 7♂, 11♀ (AMNH). Rt. 63 at Arizona border, Monument Valley, 5200 ft, June 16, 1983, R. T. Schuh and M. D. Schwartz, *Ephedra cutleri* (Ephedraceae), 4♂, 7♀ (AMNH). *Washington Co.*: 3.5 mi E of La Verkin, June 25, 1980, R. T. Schuh, *Ephedra* sp. (Ephedraceae), 2♀ (AMNH).

***Megalopsallus parapunctipes*, new species**
 Figures 10, 15

HOLOTYPE: Male, Nevada: Eureka Co., 12 mi N of Rt. 50 on Rt 278, 5800 ft., June 27, 1983, R. T. Schuh, M. D. Schwartz, *Atriplex confertifolia* (Torr. and Frem.) S. Wats. (Chenopodiaceae). Deposited in the American Museum of Natural History.

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

DESCRIPTION: *Male:* Medium sized, total length 3.28–3.72, length apex clypeus–cuneal fracture 2.12–2.42, width across pronotum 0.91–1.00. **COLORATION:** General coloration of body and appendages pale green, including eyes; underside of thorax and abdomen often darkened in males; femora with some small dark spots; tibial spines pale with dark bases (fig. 10). **SURFACE AND VESTITURE:** Dorsum smooth, very weakly shining, clothed with pale, recumbent, simple setae intermixed with silvery, shining, weakly

flattened setae. **STRUCTURE:** Elongate, costal margins weakly convex; labium reaching to posterior margin of middle trochanters; claws elongate and smooth, curving over entire length; pulvilli small. **MALE GENITALIA:** Vesica in the form of a J, apex attenuated; gonopore delicate, subapical; no gonopore sclerite (fig. 15).

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

ETYMOLOGY: Named for its similarity of appearance to *Megalopsallus punctipes* (Knight).

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

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

PARATYPES: USA. — **California:** *Mono Co.*: 8 mi W of Nevada state line on Rt. 359, 6700 ft, July 2, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex confertifolia* (Chenopodiaceae), 8♂, 8♀ (AMNH). *Riverside Co.*: Thousand Palms, November 24, 1955, W. R. Richards, 7♂, 6♀ (CNC). *Santa Barbara Co.*: 8 mi E of New Cuyama, 2000 ft, May 10, 1985, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 12♂, 20♀ (AMNH). **Nevada:** *Eureka Co.*: 12 mi N of Rt. 50 on Rt 278, 5800 ft, June 27, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex confertifolia* (Chenopodiaceae), 68♂, 56♀ (AMNH). *Lander Co.*: 7.5 mi S of Rt. 50 on Rt. 376, 5900 ft, June 28, 1983, Schuh and Schwartz, *Atriplex confertifolia* (Chenopodiaceae), 4♂, 9♀ (AMNH). *Nye Co.*: Cumberland Canyon Road, Toquima Mts, T14N R44E, 6400 ft, June 28, 1983, R. T. Schuh and M. D. Schwartz, 3♂ (AMNH). Rock V. on Jackass Flats Road, 3300 ft, June 6, 1983, Schuh, Schwartz, Stonedahl, 2♂, (AMNH). Atomic Test Site, 6.5 mi S GS500 on Jackass Flats Rd, 3300 ft, June 6, 1983, Schuh, Schwartz, and Stonedahl, *Atriplex confertifolia* (Chenopodiaceae), 3♂, 28♀ (AMNH). Atomic Test Site, 2 mi E of Mercury Hwy on Tweezer Rd, 3800 ft, June 8, 1983, Schuh, Schwartz, and Stonedahl, *Atriplex confertifolia* (Chenopodiaceae), 26♂, 49♀ (AMNH). 2.8 mi E of Mercury Hiway on Tweezer Road, 3800 ft, June 8, 1983, Schuh, Schwartz, Stonedahl, *Atriplex confertifolia* (Chenopodiaceae), 4♂

(AMNH). **Utah:** *Uintah Co.:* 5–10 mi SW of Bonanza, T10S R24E, 5000–5600 ft, June 3, 1981, M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 12♂, 7♀ (AMNH).

Megalopsallus pictipes (Van Duzee),
new combination
Figures 11, 16

Plagiognathus pictipes (Van Duzee), 1918: 305 (n. sp.).

Psallus pictipes: Van Duzee, 1923: 161 (n. comb., list).

Psallus suaedae Knight, 1925: 34 (n. sp.); Carvalho, 1958: 127 (n. syn.).

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

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

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

HOSTS: *Allenrolfea occidentalis*, *Atriplex* sp., *Chenopodium* sp., *Sarcobatus vermiculatus*, *S. sp.*, *Suaeda fruticosa*, *S. torreyana*, *Suaeda* sp. (Chenopodiaceae). Probable sitting records: *Dondia nigra*, *D. suffrutescens*

(Apiaceae); *Haplopappus acradenius* (Asteraceae); *Lycium andersonii* (Solanaceae).

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

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

SPECIMENS EXAMINED: MEXICO. — **Baja California Norte:** 70 km S of Rosarito, sand dunes, September 8, 1977, Fisher and Westcott, 5♂ (CAS). Bahia de Los Angeles, March 31, 1973, Doyen, Szerlip, and Powell, 1♂ (UCB). **Baja California Sur:** 1–3 mi E of San Jose del Cabo, September 11, 1988, E. G. Riley, 2♂, 3♀ (TAMU). 95 km N of Loreto, April 21, 1985, R. T. Schuh and B. M. Massie, *Allenrolfea occidentalis* (Chenopodiaceae), 3♂, 3♀ (AMNH). **Baja California:** Aqua Verde, May 26, 1921, E. P. Van Duzee, 6♂, 6♀ (CAS). Econdido Bay, June 14, 1921, E. P. Van Duzee, 1♀ (CAS). El Consuelo Dunes, J. D. Pinto, 2♂, 2♀ (UCR). **Chihuahua:** Meoqui, May 30, 1964, L. A. Kelton, *Chenopodium* sp. (Chenopodiaceae), 12♂, 58♀ (CNC). **Sinaloa:** 10 mi N of Los Mochis, April 23, 1977, Hanson and Davis, 1♀ (USU). 13 mi N of Los Mochis, August 7, 1971, Chemsak and Powell, 1♀ (UCB). **USA.** — **Arizona:** *Buckeye Co.:* Buckeye, May 7, 1935, H. G. Johnston, 9♂, 13♀ (USNM). *Graham Co.:* Thatcher, June 20, 1957, E. J. Taylor, 1♂ (UCD). *Maricopa Co.:* Gila Bend, 260 m, March 26, 1981, A. F. Guenther, 1♂ (AMNH). Gila Bend, 260 m, R. T. Schuh, 1♂ (AMNH). Woolsey Wash near Painted Rock Dam, 205 m, May 9, 1978, R. T. Schuh and A. F. Guenther, *Salsola* sp. (Chenopodiaceae), 16♂, 30♀ (AMNH). *Mohave Co.:* Bullhead City, August 19, 1974, L. A. Lacey, 1♀ (UCR). *Pima Co.:* Tucson, Santa Cruz River, July 21, 1917, H. H. Knight, 3♂, 5♀ (CAS, CNC, USNM). Tucson, Santa Cruz River, July 22, 1917, H. H. Knight, Paratypes: 6♂, 6♀ (USNM). Tucson, 2400 ft, March 30, 1926, A. A. Nichol, 1♂, 1♀ (USNM). Tucson, *Dondia suffrutescens* (Apiaceae), 2♀ (UCR). Quitoba-

quito, Organ Pipe Cactus National Mon., April 3, 1966, L. and C. W. O'Brien, 4♂, 1♀ (UCB). *Pinal Co.*: Coolidge, April 9, 1942, L. L. Stitt, 1♂ (USNM). *Yuma Co.*: Dome, April 6, 1978, J. D. Pinto, 4♂, 4♀ (UCR). **California**: *Alameda Co.*: Niles Canyon, July 15, 1917, E. P. Van Duzee, 1♂, 1♀ (CAS). *Imperial Co.*: Pothole, April 12, 1923, E. P. Van Duzee, *Lycium andersonii* (Solanaceae), 1♂ (USNM). 1 mi E of Coyote Wells, April 23, 1980, M. D. Schwartz, *Suaeda* sp. (Chenopodiaceae), 1♂, 7♀ (AMNH). 15 mi NW of Westmorland, January 8, 1977, J. D. Pinto, 3♂, 3♀ (UCR). 3 mi S of Palo Verde, April 8, 1963, D. E. Bright, 3♂, 11♀ (UCB). Brawley, March 18, 1964, R. A. Flock, *Suaeda fruticosa* (Chenopodiaceae), 2♂ (USNM). Coachella, May 13, 1917, E. P. Van Duzee, 1♂ (USNM). Potholes, April 12, 1923, E. P. Van Duzee, 4♂, 2♀ (CAS). Coachella, May 13, 1917, E. P. Van Duzee, Paratypes: 1♂, 3♀ (CAS). *Inyo Co.*: 1 mi NW of Keeler, May 11, 1969, J.D. Haddock, 2♂, 9♀ (UCB). Argus Mts, April 1, 1891, Koebele, 1♀ (USNM). Death Valley Natl. Mon., Furnace Creek Wash, March 26, 1982, L. Russell, 2♂, 6♀ (AMNH). Death Valley Natl. Mon., Stovepipe Wells Dunes, sea level, March 24, 1982, L. Russell, 8♂, 11♀ (AMNH). Death Valley, 2♂ (USNM). Eureka Valley, 0.5 mi W of Dunes, May 4, 1977, J. D. Pinto, *Salsola* sp. (Chenopodiaceae), 4♂, 5♀ (UCR). *Orange Co.*: Santa Ana, June 10, 1936, C. E. Norland, 1♀ (LACM). *Riverside Co.*: Willis Palms Oasis, Thousand Palms, April 4, 1955, W. R. Richards, *Atriplex* sp. (Chenopodiaceae), 19♂, 8♀ (CNC). Thousand Palms, April 23, 1955, W. R. Richards, 4♀ (CNC). *San Bernardino Co.*: Rabbit Dry Lake, 2 mi W of Lucerne Valley, 935 m, May 13, 1978, R. T. Schuh and J. D. Pinto, *Salsola* sp. (Chenopodiaceae), 1♂, 10♀ (AMNH). Baker, 920 ft, April 5, 1966, R. O. Schuster, 2♀ (UCD). Needles, December 17, 1921, J. A. Kusche, 3♂ (CAS). *San Diego Co.*: Anza-Borrego State Park, Vallecito Canyon, April 23, 1980, M. D. Schwartz, *Haplopappus acradenius* (Asteraceae), 2♂, 18♀ (AMNH). N end of Borego-Clark Lake, March 25, 1978, Wasbauer et al., 2♀ (CAFA). **Colorado**: *Delta Co.*: Delta, July 20, 1898, E. D. Ball, 1♀ (UAZ). Delta, July 20, 1898, P. R. Uhler Collection, 1♂ (USNM). *Garfield Co.*: Rifle, August 25, 1968, L. A. Kelton, 1♂, 8♀ (CNC). *Mesa Co.*: Grand Junction, July 27, 1900, 3♂, 4♀ (CAS). Grand Junction, July 28, 1900, 2♀ (USNM). **Nevada**: *Clark Co.*: Las Vegas, April 27, 1931, E.W. Davis, 2♀ (USNM). Overton, September 19, 1929, D. E. Fox, *Dondia nigra* (Apiaceae), 1♀ (USNM). *Pershing Co.*: Woolsey RR Station, June 6, 1973, T. R. Haig, 1♂ (CAFA). *Washoe Co.*: 38 mi S of Gerlach, June 17, 1966, W. Gagne, 2♀ (CNC, USNM). **New Mexico**: *Chaves Co.*: Roswell, Pecos River, July 22, 1967, L. A. Kelton, 2♀ (CNC). *Dona Ana Co.*: Mesilla Park, July 12, 1917, H. H. Knight, Paratypes: 1♂, 1♀ (USNM). *Eddy Co.*: Carlsbad, May 30, 1979, T. P. Friedlander, 1♀ (TAMU). June 19, 1979, D. R. Dolorme and H. L. Corrola, 4♀ (TAMU). *Hidalgo Co.*: Lordsburg, July 13, 1917, H. H. Knight, 1♀ (USNM). **Oregon**: *Harney Co.*: T36S R35E, July 3, 1979, Lightfoot and Cobb, 2♀ (OSU). **Texas**: ?? *Co.*: Cedar Lake, August 9, 1928, J. G. Shaw, 1♂ (KU). *Cameron Co.*: Big Bend Natl. Park, Santa Elena, 2200 ft, March 21, 1959, Howden and Becker, 15♂, 7♀ (CNC). Brownsville, May 10, 1930, R. L. McGarr, 2♂, 7♀ (USNM). *El Paso Co.*: El Paso, July 23, 1914, J. C. Bradley, Paratypes: 2♂, (USNM). *Hidalgo Co.*: Bentsen-Rio Grande Valley St. Pk, April 21, 1984, L. G. and T. P. Friedlander, 1♂ (TAMU). Texas Experiment Station, May 20, 1930, J. C. Gaines, 1♀ (USNM). *Presidio Co.*: Presidio, May 9, 1954, 6♂, 2♀ (USNM). Presidio, September 28, 1929, W. L. Owens, 7♂, 8♀ (USNM). *Walker Co.*: Loma, December 11, 1910, 1♀ (USNM). **Utah**: *Emery Co.*: 2 mi N of I-70 on Rt. 6, August 12, 1987, D. A. Rider, 8♂, 12♀ (DAR). *Grand Co.*: Colorado River Canyon near Fischer Towers, 4000 ft, May 27, 1978, D. A. and J. T. Polhemus, 1♀ (JTP). East of Moab, Colorado River Bridge, May 26, 1979, J. T. and D. A. Polhemus, 17♂, 13♀ (JTP). *Uintah Co.*: 5–10 mi SW of Bonanza, 5000–5600 ft, June 8, 1982, M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♀ (AMNH). *Washington Co.*: St. George, 2800 ft, May 24, 1981, M. D. Schwartz, *Suaeda torreyana* (Chenopodiaceae), 24♂, 78♀ (AMNH).

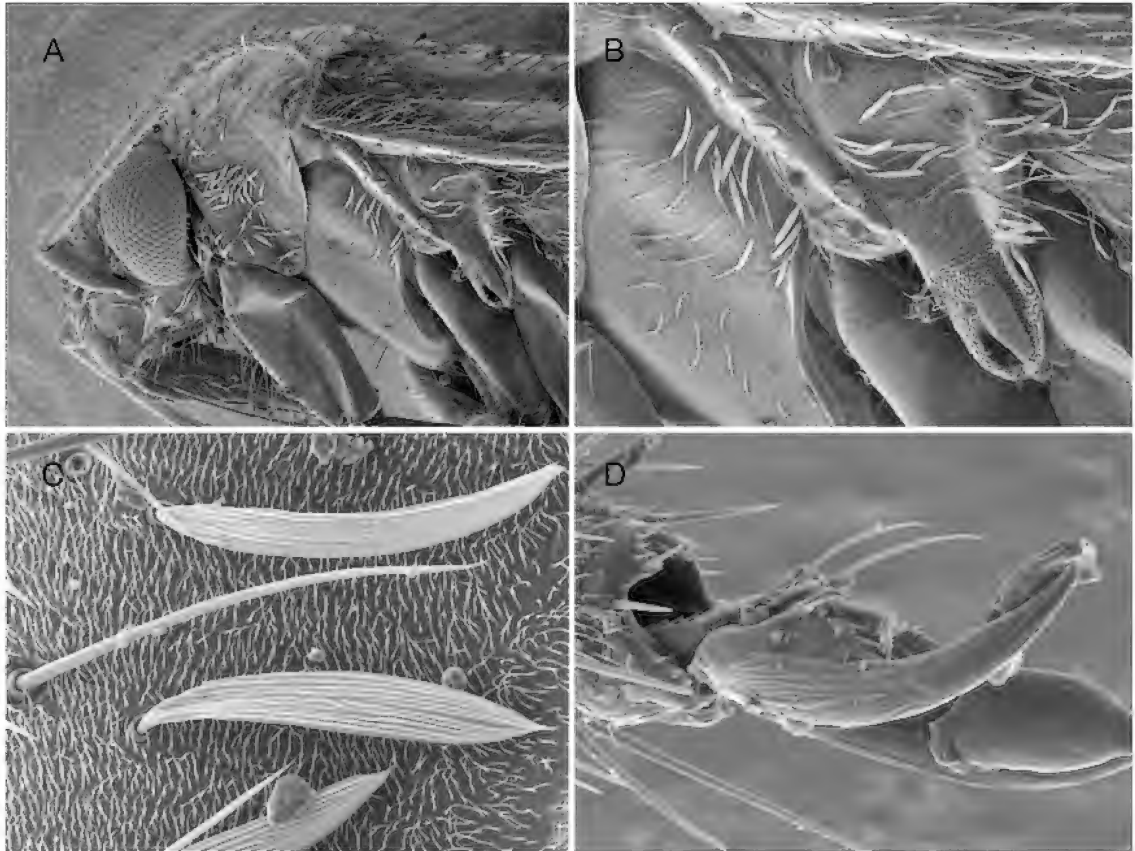


Fig. 19. *Megalopsallus punctatus*, female, scanning micrographs. **A.** Lateral view of head and thorax. **B.** Mesothoracic spiracle and metathoracic scent gland evaporatory area. **C.** Detail of setae comprising dorsal vestiture. **D.** Lateral view of pretarsus.

Megalopsallus punctatus,
new name, new combination
Figures 11, 16, 19

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

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

REDESCRIPTION: *Male:* Moderately large, robust, total length 3.78–4.15, length apex clypeus–cuneal fracture 2.47–2.70, width across pronotum 1.16–1.27. **COLORATION:** Entire body and appendages cream colored, including eyes, with a slight tinge of green, dorsum with small brown spots at the bases of simple setae; femora with some small

brown spots; tibial spines pale with small dark bases (fig. 11). **SURFACE AND VESTITURE:** Dorsum smooth, very weakly shining, clothed with pale, reclining, simple setae intermixed with silvery, shining, weakly flattened setae (fig. 19C). **STRUCTURE:** Hemelytra relatively elongate, nearly parallel-sided (fig. 11); labium reaching to between middle and hind coxae; claws elongate and smoothly curving; pulvilli minute (fig. 19D). **MALE GENITALIA:** Vesica J-shaped, weakly twisted, apex very slightly attenuated past gonopore; gonopore sclerotized; no gonopore sclerite (fig. 16).

Female: Total length 3.16–3.29, length apex clypeus–cuneal fracture 2.27–2.40, width across pronotum 1.19–1.28; relatively heavy-bodied, ovoid, not so elongate as male (fig. 11).

ETYMOLOGY: From the Latin, *punctum*, hole or spot, for the brown spots at the bases of the setae on the dorsum.

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

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

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

SPECIMENS EXAMINED: USA. — **Arizona:** *Cochise Co.:* Portal, 1500 m, June 15, 1980, R. T. Schuh and K. Schmidt, *Atriplex* sp. (Chenopodiaceae), 3 ♀ (AMNH). *Coconino Co.:* Rt. 64 just SE of Grand Canyon Natl. Park, June 26, 1980, K. & R. Schmidt, *Atriplex canescens* (Chenopodiaceae), 3 ♂ (AMNH). **Nevada:** *Lyon Co.:* North boundary Toiyabe Nat Forest on Hiway 22, 5700 ft, July 11, 1980, G. M. Stonedahl, 7 ♂, 6 ♀ (AMNH). *Nye Co.:* Atomic Test Site, 16M, July 24, 1965, H. H. Knight and J. Merino, *Atriplex canescens* (Chenopodiaceae), 2 ♀ (USNM). **New Mexico:** *Dona Ana Co.:* 9 mi W of Santa Teresa, May 8, 1999, J. C. Schaffner, 5 ♀ (TAMU). **Texas:** *Culberson Co.:* 2 mi W of Kent on I-10, 1550 m, April 27, 1978, R. T. Schuh and T. J. Henry, *Atriplex* sp. (Chenopodiaceae), 1 ♀ (AMNH). 38 mi N of Van Horn, 1220 m, April 28, 1978, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 4 ♂, 7 ♀ (AMNH). Van Horn, 1440 m, April 28, 1978, R. T. Schuh and T. J. Henry, *Atriplex* sp. (Chenopodiaceae), 14 ♂, 16 ♀ (AMNH).

Megalopsallus punctipes (Knight)

Figures 11, 16, 20

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

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

DIAGNOSIS: Recognized, in common with *parapunctipes* and *sarcobati*, by generally

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

REDESCRIPTION: *Male:* Medium sized, total length 2.91–4.12, length apex clypeus–cuneal fracture 1.93–3.16, width across pronotum 0.92–0.99. COLORATION: Entire body and appendages pale, greenish white; femora with scattered small brown spots (fig. 11); tibial spines pale with small brown bases. SURFACE AND VESTITURE: Dorsum smooth, weakly shining, clothed with reclining, brown, simple setae and silvery woolly setae (fig. 20C). STRUCTURE: Moderately elongate, corial margins weakly convex (fig. 11); labium short, reaching point midway between fore and middle trochanters; claws elongate and curving; pulvilli small, covering about one-half of ventral claw surface (fig. 20D). MALE GENITALIA: Vesica in the form of a J, not twisted, apex membranous; gonopore small, conspicuously subapical; no gonopore sclerite (fig. 16).

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

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

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

SPECIMENS EXAMINED: MEXICO. — **Baja California Norte:** El Crucero, April 4, 1976, P. Rude, *Atriplex* sp. (Chenopodiaceae), 7 ♂ (UCB). USA. — **Arizona:** *Graham Co.:* 30 mi SE of Globe on Rt. 70, 3200 ft, May 31, 1983, R. T. Schuh and G. M. Stonedahl, *Atriplex* sp. (Chenopodiaceae), 4 ♂, 5 ♀ (AMNH). **California:** *Imperial Co.:* 1 mi E of Coyote Wells, E of intersection of Rts 580 & I-8, April 23, 1980, M. D. Schwartz and

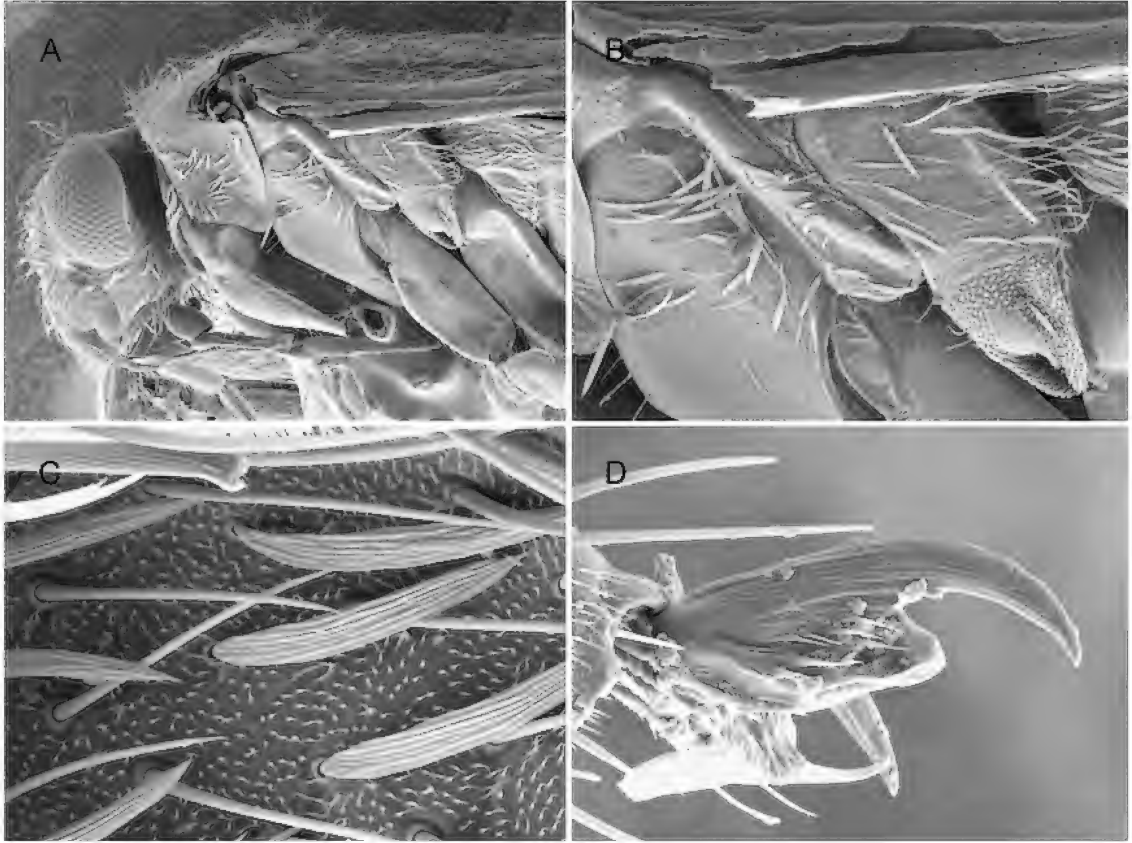


Fig. 20. *Megalopsallus punctipes*, female, scanning micrographs. **A.** Lateral view of head and thorax. **B.** Mesothoracic spiracle and metathoracic scent gland evaporatory area. **C.** Detail of setae comprising dorsal vestiture. **D.** Lateral view of pretarsus.

L. Russell, *Atriplex* sp. (Chenopodiaceae), 1♂, 5♀ (AMNH). Imperial near RR tracks on Rt. 580, 42 ft, April 23, 1980, M. D. Schwartz and L. Russell, *Atriplex* sp. (Chenopodiaceae), 24♂, 27♀ (AMNH). *Inyo Co.*: 2 mi E of Westgard Pass Summit, White Mts, 2125 m, July 2, 1980, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 2♂, 16♀ (AMNH). 10 mi NE of Bishop, June 21, 1978, J. D. Pinto, *Atriplex* sp. (Chenopodiaceae), 1♂, 4♀ (UCR). *Riverside Co.*: 5 mi E of Mecca, Box Canyon Wash, April 6, 1979, J. D. Pinto, *Atriplex* sp. (Chenopodiaceae), 3♂, 4♀ (UCR). *San Bernardino Co.*: Rabbit Dry Lake, 2 mi W of Lucerne Valley, 935 m, May 13, 1978, R. T. Schuh and J. D. Pinto, *Atriplex* sp. (Chenopodiaceae), 1♂, 7♀ (AMNH, UCR). *San Diego Co.*: Anza-Borrego State Park, Vallecito Canyon, April 23, 1980, M. D. Schwartz, *Atriplex* sp. (Cheno-

podaceae), 8♂, 15♀ (AMNH). **Nevada:** *Clark Co.*: 7 mi S of Boulder City, 530 m, May 17, 1978, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 1♂ (AMNH). *Esmeralda Co.*: 13 mi W of Lida on Rt. 3, 1938 m, July 12, 1980, R. T. Schuh and G. M. Stonedahl, *Atriplex* sp. (Chenopodiaceae), 5♀ (AMNH). *Nye Co.*: Mercury, 410M(TB), July 21, 1965, E. Beck and J. Merino, Paratypes: 1♂ (USNM). 5.5 mi S of Belmont on Rt. 82, 2031 m, July 13, 1980, R. T. Schuh and G. M. Stonedahl, *Atriplex* sp. (Chenopodiaceae), 1♀ (AMNH). Mercury, CM, June 13, 1965, D. E. Beck and H. Knight, *Atriplex canescens* (Chenopodiaceae), Paratypes: 2♂ (USNM). Rock V. on Jackass Flats Road, 3300 ft, June 6, 1983, Schuh, Schwartz, Stonedahl, *Atriplex canescens* (Chenopodiaceae), 4♂, 13♀ (AMNH). Mercury, 18m, July 7, 1965, E. Beck and J. Merino, *Atriplex*

canescens (Chenopodiaceae), Paratypes: 4♂ (USNM, CNC). 6.8 mi SE of Mercury on Orange Blossom Road, Atomic Test Site, 4000 ft, June 8, 1983, Schuh, Schwartz, Stonedahl, *Atriplex canescens* (Chenopodiaceae), 1♂, 4♀ (AMNH). Atomic Test Site, Mercury Hwy at Angle Rd, 3800 ft, June 8, 1983, Schuh, Schwartz, and Stonedahl, *Atriplex canescens* (Chenopodiaceae), 4♂, 5♀ (AMNH). Mercury, 18m, June 23, 1965, H. Knight and J. Merino, *Atriplex canescens* (Chenopodiaceae), Paratypes: 1♂ (USNM). **New Mexico:** *Dona Ana Co.:* 20 mi N of Las Cruces, 1280 m, April 30, 1978, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 1♀ (AMNH). E of Las Cruces, base of Organ Mts, 1600 m, R. T. Schuh and J. Zimmerman, *Atriplex* sp. (Chenopodiaceae), 1♂, 1♀ (AMNH). Las Cruces, 1220 m, April 30, 1978, R. T. Schuh and J. Zimmerman, *Atriplex* sp. (Chenopodiaceae), 1♂, 2♀ (AMNH). **Oregon:** *Harney Co.:* T34S R35E Sec 10 NE, June 22, 1979, Neil Cobb, *Atriplex canescens* (Chenopodiaceae), 1♂ (AMNH). **Texas:** *Culberson Co.:* 38 mi N of Van Horn, 1220 m, April 28, 1978, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 2♀ (AMNH). Van Horn, 1440 m, April 28, 1978, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 1♀ (AMNH). **Utah:** *Emery Co.:* 2.5 mi W of Rt 24 on Goblin Valley Road, 5500 ft, June 19, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 6♂, 1♀ (AMNH). *Garfield Co.:* 14.3 mi S of Rt. 95 on Rt. 276, 5000 ft, June 19, 1983, R. T. Schuh and M. D. Schwartz, 36♂, 3♀ (AMNH). *Grand Co.:* 11 mi SE of jct. Rts 313 & 163 toward Dead Horse Point, 5200 ft, June 11, 1982, M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 23♂, 6♀ (AMNH). *Millard Co.:* Longridge Reservoir Cutoff on Rt. 50/6, 4500 ft, May 19, 1982, M. D. Schwartz, *Atriplex confertifolia* (Chenopodiaceae), 8♂, 7♀ (AMNH). *San Juan Co.:* 3 mi SE of Rt. 263 on Clay Hills Crossing Rd, 4700 ft, June 18, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 1♂, 3♀ (AMNH). 7.7 mi N of Mexican Hat on Rt. 261, 5000 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 1♂, 3♀ (AMNH).

Megalopsallus rubricornis (Knight)

Figures 11, 16

Europiella rubricornis Knight, 1968: 39 (n. sp.).
Megalopsallus rubricornis: Schuh et al., 1995: 389 (n. comb.).

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

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

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

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

DISTRIBUTION: Southern Oregon south to Arizona and east to Utah.

SPECIMENS EXAMINED: USA. — **Arizona:** *Gila Co.:* Salt River Mts., 1300 ft, May 9, 1926, A. A. Nichol, 1 ♀ (USNM). **California:** *Inyo Co.:* 1 mi NW of Keeler, May 11, 1969, J. Doyen, 2 ♂, 6 ♀ (UCB). Owens Lake Sand Dunes, May 17, 1978, Guiliani, 3 ♂, 3 ♀ (CAFA). 2 mi E of Big Pine, June 22, 1978, J. D. Pinto, *Sarcobatus* sp. (Chenopodiaceae), 2 ♀ (UCR). *Lassen Co.:* Litchfield, June 22, 1937, B. P. Bliven, 2 ♂, 1 ♀ (CAS). *Mono Co.:* 1 mi S of Bridgeport, July 9, 1973, J. D. Pinto, *Sarcobatus* sp. (Chenopodiaceae), 1 ♂, 1 ♀ (UCR). 8 mi W of Nevada state line on Rt. 359, 6700 ft, July 3, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 64 ♂, 113 ♀ (AMNH). *San Bernardino Co.:* 1.3 mi S of Goffs, 845 m, May 16, 1978, R. T. Schuh, 1 ♂ (AMNH). *Siskiyou Co.:* 5 mi S of Merrill, Oregon, 4060 ft, June 26, 1979, M. D. Schwartz, G. M. Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 34 ♂, 29 ♀ (AMNH). East side of Lower Klamath Lake, 1270 m, June 26, 1979, R. T. and Joe Schuh, *Sarcobatus vermiculatus* (Chenopodiaceae), 38 ♂, 45 ♀ (AMNH). **Nevada:** *Clark Co.:* 5.8 mi W of Valley of Fire State Park, 845 m, May 17, 1978, R. T. Schuh, 1 ♂ (AMNH). *Elko Co.:* Utah state line on Utah Rt. 30, 4760 ft, June 25, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 11 ♂, 12 ♀ (AMNH). *Humboldt Co.:* Winnemucca, June 1, 1968, T. R. Haig, 1 ♂ (CAS). *Lander Co.:* 11 mi S of Rt. 50 on Rt. 376, 5800 ft, June 28, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 19 ♂, 41 ♀ (AMNH). *Lyon Co.:* 7 mi N of Sweetwater Summit on Rt. 22, Toiyabe Natl. Forest, 1856 m, July 11, 1980, R. T. Schuh and G. M. Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 22 ♂, 25 ♀ (AMNH). *Nye Co.:* 28 mi N of Belmont on Rt. 82, 2113 m, July 13, 1980, R. T. Schuh and G. M. Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 9 ♂, 16 ♀ (AMNH). *Washoe Co.:* 2 mi N of Vya on Rt. 8A, 1750 m, July 2, 1979, R. T. Schuh and B. M. Massie, *Sarcobatus vermiculatus* (Chenopodiaceae), 10 ♂, 4 ♀ (AMNH). Nixon, June 30, 1927, E. P. Van Duzee, 1 ♂ (CAS). Pyramid Lake, June 27, 1972, R. A. Belmont, 1 ♀ (UCD). **Oregon:** *Baker Co.:* Anthony Lake, July 11,

1931, Nottingham, 1 ♀ (KU). *Harney Co.:* Malheur Wildlife Refuge, 10 mi S of headquarters, July 12, 1968, P. Oman, 1 ♂ (OSU). T36S R35E, July 3, 1979, Smith and Cobb, 2 ♂ (OSU). *Union Co.:* La Grande, June 26, 1926, E. W. Davis, 1 ♀ (USNM); 1 ♀ (USNM). **Utah:** *Cache Co.:* Benson, June 28, 1932, Knowlton and Stains, 1 ♀ (USNM). *Millard Co.:* White Valley, June 8, 1940, R. W. Fautin, 1 ♀ (USNM). *Sevier Co.:* Monroe, July 25, 1900, 1 ♀ (USNM). Richfield, August 15, 1929, Paratypes: 4 ♂ (USNM). Richfield, July 15, 1929, E. W. Davis, Paratypes: 4 ♂ (USNM).

Megalopsallus rubropictipes Knight

Figures 12, 16

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

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

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

Female: Total length 2.50–3.41, length apex clypeus–cuneal fracture 2.14–2.45, width across pronotum 0.98–1.16; usually

macropterous and slightly more robust than male, sometimes brachypterous, with hemelytra greatly shortened with apex of abdomen projecting beyond posterior margin of reduced membrane (fig. 12).

HOSTS: *Atriplex confertifolia*, *A. sp.*, *Salicornia sp.*, *Suaeda erecta*, *S. sp.* (Chenopodiaceae).

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

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

SPECIMENS EXAMINED: CANADA. — **Alberta:** 1-4, July 17, 1952, A. R. Brooks, *Suaeda erecta* (Chenopodiaceae), 4♂ (CNC). Castor, August 7, 1957, A. R. and J. E. Brooks, *Atriplex sp.* (Chenopodiaceae), 5♂, 3♀ (CNC). Drumheller, August 11, 1957, A. R. and J. E. Brooks, 5♂, 6♀ (CNC). Irvine, June 11, 1952, A. R. Brooks and L. A. Konotopetz, 2♀ (CNC). **Saskatchewan:** Minton, August 11, 1955, A. R. Brooks, 1♂, 1♀ (CNC). Val Marie, A. R. Brooks, 1♂, 2♀ (CNC). Elbow, August 17, 1951, A. R. Brooks, *Suaeda sp.* (Chenopodiaceae), 5♂, 3♀ (CNC). Wood Mountain, August 5, 1955, A. R. Brooks, 8♂, 11♀ (CNC). USA. — **Arizona:** *Cochise Co.:* 3 mi SW of Portal, August 25, 1987, D. A. Rider, 3♂ (DAR). 6 mi SE of Wilcox, July 28, 1952, M. Cazier, R. Schrammel, 1♀ (AMNH). Douglas, August 25, 1968, 1♂ (AMNH). Fairbanks, San Pedro River, September 6, 1927, J. A. Kusche, 3♂ (CAS). Huachuca Mts, 5354 Ash Canyon Road. 0.5 mi W of Hwy 92, 5100 ft, October 18, 1992, N. McFarland, 16♂, 3♀ (USNM). *Santa Cruz Co.:* Patagonia, on Sonoita Creek, October 14, 1927, J. A. Kusche, 1♂, 1♀ (CAS). **Colorado:** *Delta Co.:* Delta, July 20, 1898, P.R. Uhler Collection, 1♀ (USNM). *Fremont Co.:* Florence August 17, 1925, H. H. Knight, Paratype: 1♂ (CNC). *Garfield Co.:* Rifle, August 25, 1968, L. A. Kelton, 10♂, 50♀ (CNC, AMNH). *Las Animas Co.:* Delhi, August 6, 1925, H. H. Knight, 1♂ (USNM). Trinidad, September 12, 1898, Paratypes: 1♂, 1♀ (USNM). *Montezuma Co.:* 4 mi E of Cortez, August 16, 1973, J. C. Schaff-

ner, 3♂, 8♀ (TAMU). Cortez, July 19, 1968, L. A. Kelton, *Salicornia sp.* (Chenopodiaceae), 2♂, 17♀ (CNC). *Otero Co.:* Rocky Ford, September 4, 1898, Paratypes: 1♂ (USNM). *Pueblo Co.:* Pueblo, September 15, 1898, 1♂ (USNM). **Montana:** *Yellowstone Co.:* Billings, August 4, 1927, H. H. Knight, 1♂, 1♀ (CNC). **Nevada:** *Elko Co.:* Elko, July 12, 1965, H. H. Knight, 1♂ (CNC). *Eureka Co.:* 12 mi N of Rt. 50 on Rt 278, 5800 ft, June 27, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex confertifolia* (Chenopodiaceae), 8♀ (AMNH). *Lincoln Co.:* Cathedral Gorge State Park, June 17, 1986, J.B. Knight and K.R. Helms, 1♂, 1♀ (AMNH). *Nye Co.:* 2.5 mi NE of Gabbs off Rt. 844, Rifle Range, 4800 ft, July 2, 1983, R. T. Schuh and M. D. Schwartz, 16♂, 3♀ (AMNH). *Pershing Co.:* Woolsey RR Station, June 5, 1973, T. R. Haig, 2♀ (CAFA). **New Mexico:** *Chaves Co.:* Roswell, Pecos River, July 21, 1967, L. A. Kelton, 2♂, 4♀ (CNC). Roswell, Bottomless Lakes, July 21, 1967, L. A. Kelton, 7♂, 7♀ (CNC). *Eddy Co.:* 32°21.4'N 103°46.9'W (Campsite), May 29, 1979, D. R. Dolorme and H. L. Corolla, 12♂, 10♀ (TAMU). Carlsbad, May 29, 1979, T. P. Friedlander, 4♂ (TAMU). July 26, 1979, D. R. Dolorme and C. P. McHugh, 1♀ (TAMU). *San Juan Co.:* Chaco Canyon Natl. Mon., August 9, 1932, S. E. Wood, 2♂ (LACM). *Santa Fe Co.:* 8 mi E of Los Alamos, July 4, 1982, D. A. and J. T. Polhemus, 1♂, 1♀ (JTP). **Oregon:** *Harney Co.:* T34S R35E, August 27, 1979, Smith and Cobb, 1♂ (OSU). **Utah:** *Box Elder Co.:* Snowville, July 29, 1971, G. F. Knowlton, 1♂, 3♀ (USU). Cedar Hill, August 17, 1972, G. F. Knowlton, 1♂ (USU). S. Validation Site, August 17, 1972–August 24, 1972, Hanson and Knowlton, 25♂, 16♀ (USU). *Cache Co.:* Logan, August 19, 1939, G. F. Knowlton, 2♂ (USU). *Millard Co.:* Delta, June 16, 1968, G. F. Knowlton, 1♂ (USU). *Sevier Co.:* Richfield, July 15, 1929–September 20, 1927, E. W. Davis, 2♂, 6♀ (USNM). Richfield, July 8, 1930, 1♂, 1♀ (USNM). *Weber Co.:* Slaterville, July 12, 1967, Knowlton and Frank, 4♂, 2♀ (OSU).

Megalopsallus sarcobati (Knight)

Figures 12, 16, 21

Europiella sarcobati Knight, 1969: 83 (n. sp.).
Megalopsallus sarcobati: Schuh et al., 1995: 389 (n. comb.).

Europiella multipunctipes Knight, 1970: 229 (n. sp.). NEW SYNONYMY.

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

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

REDESCRIPTION: *Male:* Moderately small, broad-bodied, total length 3.04–3.26, length apex clypeus–cuneal fracture 2.05–2.22, width across pronotum 1.01–1.08. **COLORATION:** Pale green (often dirty yellow in poorly preserved specimens); eyes pale (fig. 12); femora with numerous small brown spots; tibial spines pale with brown bases. **SURFACE AND VESTITURE:** Dorsum smooth, weakly shining, clothed with pale or light brown setae intermixed with silvery, slightly flattened setae (fig. 21C). **STRUCTURE:** Relatively broad bodied and ovoid; head short and broad, eyes relatively small (fig. 12); labium reaching to about posterior margin of middle trochanters; claws elongate, nearly straight over two-thirds of length, curving apically; pulvilli moderately large, covering about two-thirds of ventral claw surface (fig. 21D). **MALE GENITALIA:** Vesica S-shaped, sclerotized and attenuated apically, gonopore subapical; gonopore sclerite well developed (fig. 16).

Female: Total length 2.92–3.34, length apex clypeus–cuneal fracture 2.13–2.45, width across pronotum 1.07–1.21; ovoid, often difficult to separate from male as viewed from above (fig. 12).

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

DISTRIBUTION: Interior western North America from southern Washington south to southern Nevada and east to Colorado.

DISCUSSION: Examination of the material upon which Knight (1970) based his original description of *multipunctipes* indicates that this nominal taxon is the same as *sarcobati*, and I am therefore treating it as a junior synonym. Knight noted that his specimens of *multipunctipes* “were from a shrub I thought

must be an *Atriplex*.” All verified host records for this species are from *Sarcobatus*, Knight’s observation apparently being in error. The single record from *S. baileyi* is the exception among the many known occurrences on *S. vermiculatus*.

SPECIMENS EXAMINED: USA. — **Arizona:** *Coconino Co.:* 1 mi E of Tuba City on Rt. 163, 5000 ft, June 16, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♂, 9♀ (AMNH). Red Lake on Rt. 160, June 26, 1980, K. & R. Schmidt, *Sarcobatus vermiculatus* (Chenopodiaceae), 6♂, 17♀ (AMNH). **California:** *Inyo Co.:* 1 mi NW of Keeler, May 11, 1969, J. D. Haddock, 4♂, 12♀ (UCB). 2 mi E of Big Pine, June 3, 1975, J. D. Pinto, 4♀ (UCR). *Modoc Co.:* ca. 4 mi E of Cedarville, 1440 m, July 2, 1979, R. T. Schuh and B. Massie, *Sarcobatus vermiculatus* (Chenopodiaceae), 3♀ (AMNH). *Mono Co.:* 1.3 mi N of Oasis, Fish Lake Valley, June 10, 1976, J. D. Pinto, 1♂, 3♀ (UCR). 8 mi W of Nevada state line on Rt. 359, 6700 ft, July 2, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 9♂, 15♀ (AMNH). *Siskiyou Co.:* 5 mi S of Merrill, Oregon, 4060 ft, June 26, 1979, M. D. Schwartz and G. M. Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 30♂, 37♀ (AMNH). Dorris, July 1, 1935, R. H. Beamer, 2♂ (KU). East side of Lower Klamath Lake, 1270 m, June 29, 1979, R. T. and Joe Schuh, *Sarcobatus vermiculatus* (Chenopodiaceae), 34♂, 64♀ (AMNH). **Colorado:** *Mesa Co.:* E of Palisade, Plateau Creek, June 6, 1981, J. T. Polhemus, 1♂ (JTP). *Mineral Co.:* Creede, June 21, 1990, J. T. and D. A. Polhemus, 1♀ (JTP). *Moffat Co.:* Gates of Lodore, June 28, 1979, D. A. Polhemus, 4♂, 16♀ (JTP). **Nevada:** *Elko Co.:* Wells, July 12, 1965, H. H. Knight, 4♂ (USNM). Elko, July 12, 1965, H. H. Knight, 13♀ (USNM). Utah state line on Utah Rt. 30, 4760 ft, June 25, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 140♂, 140♀ (AMNH). *Esmeralda Co.:* 13 mi W of Lida on Rt. 3, 1938 m, July 13, 1980, R. T. Schuh and G. M. Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 3♀ (AMNH). *Lander Co.:* Battle Mt., June 26, 1935, R. H. Beamer, 3♀ (KU). 11 mi S of Rt. 50 on Rt. 376, T17N R44E, 5800 ft, June

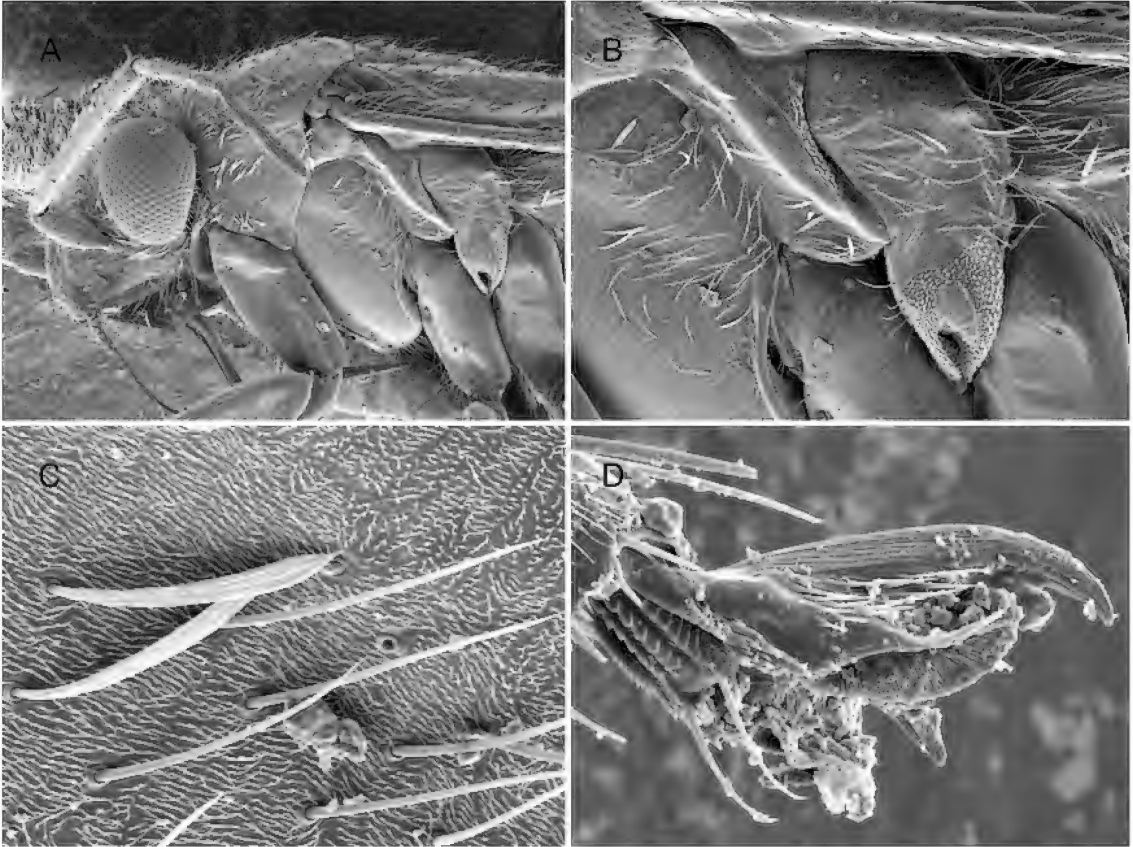


Fig. 21. *Megalopsallus sarcobati*, male, scanning micrographs. **A.** Lateral view of head and thorax. **B.** Mesothoracic spiracle and metathoracic scent gland evaporatory area. **C.** Detail of setae comprising dorsal vestiture. **D.** Lateral view of pretarsus.

28, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 20♂, 50♀ (AMNH). *Lyon Co.*: 7 mi N of Sweetwater Summit on Rt. 22, Toiyabe Natl. For., 1865 m, July 11, 1980, R. T. Schuh and G.M Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 10♂, 30♀ (AMNH). *Nye Co.*: 28 mi N of Belmont on Rt. 82, 2013 m, July 13, 1980, R. T. Schuh and G. M. Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 10♂, 14♀ (AMNH). 35 mi N of Tonopah, Coyote Hole Spring/Sevier Reservoir, T8 R42E S11 & 23, 6000 ft, June 30, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus baileyi* (Chenopodiaceae), 1♂, 5♀ (AMNH). *Washoe Co.*: 2 mi E of Vya on Rt. 8A, 1750 m, July 2, 1979, R. T. Schuh and B. M. Massie, *Sarcobatus vermiculatus* (Chenopodiaceae), 18♂, 17♀ (AMNH). **Oregon:** *Harney Co.*: Alvord De-

sert, T34S R37E, Sec 10, June 20, 1980, Oman, 1♀ (OSU). *Union Co.*: La Grande, June 26, 1926, E. W. Davis, Paratypes: 3♂, 5♀ (USNM). **Utah:** *Millard Co.*: White Valley, May 24, 1940, 1♀ (USNM). *Uintah Co.*: 5–10 mi SW of Bonanza, 5000–5600 ft, June 8, 1982, M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 12♂, 17♀ (AMNH). Bonanza, White River Shale Project, T9S R24E Sec 23, 5000 ft, June 1, 1981, M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 26♂, 30♀ (AMNH). **Washington:** *Yakima Co.*: Yakima, June 19, 1932, A. R. Rolfs, Paratypes: 6♂, 5♀ (USNM).

Megalopsallus schwartzi, new species
Figures 12, 16

HOLOTYPE: Male, Nevada: Nye Co., 35 mi. N of Tonopah, Coyote Hole Spg./Sevier

Resrvr., T8N R42E, S 11 & 23, June 30, 1983, Schuh, Schwartz, *Sarcobatus vermiculatus* (Hook.) Torr. var. *baileyi* (Cov.) Jeps. (Chenopodiaceae). Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by elongate slender body form in male, entirely pale greenish white coloration, red eyes (fig. 12), and lack of brown spots on femora and tibiae. Commonly collected with *atriplicis* and *sarcobati*, but distinguished from former by that species having red spots on head and pronotum and from latter by that species having pale eyes, brown spots on femora, and more robust body form.

DESCRIPTION: *Male:* Moderate-sized, slender, total length 3.46–3.70, length apex clypeus–cuneal fracture 2.26–2.37, width across pronotum 0.96–1.03. **COLORATION:** Pale, nearly white, pronotum and scutellum weakly orange, hemelytra weakly greenish; eyes red or white (fig. 12); tibial spines pale with pale bases. **SURFACE AND VESTITURE:** Dorsum smooth, weakly shining, clothed with recumbent, pale, simple setae intermixed with scattered, weakly flattened, silvery setae. **STRUCTURE:** Hemelytra conspicuously elongate, corial margin nearly straight; eyes relatively small, not conspicuously protuberant (fig. 12); labium reaching to middle trochanters; claws straight over most of length, rather sharply curving apically; pulvilli large, extending three-fourth length of claw. **MALE GENITALIA:** Vesica in male very weakly twisted, apex acuminate, secondary gonopore subapical, lacking gonopore sclerite (fig. 16).

Female: Total length 2.66–2.83, length apex clypeus–cuneal fracture 1.90–2.01, width across pronotum 0.92–0.99; body form ovoid, compact (fig. 12).

ETYMOLOGY: Named for Michael D. Schwartz, who collected many of the known specimens, and who otherwise contributed greatly to the success of this project.

HOSTS: *Sarcobatus vermiculatus*, *S. baileyi*, *S. sp.*, *Atriplex canescens*, *A. sp.* (Chenopodiaceae).

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

DISCUSSION: The great majority of the many known specimens were taken on *Sar-*

cobatus, which would seem to suggest that it is preferred over *Atriplex* as a host.

PARATYPES: USA. — **Arizona:** *Coconino Co.:* 1 mi E of Tuba City on Rt. 163, 5000 ft, June 16, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 4♂, 5♀ (AMNH). **California:** *Inyo Co.:* 2 mi E of Big Pine, June 22, 1978, J. D. Pinto, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♂, 2♀ (UCR). *Modoc Co.:* ca. 4 mi E of Cedarville, 1440 m, July 2, 1979, R. T. Schuh and B. Massie, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♂, (AMNH). **Colorado:** *Mesa Co.:* DeBeque Canyon, July 4, 1980, J. T. and D. A. Polhemus, 2♂, 6♀ (JTP). *Mineral Co.:* Creede, June 21, 1990, J. T. and D. A. Polhemus, 1♂, 2♀ (JTP). *Montrose Co.:* 6 mi E of Montrose, August 13, 1987, T. J. Henry, *Atriplex canescens* (Chenopodiaceae), 6♀ (USNM). *Rio Blanco Co.:* W Evacuation Creek, 4 mi SE of state line on Rt. 45, 6400 ft, July 9, 1981, M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 26♂, 19♀ (AMNH). **Montana:** *Carbon Co.:* Bear Creek between Red Lodge and Belfry, 5000 ft, August 12, 1986, Schuh, Schwartz, Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 4♂, 6♀ (AMNH). **Nevada:** *Esmeralda Co.:* 13 mi W of Lida on Rt. 3, 1938 m, July 12, 1980, R. T. Schuh and G. M. Stonedahl, *Sarcobatus vermiculatus* (Chenopodiaceae), 20♂, 17♀ (AMNH). *Lander Co.:* 11 mi S of Rt. 50 on Rt. 376, T17N R44E, 5900 ft, June 28, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* var. *baileyi* (Chenopodiaceae), 2♂ (AMNH). Hickson Petroglyph at Hickson Summit on Rt. 50, 6500 ft, July 19, 1986, R. T. Schuh, 1♂ (AMNH). *Lincoln Co.:* Cathedral Gorge State Park, June 17, 1986, J. B. Knight and K. R. Helms, 1♂ (AMNH). *Nye Co.:* 2.5 mi NE of Gabbs off Rt. 844, Gabbs Rifle Range, 4800 ft, July 2, 1983, R. T. Schuh and M. D. Schwartz, 164♂ (AMNH, USNM). 30 mi S of Rt. 50 on Rt. 376, T13N R14E, 6000 ft, June 30, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 56♂, 48♀ (AMNH). 35 mi N of Tonapah, Coyote Hole Spring/Sevier Reservoir, T8 R42E S11 & 23, 6000 ft, June 30, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* var. *baileyi* (Chenopodiaceae), 40♂, 32♀

(AMNH). Northumberland Canyon Rd, Toquima Mts, T14N R44E Sec. 31, 6400 ft, June 28, 1983, R. T. Schuh and M. D. Schwartz, *Sarcobatus vermiculatus* var. *bailleyi* (Chenopodiaceae), 9♂, 16♀ (AMNH). *Washoe Co.*: Nixon, June 29, 1927, E. P. Van Duzee, 8♂, 3♀ (CAS). **New Mexico**: *Socorro Co.*: Socorro, May 2, 1981, D. A. and J. T. Polhemus, 1♂ (JTP). *Taos Co.*: Ojo Caliente, June 6, 1982, D. A. and J. T. Polhemus, *Atriplex* sp. (Chenopodiaceae), 16♂, 6♀ (JTP). **Oregon**: *Harney Co.*: T36S R35E S8, July 3, 1979–July 17, 1979, *Sarcobatus vermiculatus* (Chenopodiaceae), 10♂, 1♀ (OSU). **Utah**: *Box Elder Co.*: 5 mi N of Kelson, June 30, 1969, G. F. Knowlton and W. J. Hanson, (USU), 1♂, (USU). *San Juan Co.*: 25 mi N of Monticello on Rt. 191, 5700 ft, July 18, 1986, R. T. Schuh, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♀ (AMNH). Grand Flat near Collins Canyon, 5600 ft, June 1, 1982, D. A. and J. T. Polhemus, 1♂, 2♀ (JTP). *Uintah Co.*: 5–10 mi SE of Bonanza, T10S R24E Sec 17, 5000–5600 ft, July 5, 1982–July 8, 1982, M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 15♂, 15♀ (AMNH). **Wyoming**: *Sheridan Co.*: Arvada, July 21, 1927, H. H. Knight, *Sarcobatus vermiculatus* (Chenopodiaceae), 12♂, 14♀ (USNM).

Megalopsallus sparsus (Van Duzee)

Figures 12, 16

Europiella sparsa Van Duzee, 1918: 305 (n. sp.).
Megalopsallus sparsus: Schuh et al., 1995: 389 (n. comb.).
Europiella stitti Knight, 1968: 46 (n. sp.). NEW SYNONYMY.
Megalopsallus stitti: Schuh et al., 1995: 389 (n. comb.).
Europiella franseriae Knight, 1969: 85 (n. sp.); Henry, 1985: 1124 (n. syn.). REVISED SYNONYMY.
Megalopsallus franseriae: Schuh et al., 1995: 389 (n. comb.).

DIAGNOSIS: Recognized among small, at least partly greenish, *Megalopsallus* species by gray to black eyes and frequently dark head, anterior lobe of pronotum, and mesoscutum (fig. 12). Thoracic pleuron and venter and abdominal venter infuscate in male, pale in female. Most easily confused with *parapunctipes* and *punctipes* on basis of size, sex-

ual dimorphism, general coloration, and host associations. Male genitalia distinctive (fig. 16).

REDESCRIPTION: *Male:* Small to moderately small, total length 2.74–3.43, length apex clypeus–cuneal fracture 1.76–2.15, width across pronotum 0.90–1.04. **COLORATION:** Generally pale greenish or somewhat grayish (fig. 12); head (including face), anterior margin of pronotum, and mesoscutum often heavily infuscate; more rarely, nearly entire head, pronotum, and scutellum dark; hemelytra occasionally weakly to moderately infuscate; femora dark in darker specimens; eyes black; antennae always pale; underside of thorax and abdomen infuscate to very dark; tibial spines black with black bases. **SURFACE AND VESTITURE:** Dorsum smooth and weakly shining, clothed with pale to brown, recumbent, simple setae intermixed with silvery, weakly flattened setae. **STRUCTURE:** Hemelytra relatively short to moderately elongate (fig. 12); labium relatively short, just reaching middle trochanters; claws relatively short and broad, curving on apical one-third, pulvilli large, covering two-thirds of ventral claw surface. **MALE GENITALIA:** Vesica twisted, apex membranous; gonopore nearly apical, well sclerotized; gonopore sclerite developed (fig. 16).

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

HOSTS: *Atriplex canescens*, *A. confertifolia*, *A. hymenelytra*, *A. lentiformis*, *A. polycarpa*, *A. torreyi*, *A. sp.* (Chenopodiaceae). Probable sitting records: *Artemisia filifolia*, *Franseria deltoidea* (Asteraceae); *Sarcobatus vermiculatus* (Chenopodiaceae); *Sphaeralcea* sp. (Malvaceae); *Lycium* sp. (Solanaceae).

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

DISCUSSION: Henry (1985) synonymized *Europiella franseriae* Knight, 1969, with *Europiella stitti* Knight, 1968. The locality data and dates were identical for all specimens examined by Knight for these two nominal species, even though the labels were

not from the same printing. Knight (1969) recorded the host of *franseriae* as *Franseria deltoides*. Extensive collecting in Arizona and southern California has never yielded breeding records of *Megalopsallus* on *Franseria* (= *Ambrosia*, Asteraceae), although my colleagues and I collected extensively on it and documented several other mirids as breeding on it. Comparison of the types of *stitti* and *franseriae* with a very large amount of material of *sparsus*, indicates that those two nominal species fall within the range of variation of *sparsus*, a variable and widely distributed taxon, and I am therefore treating them as synonyms, *sparsus* having priority.

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

SPECIMENS EXAMINED: CANADA. — **Alberta:** Drumheller, August 11, 1957, A. R. and J. E. Brooks, *Atriplex* sp. (Chenopodiaceae), 5♂, 7♀ (CNC). **Saskatchewan:** Willocks, June 19, 1955, A. R. Brooks, *Atriplex* sp. (Chenopodiaceae), 8♂, 6♀ (CNC). **MEXICO.** — **Baja California Norte:** 7 mi N of El Rosario, June 11, 1979, J. D. Pinto, *Sphaeralcea* sp. (Malvaceae), 1♂ (UCR). 15 mi W of Bahia de los Angeles, March 26, 1979, J. D. Pinto, *Lycium* sp. (Solanaceae), 1♂ (UCR). 12 mi E of El Rosario, March 25, 1979, J. D. Pinto, *Atriplex* sp. (Chenopodiaceae), 3♂, 6♀ (UCR). El Crucero, April 4, 1976, J. Doyen, P. Rude, *Atriplex* sp. (Chenopodiaceae), 7♂, 2♀ (UCB). **Baja California Sur:** 47 km E of Rancho S. J. Castro, Viscaino Peninsula, March 25, 1980, J. D. Pinto, 2♂ (UCR). **USA.** — **Arizona:** *Cochise Co.:* 3 mi NW of Portal, Round Valley Rd, August 26, 1976, D. Chandler, 2♂ (UAZ). 5 mi W of Portal, 5400 ft, August 20, 1955, Gertsch and Ordway, 1♂ (AMNH). Portal, 1500 m, June 15, 1980, Schuh and Schmidt, *Atriplex* sp. (Chenopodiaceae), 5♀ (AMNH). Swisshelm Mts, September 20, 1978, J. D. Pinto, 1♂ (UCR). *Coconino Co.:* Rt. 64 just SE of Grand Canyon Natl. Park, June 26, 1980, K. & R. Schmidt, *Atriplex canescens* (Chenopodiaceae), 3♂, 7♀ (AMNH). Williams, 7000 ft, June 24, 1925, A. A. Nichol, 2♂, 1♀ (USNM). *Graham Co.:* 30 mi SE of Globe on Rt. 70, 3200 ft,

May 31, 1983, R. T. Schuh and G. M. Stonedahl, *Atriplex* sp. (Chenopodiaceae), 4♂, 12♀ (AMNH). *Maricopa Co.:* Woolsey Wash near Painted Rock Dam, 205 m, May 9, 1978–April 3, 1981, R. T. Schuh and A. F. Guenther, *Atriplex* sp. (Chenopodiaceae), 2♂, 18♀ (AMNH). Phoenix, Papago Park, January 18, 1983, J. T. Polhemus, *Atriplex* sp. (Chenopodiaceae), 2♂, 1♀ (JTP). Palo Verde Rd at Rt. 85 just S of Buckeye, 335 m, April 1, 1981, R. T. Schuh and M. D. Schwartz, *Atriplex* sp. (Chenopodiaceae), 55♂, 106♀ (AMNH). Mesa, 1200 ft, March 21, 1926, A. A. Nichol, 2♀ (USNM). Gila Bend, 260 m, March 4, 1941, L. L. Stitt, *Franseria deltoides* (Asteraceae), 2♂, 4♀ (USNM). Chandler, April 9, 1942, L. L. Stitt, 1♀ (USNM). Gila Bend, 260 m, February 13, 1941, L. L. Stitt, 3♀ (USNM). *Pima Co.:* Oxtaro, March 21, 1980, W. A. Jones, 1♂, 3♀ (USNM). Tucson, Houghton Rd at Tanque Verde Wash, Sta. Catalina Mts, 3400 ft, March 1, 1995, M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 14♂, 22♀ (AMNH). Organ Pipe Cactus Natl. Mon., Quitobaquito, April 3, 1966, C. W. O'Brien, 1♂ (UCB). Lukeville, February 18, 1970, P. Arnaud, 1♂ (CAS). 7 mi NW of Tucson, March 9, 1988, W. A. Jones, *Atriplex canescens* (Chenopodiaceae), 6♂, 4♀ (USNM). 10 mi S of Robles Jct., April 20, 1982, D. A. and J. T. Polhemus, *Atriplex* sp. (Chenopodiaceae), 7♂, 4♀ (JTP). Tucson (NE), Saddleback Road, 2400 ft, September 26, 1988, M. D. Schwartz, *Sarcobatus vermiculatus* (Chenopodiaceae), 1♂ (AMNH). *Yavapai Co.:* 2.3 mi N of Page Springs junction on Rt. 89A, 1700 m, June 21, 1980, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 2♂ (AMNH). 5 mi NW of Congress, 3800 ft, D.M. Wood, 6♂, 4♀ (CNC). **California:** *Fresno Co.:* Mendota, April 25, 1932, E. P. Van Duzee, 1♀ (CAS). *Imperial Co.:* Imperial near RR tracks on Rt. 580, 42 ft, April 23, 1980, M. D. Schwartz, *Atriplex* sp. (Chenopodiaceae), 18♂, 23♀ (AMNH). Potholes, April 7, 1923, E. P. Van Duzee, 9♂, 16♀ (CAS). Ft. Yuma, April 15, 1923, E.P. Van Duzee, 3♂, 2♀ (CAS). Coachella, May 13, 1917, E. P. Van Duzee, 7♀ (CAS). 15 mi NW of Westmoreland, February 12, 1977, J. D. Pinto, *Atriplex* sp. (Chenopodiaceae), 5♂, 9♀ (UCR). *Inyo Co.:* 2 mi E of Westgard Pass Summit, White

Mts, 2125 m, July 2, 1980, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 2♂, 6♀ (AMNH). Death Valley, 18 mi W of Beatty, Nevada, 2375 ft, March 18, 1971, P. Oman, 1♂, 2♀ (OSU). Death Valley, March 28, 1936, E. L. Paddock, *Atriplex hymenelytra* (Chenopodiaceae), 3♂, 2♀ (USNM). Death Valley, Saratoga Springs, February 1, 1955, E. G. Monroe, 4♂, 1♀ (CNC). Surprise Canyon, Panamint Mts, April 24, 1957, G. I. Stage, *Atriplex* sp. (Chenopodiaceae), 4♂, 3♀ (UCB). 13.5 mi W of Shoshone, March 19, 1971, P. Oman, 10♂, 11♀ (OSU). Kern Co.: Breckenridge Mts Rd 3 mi NE Comanche Rd, April 29, 1978, J. D. Pinto, 1♂ (UCR). McKittrick, April 9, 1966, C. W. O'Brien, 2♂ (UCB). Kings Co.: 8 mi SE of Avenal, April 16, 1966, C. W. O'Brien, 4♂, 1♀ (UCB). 11 mi S of Kettleman City, April 23, 1932, E. P. Van Duzee, 13♂, 2♀ (CAS). Los Angeles Co.: Palos Verdes, Sea Side, September 1, 1982, J. T. Polhemus, *Atriplex* sp. (Chenopodiaceae), 2♂, 2♀ (JTP). 22 mi S of Palmdale, 3000 ft, May 30, 1981, J. T. Polhemus, 2♂ (JTP). Monterey Co.: Gonzales, November 9, 1977, *Atriplex* sp. (Chenopodiaceae), 2♂ (CAFA). Riverside Co.: Indio, February 21, 1955, W.R.M. Mason, *Atriplex polycarpa* (Chenopodiaceae), 19♂, 43♀ (CNC). Palm Springs, December 22, 1941, R. H. Beamer, 1♂ (KU). Palm Springs, February 21, 1897, 5♂, 2♀ (USNM). Palm Springs, May 18, 1917–May 20, 1917, E. P. Van Duzee, Paratypes: 3♂ (CAS). Saboda Springs, June 2, 1917, E. P. Van Duzee, Paratype: 1♀ (CNC). Thermal, April 9, 1955, W. R. Richards, *Atriplex lentiformis* (Chenopodiaceae), 1♂, 3♀ (CNC). Thousand Palms, April 3, 1955, W. R. Richards, 2♂, 3♀ (CNC). San Bernardino Co.: 11 mi N of Needles, April 1, 1966, J. Schuh, 1♂ (AMNH). Rabbit Dry Lake, 2 mi W of Lucerne Valley, 935 m, May 13, 1978, R. T. Schuh and J. D. Pinto, *Atriplex* sp. (Chenopodiaceae), 3♂, 15♀ (AMNH). Rabbit Dry Lake, 2 mi W of Lucerne Valley, 935 m, May 13, 1978, J. D. Pinto, *Atriplex* sp. (Chenopodiaceae), 8♂, 14♀ (UCR). Providence Mts State Recreation Area, 4300 ft, May 18, 1982, M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 24♂, 11♀ (AMNH). 3 mi W of Lucerne Valley, May 5, 1975, J. D. Pinto, 1♂ (UCR). Baker, 920 ft, March 31, 1981, D. A. Polhemus, 5♂, 5♀ (JTP). San Diego Co.: 5 mi E of Ocotillo Wells, April 7, 1981, J. T. Polhemus, *Atriplex* sp. (Chenopodiaceae), 4♂, 1♀ (JTP). Anza-Borrego State Park, Bow Willow Campground, 300 m, March 29, 1981, R. T. Schuh and M. D. Schwartz, *Atriplex polycarpa* (Chenopodiaceae), 22♂, 36♀ (AMNH). Anza-Borrego State Park, Palm Canyon Trail, 600 ft, May 17, 1982, M. D. Schwartz, *Atriplex polycarpa* (Chenopodiaceae), 3♂, 18♀ (AMNH). N end of Borego-Clark Lake, March 23, 1978, Wasbauer et al., 4♂ (CAFA). San Joaquin Co.: May 25, 1917, W. M. Giffard, 1♂ (CAS). Santa Barbara Co.: 8 mi E of New Cuyama, 2000 ft, May 10, 1985, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 12♂, 20♀ (AMNH). Ventura Co.: Ventura, June 11, 1965, P. M. Jump, 1♂ (LACM). Colorado: Garfield Co.: 15.8 mi N of Loma on Rt. 139, June 19, 1982, M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 22♂, 9♀ (AMNH). Rifle, W. Rifle Creek, September 26, 1982, J. T. Polhemus, *Atriplex* sp. (Chenopodiaceae), 8♂, 3♀ (JTP). Jefferson Co.: Mouth of Deer Creek Canyon, 5000 ft, September 18, 1987, J. T. and D. A. Polhemus, 4♂ (JTP). Mesa Co.: 13 km NW of Gateway, 4700 ft, May 25, 1987, J. T. Polhemus, *Atriplex* sp. (Chenopodiaceae), 2♂, 1♀ (JTP). Gateway, 4600 ft, August 15, 1987, J. T. and D. A. Polhemus, 4♂, 8♀ (JTP). Pueblo Co.: Pueblo, September 15, 1898, 2♂ (USNM). Weld Co.: 7 mi NE of Nunn, August 15, 1968, P. Oman, *Atriplex canescens* (Chenopodiaceae), 5♂, 3♀ (OSU). Nevada: Clark Co.: 7 mi S of Boulder City, 530 m, May 17, 1978, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 8♂, 5♀ (AMNH). Esmeralda Co.: 13 mi W of Lida on Rt. 3, 1938 m, July 13, 1980, R. T. Schuh and G. M. Stonedahl, *Atriplex* sp. (Chenopodiaceae), 7♂, 9♀ (AMNH). Eureka Co.: 28 mi W of Eureka on Rt. 50, 6000 ft, June 27, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex* sp. (Chenopodiaceae), 5♂ (AMNH). Lander Co.: 11 mi S of Rt. 50 on Rt. 376, T17N R44E, 5800 ft, June 28, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex torreyi* (Chenopodiaceae), 30♂, 56♀ (AMNH). Lyon Co.: North Boundary of Toiyabe Natl. For. on Hwy 22, July 11, 1980, G. M. Stonedahl, *Atriplex* sp. (Chenopodi-

aceae), 1♂, 6♀ (AMNH). *Nye Co.*: 10 mi S of Tonapah, May 15, 1985, W. F. Chamberlain, 3♂, 1♀ (TAMU). 2.5 mi NE of Gabbs off Rt. 844, Gabbs Rifle Range, 4800 ft, July 2, 1983, R. T. Schuh and M. D. Schwartz, 1♂ (AMNH). Atomic Test Site, Orange Blossom Road 6.8 mi SE of Mercury Hwy, 4000 ft, June 8, 1983, Schuh, Schwartz, and Stonedahl, *Atriplex canescens* (Chenopodiaceae), 6♂, 5♀ (AMNH). Atomic Test Site, Rock V on Jackass Flats Rd, 3300 ft, June 6, 1983, Schuh, Schwartz, and Stonedahl, *Atriplex canescens* (Chenopodiaceae), 2♂ (AMNH). Mercury, June 12, 1965–June 24, 1965, Knight, Merino, Beck, *Atriplex canescens* (Chenopodiaceae), 46♂, 76♀ (USNM). *Washoe Co.*: Nixon, June 24, 1964, J. R. Miller, 1♂ (UCD). **New Mexico**: *Dona Ana Co.*: 9 mi W of Santa Teresa, May 8, 1999, 5♂, 8♀ (TAMU). Las Cruces, 1220 m, April 30, 1978, R. T. Schuh and J. R. Zimmerman, *Atriplex* sp. (Chenopodiaceae), 24♂, 35♀ (AMNH). 20 mi N of Las Cruces, 1280 m, April 30, 1978, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 2♂, 6♀ (AMNH). *Lea Co.*: Site 12, June 1, 1979, Schaffner et al., *Artemisia filifolia* (Asteraceae), 24♂, 18♀ (TAMU). *Lincoln Co.*: 5.6 mi NW of Carizozo, May 15, 1999, J. C. Schaffner, 20♂, 26♀ (TAMU). *Los Alamos Co.*: White Rock Overlook, July 3, 1982, J. T. Polhemus, 2♀ (JTP). *Santa Fe Co.*: Santa Fe, June 19, 1976, P. Oman, 1♂ (OSU). *Socorro Co.*: 5 mi W of Socorro, June 4, 1972, W. E. Clark, 1♂ (TAMU). Socorro, May 2, 1981, D. A. and J. T. Polhemus, 3♂ (JTP). *Valencia Co.*: Belen, R. H. Beamer, 1♂, 6♀ (KU). **Oregon**: *Harney Co.*: T37S R35E, April 25, 1979–July 15, 1979, Lightfoot and Cobb, *Atriplex canescens* (Chenopodiaceae), 8♂, 15♀ (OSU). **Texas**: *Brewster Co.*: 7 mi NE of Pinon, June 22, 1979, J. C. Schaffner et al., 4♂, 16♀ (TAMU). *Culberson Co.*: Van Horn, 1440 m, April 28, 1978, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 5♂, 7♀ (AMNH). 2 mi W of Kent on I-10, 1550 m, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 3♂, 2♀ (AMNH). 38 mi N of Van Horn, 1220 m, April 28, 1978, R. T. Schuh, *Atriplex* sp. (Chenopodiaceae), 16♂, 11♀ (AMNH). *Pecos Co.*: 27 mi S of Fort Stockton, April 18, 1985, J. C. Schaffner, 36♂, 41♀ (TAMU). 28 mi S of Fort Stockton, April 18, 1985, J. C. Schaffner, *Atriplex canescens* (Chenopodiaceae), 16♂, 26♀ (TAMU). *Terrell Co.*: 10 mi E of Sanderson, April 17, 1985, J. C. Schaffner, 1♀ (TAMU). *Upton Co.*: 1 mi S of Rankin, April 19, 1985, J. C. Schaffner, 11♂, 21♀ (TAMU). *Ward Co.*: 1 mi S of Grandfalls, April 19, 1965, J. C. Schaffner, 2♀ (TAMU). **Utah**: *Duchesne Co.*: 23.7 mi S of Myton, Well's Draw, T10S R15E, 6000 ft, M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 12♂, 11♀ (AMNH). *Emery Co.*: 2.5 mi W of Rt 24 on Goblin Valley Road, 5500 ft, June 19, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 5♂, 1♀ (AMNH). *Garfield Co.*: 14.3 mi S of Rt. 95 on Rt. 276, 5000 ft, June 19, 1983, R. T. Schuh and M. D. Schwartz, 16♂ (AMNH). *Grand Co.*: Green River, May 21, 1963, G. F. Knowlton, 1♂ (USU). 11 mi SE of jct. Rts 313 & 163 toward Dead Horse Point, 5200 ft, June 11, 1982, M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 6♂, 5♀ (AMNH). *San Juan Co.*: 3 mi SE of Rt. 263 on Clay Hills Crossing Rd, T39S R15E, 4700 ft, June 18, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 1♂, 2♀ (AMNH). 7.7 mi N of Mexican Hat on Rt. 261, 5000 ft, June 17, 1983, R. T. Schuh and M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 3♂, 3♀ (AMNH). Brush Basin Rim Rd, Co. rd. ♂ 227 0.5 E mp 116, 5700 ft, June 12, 1982, M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 3♂, 2♀ (AMNH). Canyonlands Natl. Park, Butler Flat, May 27, 1979, J. T. Polhemus, 1♀ (JTP). *Uintah Co.*: 5–10 mi SW of Bonanza, T10S R24E, 5000–5600 ft, June 4, 1981–September 6, 1982, M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 27♂, 21♀ (AMNH). *Washington Co.*: St. George (SW of city limits near Rt. 15), 2800 ft, May 24, 1981, M. D. Schwartz, *Atriplex torreyi* (Chenopodiaceae), 31♂, 36♀ (AMNH). St. George, 2800 ft, June 20, 1965, H. H. Knight, 1♀ (USNM). Santa Clara, November 3, 1929, D. E. Fox, *Atriplex canescens* (Chenopodiaceae), 1♂, 3♀ (USNM). Santa Clara on Rt. 56, T42S R16W, 2800 ft, May 23, 1981, M. D. Schwartz, *Atriplex canescens* (Chenopodiaceae), 20♂, 25♀ (AMNH).

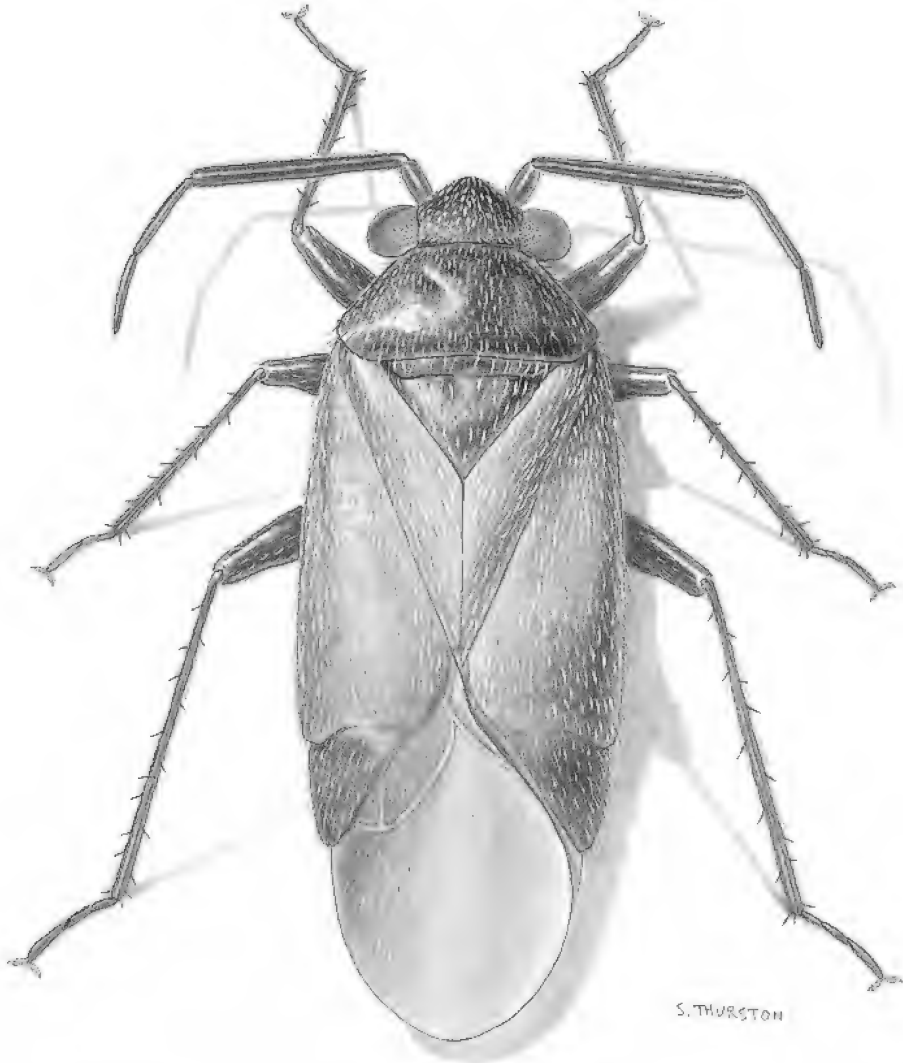


Fig. 22. Habitus of *Megalopsallus teretis*, male (Nevada, Nye Co., Atomic Test Site, Tweezer Road at Orange Blossom Road, ex *Lycium andersonii*).

***Megalopsallus teretis*, new species**

Figures 12, 16, 22, 23

HOLOTYPE: Male, Nevada: Nye Co., Nevada Atomic Test Site, Mercury Hwy at Angle Rd. (A3), elev. 3800 ft., June 8, 1983, Schuh, Schwartz, Stonedahl, *Lycium* sp. (Solanaceae). Deposited in the American Museum of Natural History.

DIAGNOSIS: Recognized by totally blackish brown coloration and spindle-shaped antennal segment 2 in female (figs. 12, 22, 23). Most easily confused with dark specimens of

humeralis and *nigrofemoratus*, but distinguished by having totally dark tibiae whereas tibiae in those species pale with dark spots at bases of spines.

DESCRIPTION: *Male:* Small to medium sized, total length 2.82–3.60, length apex clypeus–cuneal fracture 1.87–2.25, width across pronotum 0.96–1.06. **COLORATION:** Entire body and hemelytra blackish brown; eyes usually dark; appendages, especially antennae, dark, but reddish (fig. 12); tibial spines black. **SURFACE AND VESTI-**

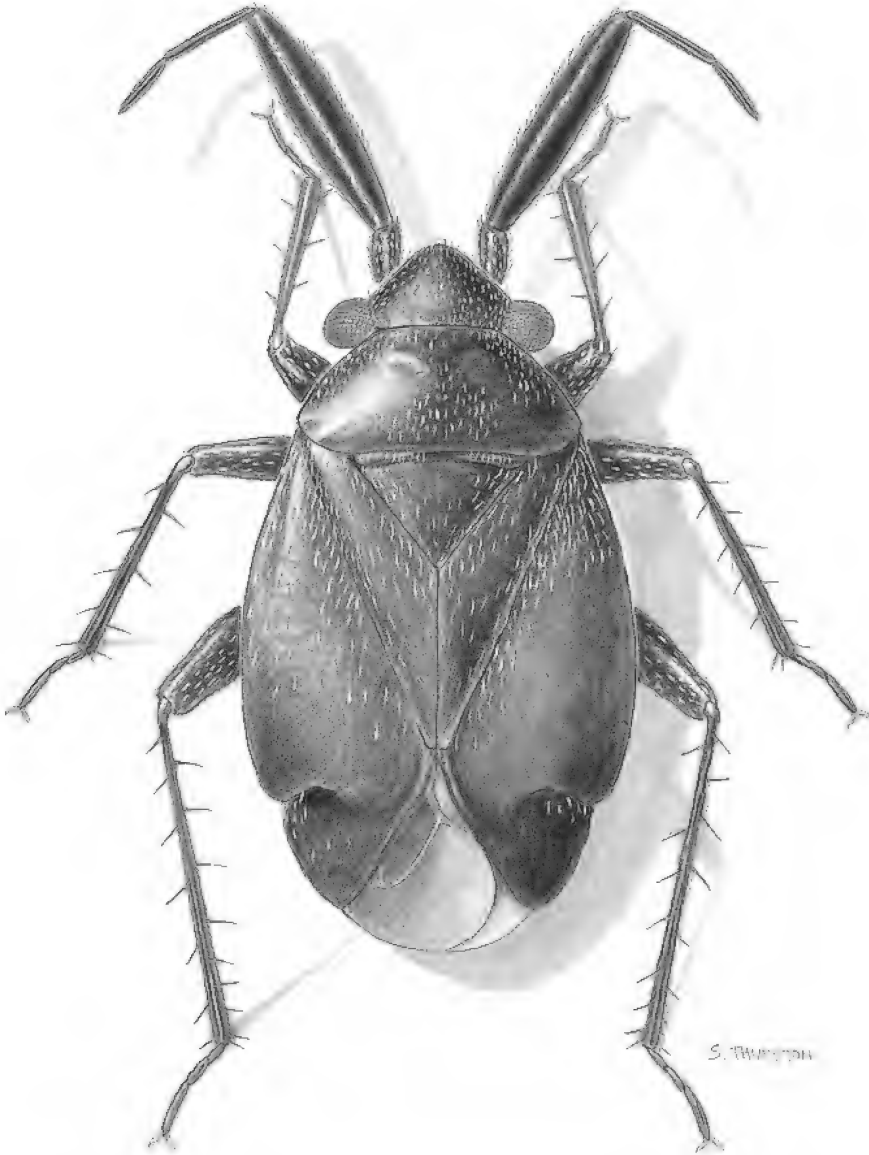


Fig. 23. Habitus of *Megalopsallus teretis*, female (Nevada, Nye Co., Atomic Test Site, Tweezer Road at Orange Blossom Road, ex *Lycium andersonii*).

TURE: Dorsum smooth, dull, clothed with recumbent, black, simple setae and white, appressed, woolly setae. STRUCTURE: Hemelytra moderately elongate, nearly parallel-sided; antennal segment 2 weakly inflated over most of length (figs. 12, 22); labium just reaching to middle trochanters; claws straight over most of length, curving near apex; pulvilli large, covering about two-thirds of

length of claw. MALE GENITALIA: Vesica relatively long, S-shaped, with a long, sclerotized, apical attenuation; gonopore well removed from apex of vesica, distinctly sclerotized; gonopore sclerite relatively short (fig. 16).

Female: Total length 2.28–2.64, length apex clypeus–cuneal fracture 1.73–1.97, width across pronotum 0.94–1.02; much

shorter than male, very broadly ovoid (fig. 12); antennal segment 2 usually much more strongly swollen than in male, spindle shaped (fig. 12).

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

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

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

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

PARATYPES: MEXICO. — **Zacatecas:** 6 mi S of Concepcion del Oro, July 9, 1983, Kovarik, Harrison, and Schaffner, 10♂, 15♀ (TAMU). 13 mi SE of Concepcion del Oro, July 9, 1983, Kovarik, Harrison, and Schaffner, 2♂, 7♀ (TAMU). USA. — **Arizona:** *Pima Co.:* Molino Basin, April 2, 1980, W. A. Jones, *Arctostaphylos patula* (Ericaceae), 1♀ (USNM). **Nevada:** *Nye Co.:* 0.5 mi N of Payute Mesa Road on Orangeblossom Road, 4100 ft, June 7, 1983, Schuh, Schwartz, and Stonedahl, 1♂, (AMNH). 2.5 mi NE of Gabbs off Rt. 844, 4800 ft, July 1, 1983, R. T. Schuh and M. D. Schwartz, *Lycium andersonii* (Solanaceae), 2♂, 7♀ (AMNH). Atomic Test Site, 2.6 mi W of Mercury Hwy, Cane Spgs. Rd, 3400 ft, June 6, 1983, Schuh, Schwartz, and Stonedahl, *Lycium andersonii* (Solanaceae), 2♂, 7♀ (AMNH). Atomic Test Site, Jackass Flats Road, 3300 ft, June 6, 1983, Schuh, Schwartz, and Stonedahl, *Lycium andersonii* (Solanaceae), 9♀ (AMNH). Atomic Test Site, Mercury Hwy at Angle Rd, 3800 ft, June 8, 1983, Schuh, Schwartz, and Stonedahl, *Lycium* sp. (Solanaceae), 3♂, 10♀ (AMNH). Atomic Test Site, Tweezer Rd at Orange Blossom Rd, 4750 ft, June 8, 1983, Schuh, Schwartz, and Stonedahl, *Lycium andersonii* (Solanaceae), 30♂, 38♀ (AMNH). **Utah:** *San Juan Co.:* 7.7 mi N of Mexican Hat on Rt. 261, 5000 ft, June 17, 1983, R. T. Schuh and G. M. Stonedahl, *Lycium andersonii* (Solanaceae), 2♂, 18♀ (AMNH).

NOTES ON OTHER SPECIES
PREVIOUSLY PLACED IN *MEGALOPSALLUS*

Europiella albipubescens Knight,
Incertae sedis

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

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

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

Europiella monticola Knight,
revised combination

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

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

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

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

TABLE I
Measurements of *Megalopsallus* spp.

Species		Length				Width		InterOcDi	AntSeg2
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head		
<i>atriplicis</i>									
M (N = 5)	Mean	3.51	2.33	0.39	0.26	0.99	0.81	0.38	0.97
	SD	0.19	0.12	0.04	0.03	0.04	0.03	0.02	0.05
	Range	0.52	0.28	0.1	0.07	0.09	0.07	0.04	0.12
	Min	3.25	2.2	0.33	0.21	0.95	0.77	0.35	0.91
	Max	3.77	2.48	0.43	0.29	1.04	0.84	0.4	1.03
F (N = 5)	Mean	3.07	2.22	0.4	0.26	1.03	0.83	0.44	0.85
	SD	0.11	0.08	0.04	0.03	0.03	0.02	0.02	0.06
	Range	0.22	0.19	0.12	0.08	0.09	0.07	0.04	0.14
	Min	2.97	2.14	0.33	0.21	0.99	0.8	0.42	0.8
	Max	3.19	2.33	0.45	0.29	1.08	0.87	0.46	0.94
<i>brendae</i>									
M (N = 5)	Mean	2.93	2.03	0.4	0.2	0.94	0.73	0.35	0.89
	SD	0.19	0.09	0.03	0.02	0.04	0.02	0.02	0.07
	Range	0.43	0.23	0.07	0.05	0.11	0.03	0.04	0.19
	Min	2.74	1.93	0.37	0.18	0.9	0.71	0.32	0.8
	Max	3.16	2.16	0.44	0.23	1.01	0.75	0.36	0.99
F (N = 5)	Mean	2.66	1.99	0.4	0.23	0.96	0.74	0.36	0.77
	SD	0.15	0.11	0.03	0.02	0.05	0.02	0.02	0.06
	Range	0.37	0.28	0.08	0.05	0.12	0.05	0.06	0.13
	Min	2.53	1.91	0.37	0.21	0.91	0.71	0.33	0.74
	Max	2.9	2.19	0.45	0.27	1.03	0.76	0.39	0.87
<i>brittoni</i>									
M (N = 5)	Mean	3.72	2.68	0.47	0.28	1.22	0.98	0.45	1.1
	SD	0.09	0.06	0.03	0.07	0.05	0.02	0.03	0.04
	Range	0.25	0.14	0.07	0.17	0.11	0.04	0.06	0.12
	Min	3.57	2.58	0.43	0.23	1.18	0.97	0.43	1.04
	Max	3.82	2.71	0.49	0.39	1.29	1.01	0.48	1.16
F (N = 5)	Mean	3.98	2.97	0.52	0.33	1.38	1.03	0.56	1.1
	SD	0.12	0.11	0.02	0.03	0.04	0.04	0.02	0.04
	Range	0.3	0.23	0.04	0.08	0.1	0.09	0.05	0.08
	Min	3.85	2.86	0.49	0.3	1.33	0.97	0.54	1.06
	Max	4.16	3.1	0.54	0.38	1.42	1.06	0.59	1.15
<i>californicus</i>									
M (N = 5)	Mean	2.93	1.97	0.31	0.15	0.98	0.78	0.38	0.81
	SD	0.13	0.1	0.05	0.02	0.04	0.02	0.01	0.01
	Range	0.33	0.24	0.14	0.06	0.09	0.06	0.03	0.01
	Min	2.78	1.88	0.23	0.14	0.94	0.75	0.37	0.81
	Max	3.1	2.12	0.37	0.2	1.03	0.82	0.4	0.82
F (N = 5)	Mean	2.82	2.09	0.34	0.18	1.07	0.82	0.44	0.79
	SD	0.09	0.11	0.06	0.03	0.05	0.02	0.01	0.03
	Range	0.18	0.27	0.12	0.09	0.12	0.04	0.03	0.07
	Min	2.72	1.98	0.29	0.14	1.01	0.8	0.43	0.76
	Max	2.9	2.26	0.41	0.23	1.13	0.84	0.45	0.83
<i>ephedrellus</i>									
M (N = 5)	Mean	3.09	2.13	0.42	0.19	1.03	0.87	0.37	0.91
	SD	0.05	0.03	0.01	0.01	0.02	0.01	0.01	0.04
	Range	0.11	0.07	0.03	0.03	0.04	0.02	0.02	0.08
	Min	2.97	2.05	0.38	0.17	0.98	0.85	0.36	0.85
	Max	3.25	2.24	0.45	0.23	1.07	0.89	0.4	1.06

TABLE 1—(Continued)

Species		Length				Width		InterOcDi	AntSeg2
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head		
<i>ephedrellus</i>									
F (N = 5)	Mean	2.71	1.99	0.42	0.21	0.99	0.86	0.4	0.76
	SD	0.06	0.04	0.03	0.03	0.03	0.01	0.01	0.03
	Range	0.14	0.1	0.07	0.06	0.06	0.03	0.04	0.07
	Min	2.64	1.94	0.38	0.18	0.96	0.85	0.38	0.73
	Max	2.78	2.04	0.45	0.24	1.01	0.88	0.42	0.8
<i>ephedrae</i>									
M (N = 5)	Mean	3.73	2.46	0.44	0.2	1.05	0.84	0.4	1.03
	SD	0.36	0.22	0.02	0.02	0.1	0.06	0.02	0.13
	Range	0.92	0.57	0.05	0.05	0.2	0.13	0.07	0.31
	Min	3.41	2.24	0.41	0.17	0.95	0.77	0.37	0.87
	Max	4.32	2.81	0.47	0.22	1.14	0.9	0.43	1.19
F (N = 5)	Mean	3.06	2.22	0.47	0.23	1.08	0.9	0.46	0.9
	SD	0.09	0.07	0.02	0.02	0.04	0.03	0.02	0.05
	Range	0.24	0.18	0.05	0.05	0.08	0.08	0.05	0.13
	Min	2.98	2.16	0.44	0.22	1.04	0.86	0.43	0.82
	Max	3.22	2.34	0.49	0.27	1.12	0.93	0.48	0.95
<i>femorialis</i>									
M (N = 5)	Mean	3.14	2.21	0.45	0.29	1.03	0.82	0.41	0.88
	SD	0.06	0.07	0.02	0.03	0.03	0.01	0.01	0.03
	Range	0.15	0.14	0.04	0.07	0.08	0.03	0.04	0.08
	Min	3.09	2.16	0.42	0.25	0.99	0.8	0.39	0.83
	Max	3.24	2.29	0.46	0.33	1.07	0.84	0.43	0.92
F (N = 5)	Mean	3.21	2.31	0.44	0.31	1.06	0.85	0.47	0.84
	SD	0.12	0.05	0.04	0.06	0.03	0.02	0.01	0.08
	Range	0.29	0.12	0.1	0.16	0.08	0.05	0.03	0.18
	Min	3.05	2.24	0.39	0.23	1.01	0.83	0.46	0.75
	Max	3.34	2.36	0.49	0.39	1.09	0.88	0.49	0.93
<i>flammeus</i>									
M (N = 5)	Mean	3.2	2.06	0.37	0.19	0.98	0.8	0.4	0.73
	SD	0.12	0.03	0.03	0.04	0.02	0.01	0.02	0.03
	Range	0.26	0.07	0.08	0.11	0.05	0.03	0.05	0.06
	Min	3.08	2.02	0.33	0.16	0.96	0.79	0.38	0.7
	Max	3.34	2.08	0.41	0.27	1.01	0.81	0.43	0.76
F (N = 5)	Mean	2.49	1.82	0.37	0.22	0.95	0.79	0.45	0.57
	SD	0.1	0.07	0.02	0.03	0.03	0.04	0.02	0.02
	Range	0.26	0.17	0.05	0.09	0.07	0.08	0.06	0.05
	Min	2.33	1.73	0.35	0.17	0.9	0.74	0.42	0.54
	Max	2.59	1.9	0.4	0.27	0.98	0.82	0.48	0.59
<i>froeschneri</i>									
M (N = 5)	Mean	3.25	2.26	0.5	0.19	1.06	0.9	0.41	0.92
	SD	0.11	0.06	0.04	0.02	0.03	0.02	0.02	0.02
	Range	0.28	0.15	0.09	0.04	0.07	0.04	0.06	0.05
	Min	3.09	2.16	0.46	0.17	1.02	0.89	0.38	0.91
	Max	3.37	2.31	0.55	0.21	1.08	0.93	0.44	0.96
F (N = 5)	Mean	3.09	2.21	0.5	0.25	1.07	0.93	0.45	0.9
	SD	0.1	0.11	0.02	0.03	0.02	0.01	0.01	0.04
	Range	0.22	0.25	0.04	0.08	0.04	0.02	0.02	0.1
	Min	2.98	2.1	0.47	0.21	1.05	0.92	0.44	0.85
	Max	3.2	2.35	0.51	0.29	1.09	0.94	0.47	0.95

TABLE 1—(Continued)

Species	Length				Width		InterOcDi	AntSeg2	
	Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head			
<i>humeralis</i>									
M-S (N = 2)	Mean	2.62	1.77	0.33	0.16	0.94	0.8	0.44	0.67
	SD	0.06	0.05	0	0.02	0	0.01	0.01	0
	Range	0.09	0.07	0	0.02	0	0.02	0.02	0
	Min	2.57	1.74	0.33	0.15	0.94	0.79	0.43	0.67
	Max	2.66	1.81	0.33	0.18	0.94	0.81	0.45	0.67
M-L (N = 6)	Mean	3.34	2.17	0.4	0.17	1.06	0.85	0.46	0.78
	SD	0.23	0.11	0.05	0.03	0.05	0.02	0.02	0.07
	Range	0.57	0.29	0.13	0.09	0.12	0.07	0.06	0.18
	Min	3.06	2.03	0.35	0.13	1	0.82	0.43	0.69
	Max	3.63	2.31	0.48	0.22	1.11	0.9	0.48	0.86
F (N = 8)	Mean	2.86	2.03	0.4	0.21	1.07	0.89	0.51	0.73
	SD	0.25	0.14	0.03	0.06	0.07	0.04	0.04	0.04
	Range	0.82	0.37	0.07	0.16	0.19	0.13	0.1	0.11
	Min	2.48	1.83	0.36	0.13	0.97	0.82	0.47	0.69
	Max	3.3	2.19	0.44	0.29	1.16	0.95	0.57	0.8
<i>knowltoni</i>									
M (N = 5)	Mean	4.94	3.13	0.49	0.26	1.24	0.94	0.51	1.41
	SD	0.13	0.1	0.02	0.02	0.03	0.01	0.01	0.05
	Min	4.51	2.79	0.41	0.23	1.15	0.93	0.48	1.27
	Max	5.2	3.31	0.53	0.32	1.32	0.97	0.52	1.55
F (N = 5)	Mean	3.83	2.86	0.52	0.31	1.29	1.04	0.61	1.16
	SD	0.14	0.09	0.02	0.03	0.03	0.03	0.03	0.08
	Range	0.36	0.2	0.06	0.07	0.07	0.06	0.06	0.21
	Min	3.62	2.75	0.5	0.28	1.25	1	0.57	1.07
	Max	3.98	2.96	0.55	0.35	1.32	1.06	0.63	1.28
<i>marmoratus</i>									
M (N = 6)	Mean	3.13	2.12	0.38	0.19	0.99	0.81	0.37	0.88
	SD	0.1	0.08	0.03	0.05	0.04	0.01	0.01	0.05
	Range	0.26	0.2	0.08	0.13	0.09	0.02	0.03	0.15
	Min	3	1.99	0.33	0.13	0.94	0.8	0.35	0.81
	Max	3.26	2.2	0.41	0.26	1.04	0.82	0.38	0.96
F (N = 5)	Mean	2.84	2.07	0.41	0.25	1.06	0.84	0.44	0.74
	SD	0.17	0.14	0.02	0.04	0.07	0.04	0.02	0.04
	Range	0.44	0.32	0.04	0.08	0.17	0.08	0.05	0.11
	Min	2.57	1.84	0.38	0.2	0.96	0.79	0.42	0.68
	Max	3.01	2.16	0.42	0.29	1.13	0.87	0.47	0.79
<i>nicholi</i>									
M(N = 5)	Mean	3.24	2.12	0.4	0.16	1.02	0.8	0.43	0.76
	SD	0.17	0.11	0.04	0.03	0.03	0.04	0.02	0.05
	Range	0.46	0.3	0.09	0.07	0.09	0.1	0.05	0.14
	Min	3.02	1.95	0.37	0.13	0.98	0.74	0.4	0.68
	Max	3.48	2.24	0.46	0.2	1.06	0.84	0.45	0.82
F (N = 5)	Mean	2.47	1.88	0.39	0.24	0.95	0.83	0.48	0.68
	SD	0.09	0.07	0.02	0.05	0.05	0.03	0.02	0.05
	Range	0.22	0.16	0.05	0.11	0.14	0.07	0.05	0.11
	Min	2.37	1.79	0.37	0.18	0.88	0.8	0.46	0.63
	Max	2.59	1.95	0.42	0.29	1.02	0.86	0.51	0.74
<i>nigricaput</i>									
M (N = 5)	Mean	3.4	2.28	0.43	0.19	1.05	0.77	0.37	1.12
	SD	0.04	0.04	0.02	0.04	0.03	0.01	0.01	0.03
	Range	0.09	0.1	0.05	0.11	0.07	0.02	0.02	0.08
	Min	3.35	2.23	0.4	0.15	1.02	0.76	0.37	1.09
	Max	3.44	2.33	0.45	0.27	1.1	0.78	0.39	1.17

TABLE 1—(Continued)

Species		Length				Width		InterOcDi	AntSeg2
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head		
<i>nigricaput</i>									
F (N = 5)	Mean	3.19	2.28	0.46	0.25	1.04	0.79	0.41	0.89
	SD	0.05	0.07	0.01	0.03	0.01	0.01	0.02	0.07
	Range	0.13	0.17	0.03	0.08	0.02	0.03	0.04	0.19
	Min	3.11	2.19	0.44	0.2	1.04	0.77	0.4	0.78
	Max	3.24	2.36	0.47	0.28	1.06	0.8	0.44	0.97
<i>nigrofemoratus</i>									
M (N = 8)	Mean	3.4	2.18	0.4	0.17	1.05	0.85	0.45	0.85
	SD	0.26	0.16	0.03	0.02	0.07	0.03	0.02	0.05
	Range	0.75	0.46	0.08	0.05	0.19	0.07	0.07	0.14
	Min	3.13	2	0.37	0.16	0.97	0.81	0.41	0.76
	Max	3.88	2.46	0.45	0.21	1.16	0.88	0.48	0.91
F (N = 8)	Mean	2.65	1.91	0.39	0.21	0.99	0.83	0.49	0.66
	SD	0.18	0.13	0.03	0.04	0.05	0.04	0.03	0.08
	Range	0.52	0.43	0.06	0.13	0.16	0.12	0.11	0.24
	Min	2.33	1.65	0.35	0.14	0.9	0.76	0.43	0.54
	Max	2.85	2.08	0.42	0.27	1.06	0.89	0.54	0.78
<i>nuperus</i>									
M (N = 5)	Mean	3.26	2.41	0.45	0.31	1.08	0.89	0.43	1.09
	SD	0.17	0.12	0.04	0.06	0.04	0.03	0.02	0.06
	Range	0.35	0.28	0.09	0.15	0.11	0.09	0.06	0.17
	Min	3.1	2.27	0.39	0.25	1.02	0.86	0.39	1.01
	Max	3.45	2.56	0.48	0.4	1.13	0.94	0.46	1.17
F (N = 5)	Mean	3.4	2.54	0.46	0.34	1.16	0.92	0.49	1
	SD	0.22	0.22	0.03	0.03	0.11	0.07	0.05	0.14
	Range	0.55	0.52	0.06	0.09	0.28	0.19	0.12	0.34
	Min	3.22	2.4	0.44	0.3	1.05	0.85	0.45	0.81
	Max	3.77	2.92	0.5	0.39	1.33	1.04	0.57	1.16
<i>pallidus</i>									
M (N = 6)	Mean	4.23	2.75	0.47	0.27	1.15	0.83	0.4	1.14
	SD	0.12	0.08	0.04	0.02	0.04	0.02	0.02	0.08
	Range	0.33	0.22	0.12	0.05	0.1	0.04	0.05	0.2
	Min	4.01	2.61	0.39	0.24	1.09	0.81	0.38	1.04
	Max	4.34	2.83	0.51	0.3	1.19	0.86	0.43	1.24
F (N = 5)	Mean	3.61	2.56	0.49	0.28	1.21	0.88	0.48	0.97
	SD	0.21	0.13	0.03	0.05	0.08	0.03	0.02	0.07
	Range	0.52	0.35	0.08	0.12	0.19	0.08	0.05	0.17
	Min	3.24	2.34	0.45	0.22	1.08	0.83	0.44	0.86
	Max	3.76	2.68	0.53	0.34	1.28	0.91	0.49	1.03
<i>pallipes</i>									
M (N = 5)	Mean	3.81	2.48	0.45	0.19	1.03	0.84	0.36	0.96
	SD	0.23	0.1	0.01	0.03	0.07	0.03	0.02	0.03
	Range	0.64	0.27	0.04	0.08	0.18	0.07	0.05	0.08
	Min	3.49	2.36	0.43	0.15	0.96	0.81	0.34	0.94
	Max	4.13	2.62	0.47	0.23	1.14	0.88	0.4	1.02
F (N = 5)	Mean	3.31	2.27	0.42	0.21	1.02	0.81	0.37	0.9
	SD	0.11	0.07	0.04	0.05	0.02	0.02	0.02	0.04
	Range	0.29	0.17	0.11	0.13	0.04	0.05	0.04	0.1
	Min	3.18	2.21	0.37	0.14	1	0.79	0.35	0.86
	Max	3.48	2.38	0.48	0.27	1.04	0.84	0.39	0.96

TABLE 1—(Continued)

Species		Length				Width		InterOcDi	AntSeg2
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head		
<i>parapunctipes</i>									
M (N = 5)	Mean	3.5	2.27	0.39	0.17	0.95	0.7	0.37	0.84
	SD	0.17	0.11	0.04	0.02	0.03	0.03	0.02	0.03
	Range	0.44	0.31	0.08	0.06	0.09	0.08	0.05	0.07
	Min	3.28	2.12	0.34	0.14	0.91	0.65	0.34	0.81
	Max	3.72	2.42	0.42	0.19	1	0.73	0.4	0.88
F (N = 5)	Mean	2.52	1.85	0.37	0.2	0.94	0.74	0.41	0.65
	SD	0.13	0.13	0.02	0.02	0.06	0.05	0.02	0.07
	Min	2.43	1.78	0.36	0.16	0.87	0.71	0.38	0.55
	Max	2.75	2.08	0.41	0.22	1.03	0.83	0.44	0.74
	<i>pictipes</i>								
M (N = 5)	Mean	2.7	1.81	0.35	0.15	0.84	0.67	0.33	0.72
	SD	0.18	0.14	0.04	0.05	0.02	0	0	0.03
	Range	0.45	0.35	0.1	0.13	0.04	0.01	0.01	0.08
	Min	2.48	1.69	0.28	0.07	0.83	0.67	0.33	0.68
	Max	2.93	2.03	0.38	0.2	0.87	0.68	0.34	0.76
F (M = 5)	Mean	2.57	1.82	0.36	0.19	0.94	0.71	0.38	0.66
	SD	0.06	0.06	0.03	0.04	0.02	0.01	0.03	0.03
	Range	0.12	0.15	0.07	0.08	0.05	0.04	0.06	0.09
	Min	2.5	1.75	0.33	0.15	0.91	0.68	0.34	0.62
	Max	2.63	1.89	0.4	0.24	0.96	0.72	0.4	0.71
<i>punctatus</i>									
M (N = 6)	Mean	3.99	2.59	0.45	0.18	1.21	0.83	0.39	0.93
	SD	0.13	0.08	0.03	0.03	0.04	0.03	0.02	0.02
	Range	0.37	0.23	0.08	0.07	0.11	0.07	0.06	0.05
	Min	3.78	2.47	0.41	0.15	1.16	0.79	0.34	0.91
	Max	4.15	2.7	0.49	0.21	1.27	0.86	0.4	0.96
F (N = 5)	Mean	3.2	2.33	0.45	0.19	1.25	0.88	0.48	0.8
	SD	0.06	0.04	0.03	0.02	0.04	0.01	0.01	0.05
	Range	0.13	0.12	0.08	0.05	0.09	0.04	0.02	0.15
	Min	3.16	2.27	0.42	0.18	1.19	0.86	0.47	0.74
	Max	3.29	2.4	0.5	0.22	1.28	0.9	0.49	0.89
<i>punctipes</i>									
M (N = 5)	Mean	3.34	2.26	0.38	0.17	0.96	0.73	0.37	0.8
	SD	0.51	0.53	0.04	0.05	0.03	0	0.01	0.08
	Range	1.2	1.23	0.1	0.13	0.07	0.01	0.04	0.2
	Min	2.91	1.93	0.31	0.11	0.92	0.73	0.35	0.74
	Max	4.12	3.16	0.41	0.24	0.99	0.74	0.39	0.94
F (N = 5)	Mean	2.67	1.89	0.38	0.18	0.98	0.78	0.44	0.67
	SD	0.1	0.09	0.04	0.01	0.06	0.05	0.03	0.04
	Range	0.27	0.2	0.1	0.02	0.15	0.12	0.09	0.07
	Min	2.52	1.78	0.34	0.17	0.91	0.7	0.4	0.63
	Max	2.79	1.98	0.44	0.19	1.06	0.82	0.48	0.7
<i>rubricornis</i>									
M (N = 5)	Mean	3.09	2.04	0.4	0.21	0.97	0.82	0.47	0.72
	SD	0.37	0.16	0.02	0.03	0.05	0.04	0.01	0.06
	Range	0.81	0.39	0.06	0.06	0.13	0.09	0.02	0.13
	Min	2.75	1.88	0.37	0.17	0.92	0.76	0.46	0.66
	Max	3.56	2.27	0.43	0.24	1.05	0.86	0.48	0.79
F (N = 5)	Mean	2.59	1.92	0.35	0.26	0.96	0.85	0.52	0.66
	SD	0.22	0.12	0.08	0.06	0.07	0.04	0.03	0.05
	Range	0.53	0.27	0.21	0.14	0.17	0.09	0.08	0.12
	Min	2.33	1.78	0.22	0.21	0.89	0.82	0.48	0.59
	Max	2.86	2.05	0.42	0.35	1.06	0.91	0.56	0.71

TABLE 1—(Continued)

Species		Length				Width		InterOcDi	AntSeg2
		Total Body	Cun-Clyp	Pronotum	Head	Pronotum	Head		
<i>rubropictipes</i>									
M (N = 5)	Mean	3.52	2.41	0.43	0.23	1.08	0.87	0.39	0.96
	SD	0.1	0.06	0.04	0.06	0.04	0.02	0.01	0.04
	Range	0.26	0.17	0.11	0.15	0.09	0.05	0.03	0.09
	Min	3.36	2.31	0.4	0.16	1.03	0.85	0.38	0.93
	Max	3.62	2.47	0.5	0.31	1.11	0.9	0.41	1.02
F (N = 4)	Mean	2.92	2.27	0.41	0.27	1.08	0.86	0.45	0.83
	SD	0.42	0.13	0.02	0.03	0.08	0.01	0.01	0.07
	Range	0.91	0.31	0.05	0.08	0.18	0.03	0.02	0.14
	Min	2.5	2.14	0.38	0.24	0.98	0.84	0.44	0.79
	Max	3.41	2.45	0.43	0.32	1.16	0.87	0.46	0.93
<i>sarcobati</i>									
M (N = 5)	Mean	3.13	2.15	0.43	0.2	1.05	0.86	0.47	0.84
	SD	0.09	0.07	0.01	0.03	0.03	0.01	0.02	0.06
	Range	0.21	0.17	0.03	0.07	0.06	0.03	0.06	0.16
	Min	3.04	2.05	0.41	0.17	1.01	0.84	0.44	0.77
	Max	3.26	2.22	0.44	0.25	1.08	0.87	0.5	0.93
F (N = 5)	Mean	3.09	2.25	0.45	0.28	1.13	0.92	0.53	0.62
	SD	0.17	0.13	0.05	0.05	0.05	0.03	0.02	0.35
	Range	0.42	0.32	0.11	0.11	0.14	0.08	0.05	0.82
	Min	2.92	2.13	0.39	0.21	1.07	0.88	0.5	0
	Max	3.34	2.45	0.5	0.32	1.21	0.96	0.54	0.82
<i>schwartzi</i>									
M (N = 5)	Mean	3.57	2.31	0.39	0.2	1.01	0.73	0.36	0.99
	SD	0.11	0.05	0.02	0.02	0.03	0.01	0.01	0.04
	Range	0.24	0.11	0.04	0.07	0.07	0.03	0.03	0.08
	Min	3.46	2.26	0.37	0.16	0.96	0.72	0.35	0.95
	Max	3.7	2.37	0.41	0.23	1.03	0.75	0.38	1.03
F (N = 5)	Mean	2.75	1.92	0.37	0.21	0.95	0.72	0.4	0.75
	SD	0.07	0.05	0.01	0.02	0.03	0.01	0.02	0.02
	Range	0.17	0.11	0.03	0.05	0.07	0.03	0.04	0.05
	Min	2.66	1.9	0.36	0.19	0.92	0.71	0.38	0.72
	Max	2.83	2.01	0.39	0.24	0.99	0.74	0.42	0.76
<i>sparsus</i>									
M (N = 8)	Mean	3.02	1.95	0.37	0.16	0.96	0.77	0.41	0.75
	SD	0.25	0.16	0.03	0.03	0.05	0.03	0.02	0.07
	Range	0.69	0.39	0.08	0.09	0.14	0.11	0.07	0.21
	Min	2.74	1.76	0.34	0.11	0.9	0.71	0.38	0.64
	Max	3.43	2.15	0.42	0.2	1.04	0.81	0.45	0.84
F (N = 8)	Mean	2.48	1.78	0.36	0.18	0.94	0.78	0.45	0.67
	SD	0.17	0.12	0.04	0.03	0.04	0.04	0.02	0.12
	Range	0.41	0.36	0.11	0.1	0.1	0.12	0.07	0.36
	Min	2.3	1.67	0.31	0.13	0.89	0.72	0.42	0.57
	Max	2.71	2.03	0.42	0.23	0.99	0.84	0.49	0.93
<i>teretis</i>									
M (N = 5)	Mean	3.28	2.08	0.38	0.18	1.02	0.75	0.4	0.81
	SD	0.31	0.15	0.09	0.05	0.04	0.02	0.01	0.09
	Range	0.78	0.39	0.21	0.13	0.1	0.06	0.02	0.24
	Min	2.82	1.87	0.3	0.14	0.96	0.72	0.39	0.66
	Max	3.6	2.25	0.51	0.27	1.06	0.79	0.41	0.9
F (N = 5)	Mean	2.42	1.85	0.37	0.26	0.98	0.79	0.46	0.82
	SD	0.15	0.09	0.03	0.07	0.03	0.02	0.02	0.07
	Range	0.36	0.24	0.07	0.16	0.07	0.06	0.05	0.18
	Min	2.28	1.73	0.33	0.21	0.94	0.76	0.43	0.7
	Max	2.64	1.97	0.41	0.37	1.02	0.82	0.48	0.88

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