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A Review of the Late Season Stenodemini of Southwest North America, and a Description of the New Genus *Caracoris* from Brazil (Heteroptera: Miridae)

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ABSTRACT

The new genus *Autumnimiris* is diagnosed and described to include the new species, *guadalupe*, and four other species, creating these new combinations: *albescens* (Van Duzee) [*Porpomiris*], *koebelei* (Van Duzee) [*Megaloceroea*], *roseus* (Distant) [*Neotropicomiris*], and *rubicundus* (Uhler) [*Litomiris*]. These new species synonymies are created (senior names first): *Megaloceroea koebelei* Van Duzee = *M. letcheri* Knight, *Miris roseus* Distant = *Megaloceroea punctata* Knight. Lectotypes are designated for *Litomiris tritavus* Bliven, *Megaloceroea debilis* Uhler, *M. rubicundus* Uhler, and *Stenodema gracilis* Van Duzee. The new genus *Caracoris* is diagnosed and described for a new species, *nigropunctatus*, from Pará, Brazil. The genera *Chaetofoveolocoris* Knight and *Litomiris* Slater are reviewed, and a new species, *C. parsoni*, from Chihuahua, Mexico, is described. Each species treatment is provided with a diagnosis, description or redescription, figures of the male dorsal habitus and genitalia, and distribution map. A key to species is presented for *Autumnimiris* and *Litomiris*.

INTRODUCTION

This paper is a review of four stenodemine genera placed in the *Stenodema* generic group established by the cladistic analysis of Schwartz (1987). Members of the *Stenodema* group are distinguished by these features of the genitalia: vesica of male with aperture of secondary gonopore incomplete dorsally, and without basal processes; posterior wall of female with saclike dorsal structure and large inter-ramal lobes. Documentation is provided for the new genus *Autumnimiris* with five southwest North American species, four of

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which were previously placed in other genera, and for the new genus, *Caracoris*, described for a new species from Brazil. In addition, the two closely related and sympatric genera, *Chaetofoveolocoris* and *Litomiris*, are reviewed, and a new species of *Chaetofoveolocoris* is described. All taxa are arranged alphabetically by genus and species, and each is provided with a diagnosis, complete description, figures of the male dorsal habitus and genitalia, and distributional information. A key to species is presented for *Autumnimiris* and *Litomiris*. The genitalic terminology follows Kelton (1959) and Davis (1955) as modified by Schwartz (1987). All measurements are in millimeters.

Acknowledgments

I thank the following individuals and their respective institutions for providing material in their care. The abbreviations listed are used in the Material Examined sections:

AMNH	R. T. Schuh and G. M. Stonedahl, American Museum of Natural History, New York
BYU	S. L. Wood, Monte L. Bean Museum, Brigham Young University, Provo, Utah
CAFA	A. R. Hardy, California Department of Food and Agriculture, Sacramento
CAS	P. H. Arnaud, Jr., California Academy of Sciences, San Francisco
CNC	R. Foottit and L. A. Kelton, Agriculture Canada, Biosystematics Research Institute, Ottawa
CU	J. K. Liebherr, Department of Entomology, Cornell University, Ithaca, New York
KU	P. D. Ashlock and A. Slater, Snow Entomological Collection, University of Kansas, Lawrence
LACM	C. L. Hogue, Los Angeles County Museum of Natural History, California
LSU	J. Chapin and D. A. Rider, Entomology Museum, Louisiana State University, Baton Rouge
OSDA	K. Goeden, Oregon State Department of Agriculture, Salem
OSU	J. D. Lattin and P. W. Oman, Systematic Entomology Laboratory, Oregon State University, Corvallis
TAM	J. C. Schaffner, Department of Entomology, Texas A&M University, College Station
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UCB	J. Chemsak and J. A. Powell, Department of Entomology, University of California, Berkeley
UCD	R. O. Schuster, Department of Entomology, University of California, Davis
UCR	J. D. Pinto and S. I. Frommer, Department of Entomology, University of California, Riverside
UMNZ	B. M. OConner, Museum of Zoology, University of Michigan, Ann Arbor
UNAM	H. Brailovsky, Instituto de Biologia, Universidad Nacional Autonoma, Mexico, D. F.
USNM	T. J. Henry, United States National Museum of Natural History, Washington, D.C.
USU	W. J. Hanson, Department of Biology, Utah State University, Logan
ZMH	A. Jansson, University Zoological Museum, Helsinki, Finland

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SYSTEMATICS

AUTUMNIMIRIS, NEW GENUS

Type Species: *Megaloceroea koebelei* Van Duzee.

Diagnosis: Distinguished from other genera of the *Stenodema* group by the shining, deep punctures of the dorsal surface; the labium usually reaching the metacoxae; the eyes slightly removed from the pronotum; and these features of the genitalia: *Male*. vesica with one simple lobal sclerite (figs. 2d, 5d, 7d), sometimes with associated adjacent spinulae (figs. 4d, 9d); distal portion of right

paramere slightly expanded (figs. 2c, 4c, 5c, 7c, 9c); shaft of left paramere stout and with one subapical point (figs. 2b, 4b, 5b, 7b, 9b). *Female*. small to medium, ovoid sclerotized rings; dorsal labiate plate forming a ring at the base of the genital chamber (fig. 7f).

DESCRIPTION: **Dorsal Aspect:** Total length 5.50–8.40; general coloration testaceous to rufus; usually variously marked with fuscous to piceous bilateral vitta on head, pronotum, scutellum, hemelytra, and cuneus, sometimes with rufus to piceous markings on antennae, scutellum medially, knees of legs, and venter bilaterally; surface smooth with deep punctures; frons and vertex with sparsely distributed punctures; collar and calli deeply punctate, sometimes punctures faint and sparsely distributed; mesoscutum smooth; scutellum, clavus, corium, and embolium with variously distributed punctures. **Vestiture:** With moderately distributed, short, recumbent, pale simple setae, and sometimes with moderate to long, erect, simple setae. **Head:** Triangular or subquadrate in dorsal view, subrectangular or rectangular in lateral view; slightly separated from pronotum; vertex ecarinate and slightly rounded; dorsal surface smoothly curved from vertex to apex of frons; apex of frons rounded and produced slightly anterodorsad of base of tylus; anterodorsal portion of tylus rounded and produced; labium reaching metacoxae, sometimes just reaching distal end of mesosternum, segment I reaching xyphus. **Antennae:** Segment I of uniform thickness throughout, not bowed. **Pronotum:** Subtriangular with proepisternum rounded and produced, visible in dorsal view, with distinct anterior and posterior lobes, posterior lobe rounded and produced dorsad of anterior lobe; calli weakly differentiated, confluent anteromedially, not reaching lateral margins of pronotum; lateral margin mostly rounded, margin carinate and bridged dorsad of coxal cleft. **Mesoscutum and Scutellum:** Confluent medially; mesoscutum broadly exposed. **Hemelytra:** Macropterous. **Legs:** Metafemora usually longer than or sometimes subequal to abdomen. **Male Genitalia:** *Genital capsule:* Without tubercles dorsad of paramere insertions; posteroventral portion of capsule not produced. *Left paramere:* Sensory lobe not differentiated above curvature of arm; surface smooth; shaft stout; apex abruptly narrowed, rounded, with one subapical point. *Right paramere:* Distal portion slightly expanded, with small, pointed, ventrally directed apex. *Vesica:* Aperture of secondary gonopore incomplete dorsally, and with collapsed appearance; single, large lobal sclerite, sometimes continuous with small spinulae basally; small, internal U-shaped sclerite adjacent and behind secondary gonopore; membrane with small sclerite to left of gonopore. **Female Genitalia:** *Sclerotized rings:* Figure 7f. Open, rectangular, of small or moderate size. Dorsal labiate plate: Narrowly developed laterally, adhering ramae, obsolete caudally, with posteriormost edge narrowly spanning and forming at the base of the genital chamber. Ventral labiate plate: Present behind lateral one-half of rings. *Posterior wall:* Inter-ramal sclerite: Moderately deep with straight ventral margin. Median process: Well sclerotized, extending dorsad and ventrad of sclerite, extending anteriad into dorsal structure, with plowlike plate posteriorly. Dorsal structure: Small, pointed, surrounding anterior projection of median process, saclike. Inter-ramal lobes: Large, obscuring sclerite; membranous extension surrounding periphery of dorsal structure.

ETYMOLOGY: From the Latin *autumn* and *miris*, referring to the autumn occurrence of members of the genus on cool season grasses in the desert southwest of North America; masculine.

DISCUSSION: This genus is proposed to contain four species previously placed in *Litomiris* Slater, *Megaloceroea* Fieber, *Neotropicomiris* Carvalho and Fontes, and *Porpomiris* Berg, and the new species, *guadalupe*. All species possess vesicae with one furrowed lobal sclerite (with prominently notched or minutely spinose margins) located on the dorsalmost portion of the fully inflated membrane; small or medium size sclerotized rings; a dorsal labiate plate narrowly adhering to the ramae laterally and narrowly spanning the genital chamber distally and forming a ring. These features of the genitalia distinguish *Autumnimiris* from related genera as follows: *Litomiris* has two lobal sclerites, large sclerotized rings, and a dorsal labiate plate not adhering to the ramae distally and not forming a ring; *Neotropicomiris* does not have lobal sclerites, and possesses a bluntly pro-

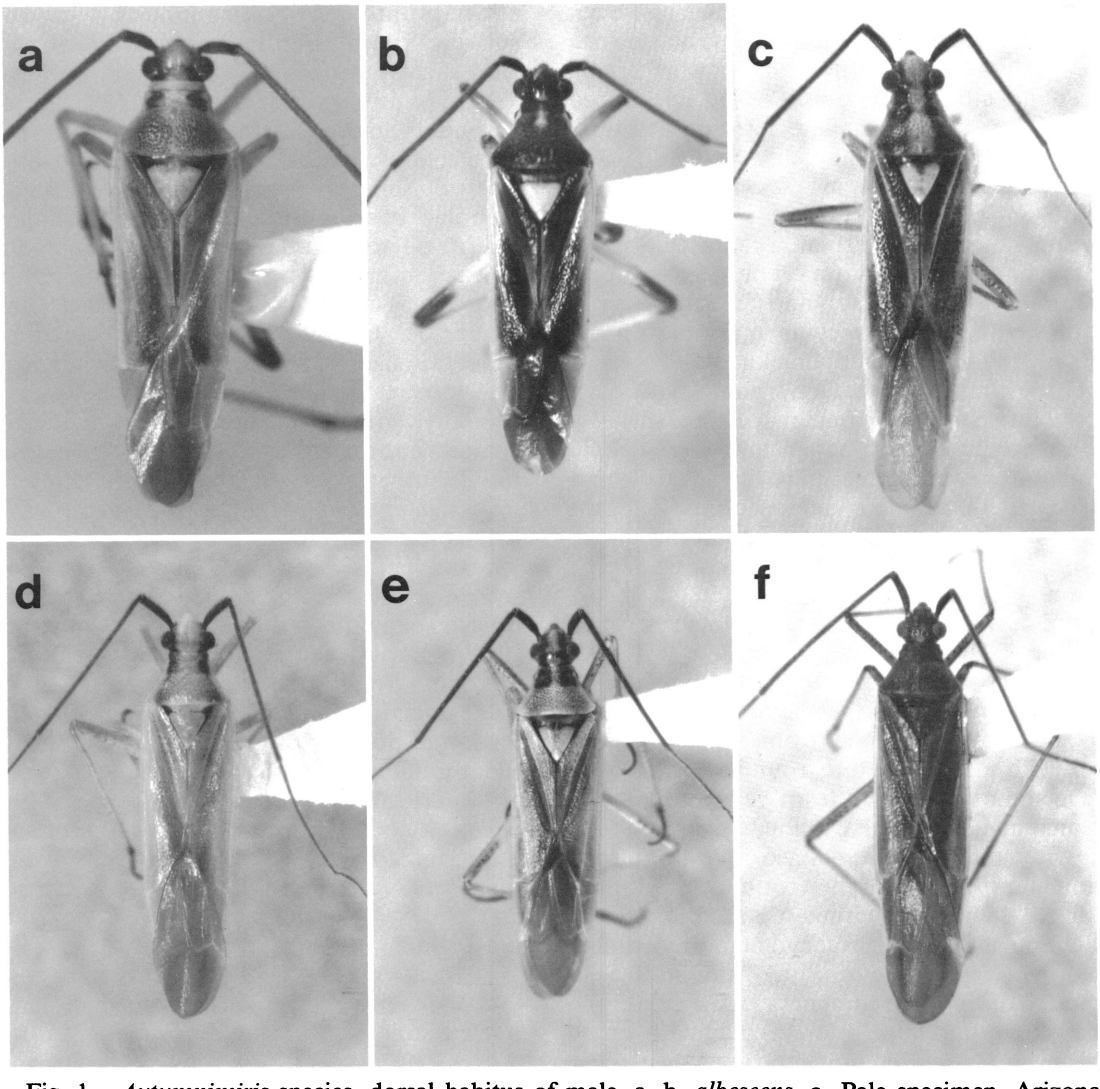

Fig. 1. *Autumnimiris* species, dorsal habitus of male. a, b. *albescens*. **a**. Pale specimen, Arizona, Cochise Co., Chiricahua Mts. **b**. Dark specimen, Mexico, San Luis Potosi. **c**. *guadalupe*, paratype. **d**. *koebelei*, Arizona, Santa Cruz Co. e, f. *roseus*. **e**. Pale specimen, Texas, Culverson Co., Guadalupe Mts. Nat. Pk. **f**. Dark specimen, Mexico, Guanajuato.

truding dorsal labiate plate not forming a ring; and *Porpomiris* has one corkscrew-shaped lobal sclerite, and a small dorsal labiate plate contiguous to the sclerotized rings and not spanning the genital chamber or forming a ring.

All of the species of *Autumnimiris*, as well as those of *Chaetofoveolocoris*, are restricted to semidesert grassland (Brown, 1982). This biotic community is predominated by perennial bunch grasses and adjoins and largely surrounds the Chihuahuan desert with extensive areas found in Chihuahua, western Coahuila, Trans-Pecos Texas, the southern half of New Mexico, southeast Arizona, and extreme northeastern Sonora. Semidesert grassland receives about 60 percent of its annual precipitation during the period from April to September, with perennial grass production dependent primarily on the predictability and the amount of precipitation during this period (Brown, 1982). The vast majority of the

collections records for *Autumnimiris* and *Chaetofoveolocoris* are from late August to early October, and indicate that the phenologies of the species of these grass bug genera are tied to the availability of their host plants.

KEY TO SPECIES OF *AUTUMNIMIRIS*

1. Hemelytra covered with densely distributed, long, erect, pale setae 2
   Hemelytra covered with moderately to sparsely distributed, short, suberect to reclining, pale setae 3
2. Antennal segment I longer than width of head across eyes, length 0.95–1.20 (male and female); length of antennal segment II 3.10–3.70 (male), 3.00–3.60 (female); labium reaching from metacoxa to base of abdomen; pronotum usually with narrow, rufus bilateral vitta; scutellum usually with rufus medial vitta ..... *koebelei* (Van Duzee)
   –Antennal segment I shorter than width of head across eyes, length 0.69–0.75 (male), 0.63 (female); length of antennal segment II 1.96–2.31 (male), 1.88 (female); labium reaching mesocoxa; pronotum with wide, fuscous to piceous bilateral vitta; scutellum sometimes with short fuscous to piceous basomedial vitta ..... *guadalupe*, new species
3. Labium just reaching middle of mesosternum (length: 1.68–1.75, male; 1.80–1.90, female); width of head across eyes 0.90–0.99 (males), 0.95–1.06 (females); lateral margin of pronotum including dorsad of coxal cleft rounded; scutellum pale, femora without fuscous spots and usually rufus distally .... *albescens* (Van Duzee)
   –Labium reaching from base of metacoxae to fourth sternite (length: 2.30–2.90, males; 2.75–3.50, female); width of head across eyes 0.75–0.89 (males), 0.85–0.93 (females); lateral margin of pronotum rounded but carinate dorsad of coxal cleft; scutellum suffused with rufus and/or sometimes with pale medial vitta, femora with fuscous spots and without distal coloration 4
4. Range of ratio of interocular width to length of antennal segment I 0.60–0.72:1.00 (male), 0.66–0.76:1.00 (female); scutellum with deep, darkened punctures; lobal sclerite of vesica large, without opposing spinulae on adjacent portion of membrane (fig. 7d); labium usually reaching abdomen; dorsal coloration often predominantly rufus (see description for variation) ..... *roseus* (Distant)
   –Range of ratio of interocular width to length of antennal segment I 0.51–0.59:1.00 (male), 0.62–0.67:1.00 (female); scutellum with only a few shallow punctures; lobal sclerite of vesica small with opposing patch of spinulae on adjacent portion of membrane (fig. 9d); labium usually just reaching apices of metacoxae, sometimes attaining base of abdomen; dorsal coloration predominantly testaceous white with fuscous cast (see description for variation) ..... *rubicundus* (Uhler)

Autumnimiris albescens (Van Duzee) new combination

Figures 1a, b, 2a–d, 3a

Mesomiris albescens Van Duzee, 1925: 35 (new species).

Porpomiris albescens: Carvalho, 1959: 298 (catalog). – Carvalho and Fontes, 1969: 344 (key, description). – Henry and Wheeler, 1988: 386 (catalog).

HOLOTYPE: Female; Huachuca, Arizona, Aug. 8, [19]'24; Babocomari River; EP Van Duzee collector; HOLOTYPE *albescens*; CAS Type No. 1816; deposited in the CAS. Not examined.

DIAGNOSIS: Recognized by the labium only reaching the middle of the mesosternum; the distinctive pale scutellum usually in contrast to the mostly dark dorsum; and the rufus to piceous distal portion of the femora.

REDESCRIPTION: *Male.* **Dorsal Aspect:** Total length 5.80–6.50; length from apex of tylus to cuneal fracture 4.30–4.65; coloration ranging from mostly testaceous white with fuscous suffusion on antennal segment I, tylus, posteriad of eye, calli, posterior lobe of pronotum, laterally on mesoscutum, clavus, and corium (fig. 1a) to mostly fuscous or piceous with testaceous white patches medially on frons and vertex, between and laterad of calli, scutellum, embolium, and basolaterad of corium and cuneus (fig. 1b); dorsal surface with pale, short, sparse vestiture, and deep punctures on posterior lobe of pronotum, shallow punctures on head, collar, scutellum, and hemelytra. **Head:** Width across eyes 0.90–0.99; interocular width 0.45–0.49; length from posterior margin of eye to apex of tylus in dorsal view 0.60–0.65; rounded tylus short in dorsal view; labium just reaching distad of middle of mesosternum; length 1.68–1.75; antennal coloration variable; segment I from pale testaceous with rufus and fuscous suffusion to piceous; segments II–IV from rufus to fuscous; length of segment I 0.63–0.73; II

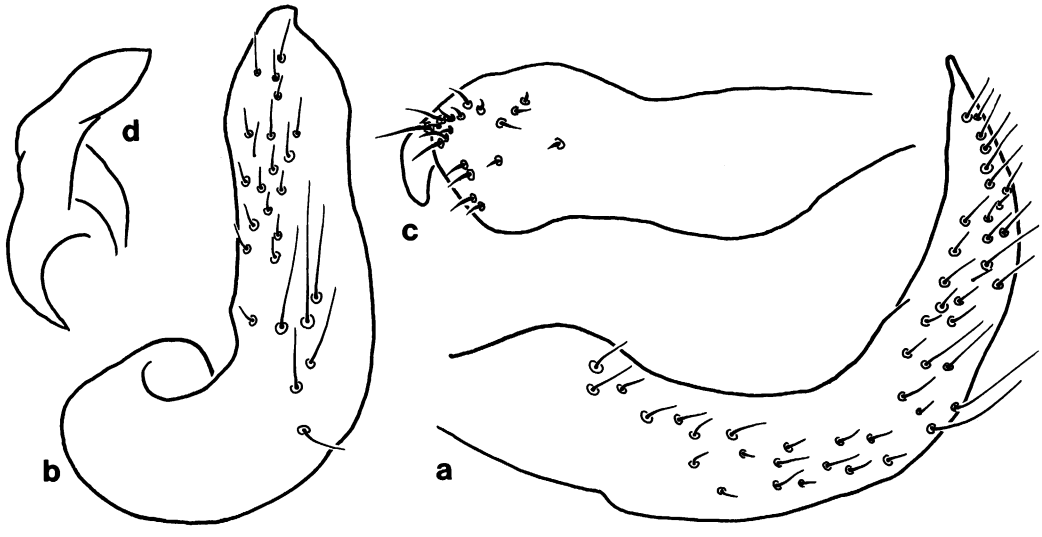

Fig. 2. *Autumnimiris albescens*, male genitalic structures. a, b. Left paramere. **a.** Lateral view. **b.** Distal view. **c.** Lateral view of right paramere. **d.** Lobal sclerite.

2.50–2.70. **Pronotum:** Posterior width 1.43–1.70; lateral margin rounded. **Ventral Aspect:** Testaceous white with variable rufus, fuscous, or piceous suffusion. **Legs:** Pale with rufus, fuscous, or piceous markings on coxa, femora distally, and tibia basally and distally; tarsus piceous. **Genitalia:** Figures 2a–d. *Vesica:* Membrane with simple, linear lobal sclerite. *Right paramere:* Distal portion slightly expanded.

Female. More robust than male, otherwise similar in structure and coloration. **Measurements:** Total length 6.60–7.40; length from apex of tylus to cuneal fracture 5.00–5.30; width across eyes 0.95–1.06; interocular width 0.50–0.55; length from posterior margin of eye to apex of tylus in dorsal view 0.65–0.73; labial length 1.80–1.90; length of antennal segment I 0.71–0.78; II 2.40–2.90; posterior width of pronotum 1.64–1.95.

HOSTS: *Sporobolus* sp.

DISTRIBUTION: Figure 3a. Cochise Co., Arizona to San Luis Potosi, Mexico.

MATERIAL EXAMINED: 53 specimens from these localities – *MEXICO:* SAN LUIS POTOSI: 28.5 mi S of Huizache, 4 July 1985 (TAM); Matehuala, 7 Sept. 1969 (CNC). *UNITED STATES:* ARIZONA: **Cochise Co.:** Babocomari R., Huachuca, 8 Aug. 1924 (1♀ paratype, CAS); Chiricahua Mts., Cave Crk., 5700 ft, 9 Sept. 1958 (UCR); Chiricahua Mts., 0.1 mi S of Paradise Cemetery, 16 Aug. 1976,

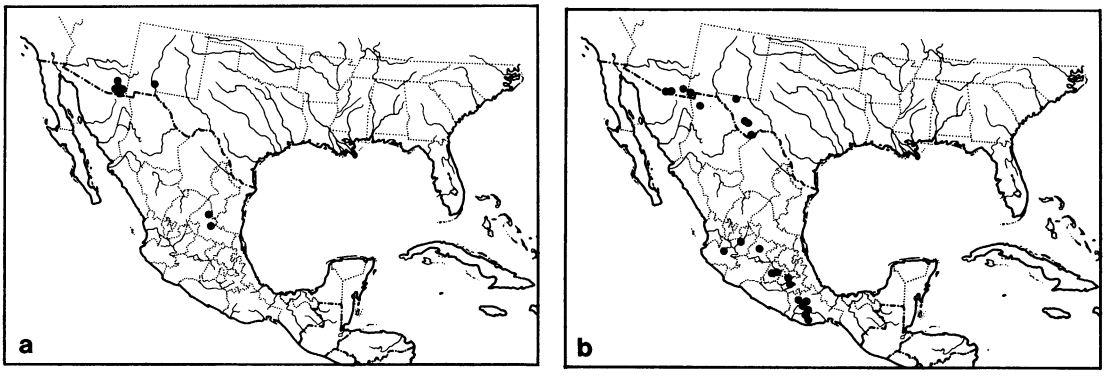

Fig. 3. Distribution of *Autumnimiris* species. **a.** *albescens*. **b.** *roseus*.

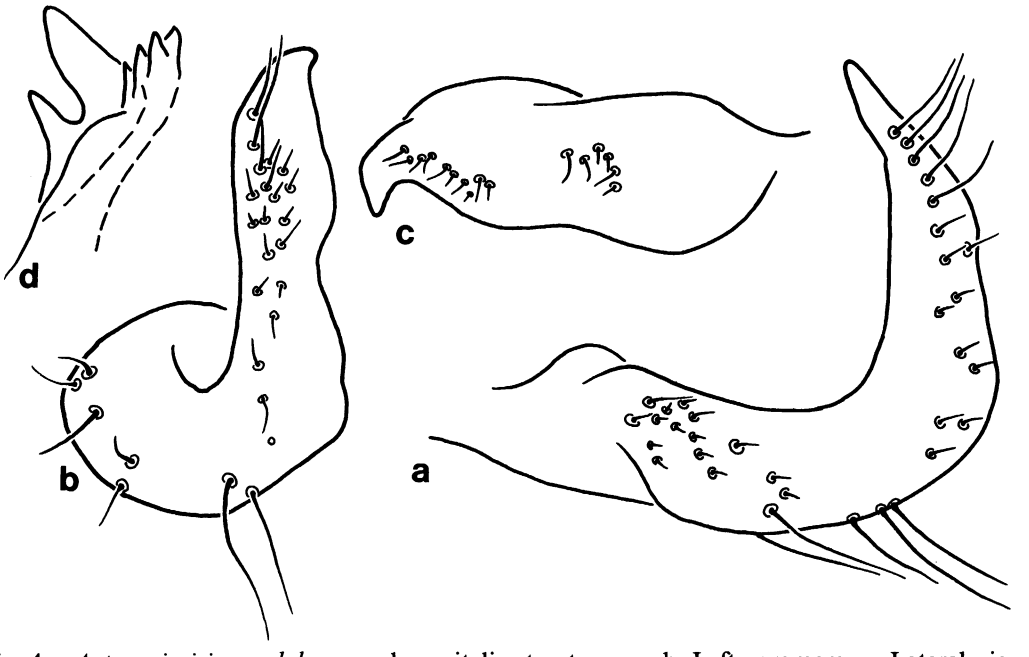

Fig. 4. *Autumnimiris guadalupe*, male genitalic structures. a, b. Left paramere. **a**. Lateral view. **b**. Distal view. **c**. Lateral view of right paramere. **d**. Lobal sclerite.

ex. *Sporobolus* (UCR); Douglas, 13 Aug. 1933 (USNM); 2 mi SE of Willcox, 17 Aug. 1956 (AMNH); Willcox Playa, 22 Aug. 1968 (AMNH). NEW MEXICO: **Doña Ana Co.:** Jornada Expt. Range, 17 mi NE of Las Cruces, 3 Sept. 1970 (USNM).

DISCUSSION: Van Duzee (1925) described *albescens* on the basis of two females from the "Babocomari River near Huachuca Station, Arizona." Carvalho (1952) synonymized *Mesomiris* Reuter (type species *curtulus* Reuter) with *Porpomiris* Berg, and transferred *albescens* (Carvalho, 1959). Carvalho and Fontes (1969), without the aid of any identified specimens, maintained *albescens* in *Porpomiris* solely on the basis of the original description. The inclusion of *albescens* in the new genus, *Autumnimiris*, is established by structures of the genitalia of both sexes.

The specimens of *albescens* collected in Arizona are predominantly pale colored with reduced dark markings on the head, pronotum, and hemelytra. Those specimens collected in Mexico, the southern limit of the range of this species, are extensively darkened. However, regardless of their coloration, all the material on hand, including a paratype deposited in the California Academy of Sciences, possess identical genitalia and are considered conspecific.

Autumnimiris guadalupe, new species
Figures 1c, 4a–d, 6

DIAGNOSIS: Distinguished from *albescens*, *roseus*, and *rubicundus* by the densely distributed, long, erect, pale setae. Differs from *koebelei*, with which it shares the same type of dorsal setae, by the shorter labium and antennal segments I and II; broad dark bilateral pronotal vitta; and the bifurcate lobal sclerite of the male.

DESCRIPTION: *Male.* **Dorsal Aspect:** Total length 6.25–6.66; length from apex of tylus to cuneal fracture 4.30–4.50; coloration testaceous white, with wide, fuscous to piceous bilateral vitta on head and pronotum (fig. 1c); antenna, tylus, mesoscutum, and scutellum basally fuscous to piceous; hemelytra extensively dark infuscate medially; scutellum sometimes with basal marking extending distad on lateral margins and medially; sometimes pronotum with testaceous white ground color with slight greenish cast; dorsal surface with densely distributed, long, erect, pale se-

tae, and deep punctures throughout. **Head:** Width across eyes 0.86–0.89; interocular width 0.36–0.38; length from posterior margin of eye to apex of tylus in dorsal view 0.59–0.63; labium just reaching apex of mesocoxa; length 1.83–2.00; length of antennal segment I 0.69–0.75; II 1.96–2.31. **Pronotum:** Posterior width 1.35–1.43; lateral margin rounded, and carinate dorsad of coxal cleft, vitta as wide as width of calli, extending from collar to posterior margin. **Ventral Aspect:** Pale; abdomen with diffuse, bilateral, fuscous vitta near spiraculae; propleura bordering coxa and genital capsule with fuscous markings. **Legs:** Pale; femora with fuscous spots and slightly infuscate, tibia infuscate, tarsus piceous. **Genitalia:** Figures 4a–d. *Vesica:* Membrane with sharply bifurcate lobal sclerite. *Right paramere:* Distal portion expanded.

Female. Coloration with more contrast between pale and dark areas, otherwise similar to male. **Measurements:** Total length 5.80; length from apex of tylus to cuneal fracture 4.10; width across eyes 0.75; interocular width 0.39; length from posterior margin of eye to apex of tylus in dorsal view 0.60; labial length 1.90; length of antennal segment I 0.63; II 1.88; posterior width of pronotum 1.28.

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

HOLOTYPE: Male; USA, TEXAS, Culverson Co., Guadalupe Mountains National Park, Pine Springs Campground, 5695 ft, September 25, 1988, coll. M. D. Schwartz, ex: mixed native Poaceae; deposited in the AMNH.

PARATYPES: 2♂, 1♀, same data as holotype.

HOSTS: Collected from native grasses, precise species unknown.

DISTRIBUTION: Figure 6. Only known from type locality.

Autumnimiris koebelei (Van Duzee) new combination

Figures 1d, 5a–d, 6

Megaloceroea koebelei Van Duzee, 1921: 118 (new species). – Slater, 1956: 120 (discussion of generic placement). – Carvalho, 1959: 294 (catalog). – Henry and Wheeler, 1988: 385 (catalog).

Megaloceroea letcheri Knight, 1928: 250 (new species). – Slater, 1956: 120 (discussion of generic placement). – Carvalho, 1959: 294 (catalog). – Henry and Wheeler, 1988: 386 (catalog). NEW SYNONYM.

HOLOTYPE: Male; Nogales, Ariz., IX-[19]06; A. Koebele Collector; HOLOTYPE *koebelei*; CAS Type No. 761; deposited in the CAS. Not Examined.

HOLOTYPE OF SYNONYM: Male; Douglas, Arizona, July 23, 1922, H. Lether; deposited in the USNM.

DIAGNOSIS: Distinguished from *albescens*, *roseus*, and *rubicundus* by the densely distributed, long, erect, pale simple setae and the narrow, rufus, bilateral vittae of the dorsum. Differs from *guadalupe* by possessing longer antennal segments I and II, and longer labium.

REDESCRIPTION: *Male.* **Dorsal Aspect:** Total length 6.80–8.40; length from apex of tylus to cuneal fracture 4.80–5.70; coloration testaceous white with rufus bilateral vitta of variable length (fig. 1d); scutellum with rufus vitta medially, usually cuneus rufus to fuscous basally; sometimes clavus and corium extensively infuscate; dorsal surface with densely distributed long, erect, pale setae, and with deep punctures throughout, usually head with obsolete punctures. **Head:** Width across eyes 0.88–0.98; interocular width 0.40–0.45; length from posterior margin of eye to apex of tylus in dorsal view 0.68–0.78; tylus ventrally, base of antennal fossa, and posteriad of eye with rufus to fuscous markings; labium extending to metacoxa or base of abdomen; length 2.70–3.00; antennal segment I with dark markings on dorsal and interior surfaces, pale on ventral and lateral surfaces; length of segment I 0.95–1.20; II 3.10–3.70. **Pronotum:** Posterior width 1.43–1.58; lateral margin rounded, and carinate dorsad of coxal cleft, vitta narrower than width of calli, extending from collar to posterior margin; sometimes vitta diminished on posterior lobe. **Ventral Aspect:** Pale with rufus bilateral vitta. **Legs:** Pale; femora with obscure fuscous spots; tibia distally and tarsus fuscous to piceous. **Genitalia:** Figures 5a–d. *Vesica:* Membrane with lobal sclerite simple, gently curved, tapered, and with variable associated basal spinulae, ranging from absent, to several small spinulae, to one prominent spinose spine (giving the lobal sclerite a U shape). *Right paramere:* Distal portion not expanded.

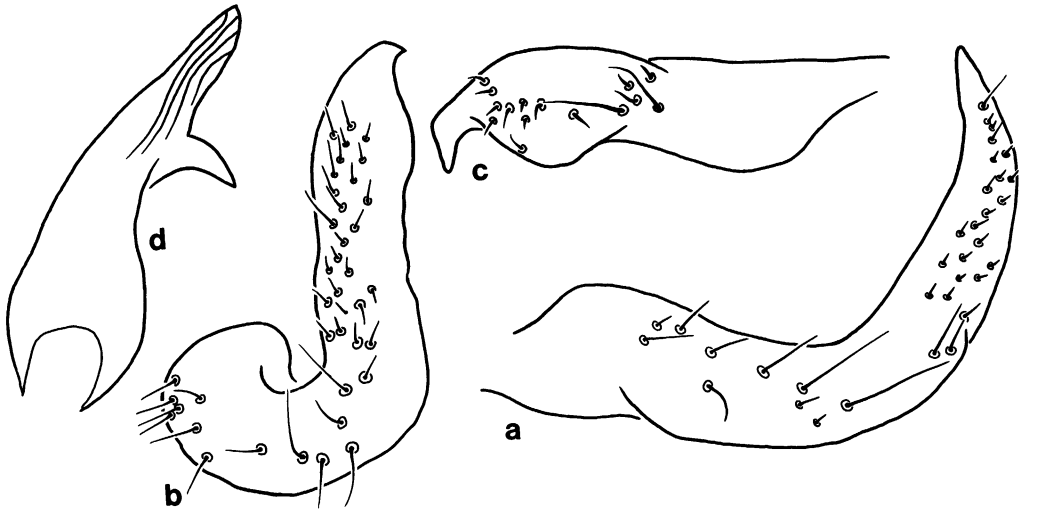

Fig. 5. *Autumnimiris koebelei*, male genitalic structures. a, b. Left paramere. **a**. Lateral view. **b**. Distal view. **c**. Lateral view of right paramere. **d**. Lobal sclerite.

Female. More robust than male, otherwise similar in structure and coloration. **Measurements:** Total length 6.95–8.30; length from apex of tylus to cuneal fracture 5.20–5.90; width across eyes 0.90–0.98; interocular width 0.50–0.54; length from posterior margin of eye to apex of tylus in dorsal view 0.70–0.83; labial length 2.90–3.40; length of antennal segment I 0.95–1.20; II 3.00–3.60; posterior width of pronotum 1.48–1.73.

HOSTS: *Bouteloua curtipendula* and *Trichachne californica*.

DISTRIBUTION: Figure 6. Yavapai Co., Arizona south to Nogales, Mexico, and southeast to Big Bend National Park, Texas.

MATERIAL EXAMINED: 174 specimens from these localities – *MEXICO:* CHIHUAHUA: Sierra de la Escondida (Cauplin Mts.), 10 mi NE of Nuevo Casas Grande, 6000 ft, 3 Oct. 1988 (AMNH). SONORA: Nogales, 1 Sept. 1965 (UCB). *UNITED STATES:* ARIZONA: **Cochise Co.:** Chiricahua Mts.: 14 Sept. 1935 (USNM); Cave Crk., 5400 ft, 9–10 Sept. 1958 (UCR); Rustlers Park (UCR); Hidden Terrace, 5400 ft, 4.5 mi SW of Portal, 16–20 Sept. 1982 (AMNH); Portal, 29 Aug.–3 Sept. 1974 (UCR), 4000–5000 ft, 1 Sept. 1958 (CNC); Southwestern Rsrh. Sta., 5 mi W of Portal, 5400 ft, 2 Sept. 1954 (AMNH), 13 Sept. 1966 (CAS), 8 Aug. & 1 Sept. 1958 (CNC), 25 Aug. 1959 (OSU), 30 Aug. 1958 & 2 Sept. 1965 (UCB), 23 & 27 Aug. 1958 (UCR); Tex Canyon, 5000–6000 ft, 8–30 Sept. 1927 (CAS). Cochise Stronghold, 3–5 Sept. 1965 & 12 Sept. 1964 (UCB); 21 Sept. 1958 (UAZ). Douglas, 30 Aug. 1959 & 1 Sept. 1959 (USNM). Huachuca Mts.: Miller's Cyn., 24 Aug. 1965 (UCR) & 12 Sept. 1977 (USU); Montezuma Cyn., 11 Sept. 1954 (UCD); Huachuca Mts., 17 Sept. 1935 (USNM). Sierra Vista, Sept. 1967 (CNC). **Gila Co.:** 5 mi N of Payson, 5 Sept. 1961 (UCD). **Pima Co.:** Sasabe, 17 Oct. 1937; Santa Catalina Mts., Sabino Cyn., 15 Sept. 1964 (UCB); Santa Rita Range Expt. Sta., 19 Sept. 1978, ex. *Bouteloua curtipendula*, *Trichachne californica* (UAZ); 8 mi N of Sonoita at jct. of Rt. 83 and forest service rd. to Continental, 4800 ft, 28 Sept. 1988, ex. mixed native Poaceae (AMNH); Tucson, 19 Sept. 1928 (USNM); 9 & 10 mi S of I-10 on Rt. 83, 4000 ft, 28 & 30 Sept. 1988 (AMNH). **Pinal Co.:** Maricopa, 17 Oct. 1927 (CAS). **Santa Cruz Co.:** Coronado Nat'l. For. nr. Nogales, 7 Sept. 1959 (USNM). Lochiel: 2 mi N of, 22 Sept. 1978, ex. *Bouteloua curtipendula*; 7 mi E of, 21 Sept. 1978 (UCR); 9 mi E of 7 Sept. 1955 (UAZ). Nogales: Sept. 1906 (2♀ paratypes, CAS); 2 Sept. 1959 (USNM). 10.7 mi SE of Ruby, 29 Aug. 1954 (UCR). Patagonia, Sonoita Crk., 14 Oct. 1927 (CAS). Santa Cruz Co., 20 Sept. 1928 (CNC, UAZ, USNM). Santa Rita Mts.: 4500 ft, 4 Sept. 1945 & 9 Sept. 1925 (USNM); Madera Cyn. 18 Aug.

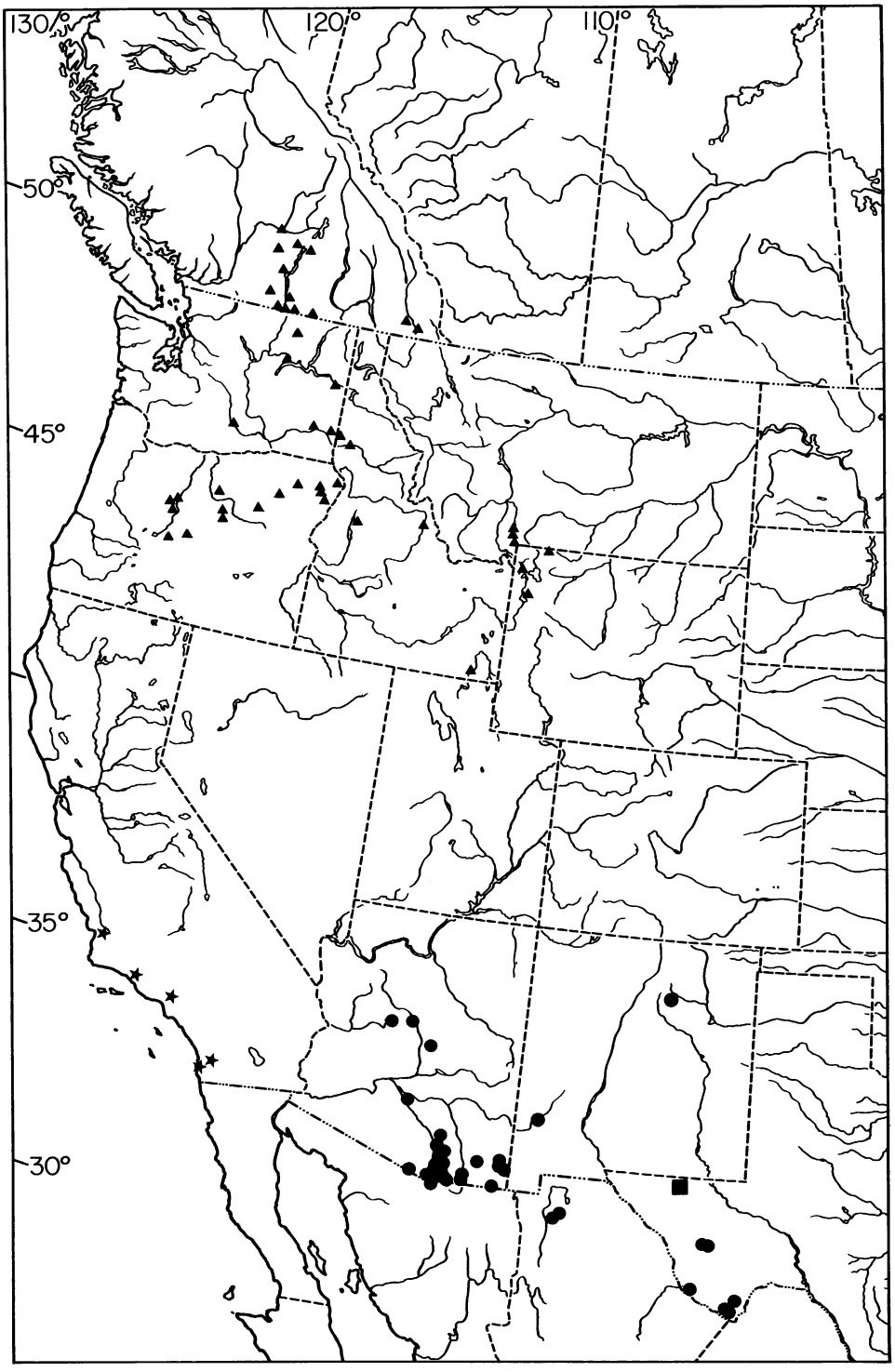

Fig. 6. Distribution of *Autumnimiris* and *Litomiris* species. ■ *A. guadalupe*. ● *A. koebelei*. ▲ *L. curtus*. ★ *L. gracilis*.

1972 (CNC); Madera Cyn., 5100 ft, 6 Sept. 1952 (AMNH); Madera Cyn., Bog Sprg., 11 Sept. 1980 (USU); Box Cyn. 26 Aug. 1959 (UCR). 5 mi N of Sonoita, 22 Sept. 1978 (UCR). Sycamore Cyn., 3 Aug. 1961 (UCD) & 26 Aug. 1961 (UAZ); Ruby Rd. (USU). **Yavapai Co.:** 12 mi SE Cherry, 30 Aug. 1959, roadside grass (UAZ); Prescott, 16 Aug. 1972 (CNC); 4 mi & 5 mi N of Prescott, 5450 ft, 17 Sept. 1972 (LACM). NEW MEXICO: **Grant Co.:** Pinos Altos, 19 Aug. 1972 (CNC). San Miguel Co.: Montezuma, Gallinas Cyn., 22 Aug. 1972 (CNC). TEXAS: **Brewster Co.:** Big Bend Nat'l. Pk.: Chisos Mts., south rim trail, 6700–7200 ft, 16 Aug. 1968 (TAM); Green Gulch, 5700 ft, 14 Aug. 1968 (TAM); Panther Jct., 31 Aug. 1971 (UCD); The Basin, 4 Oct. 1956 (UCB). **Jeff Davis Co.:** 9 mi SE of Ft. Davis, 23 Aug. 1967 (UCD); 8 mi NE of Ft. Davis, 23 Aug. 1968 (TAM); Ft. Davis, 27 Aug. 1969 (TAM). **Presidio Co.:** Presidio, 5 Oct. 1929 (USNM).

DISCUSSION: Van Duzee (1921) described *koebelei* from a male and two females collected in Nogales, Arizona. Knight (1928) described *letcheri* based on a single male from Douglas, Arizona. I have examined the holotype of *letcheri*, and it is in poor condition appearing bleached and without lustre or vittae. Only a male from Sycamore Canyon, Santa Cruz Co., Arizona (USU), of the material on hand has a similar appearance. It is my opinion that this specimen and the holotype of *letcheri* may have been mishandled after capture. Based on comparison of male genitalia, vestiture, and measurements, both are *koebelei*. *Autumnimiris letcheri* and *koebelei* are conspecific, with the latter species the senior synonym.

Autumnimiris roseus (Distant) new combination

Figures 1e, f, 3b, 7a–f

Miris roseus Distant, 1883: 236, pl. 23, fig. 20 (new species). – Carvalho and Dolling, 1976: 805 (lectotype designation).

Ophthalmomiris reuteri: Carvalho not Berg, 1946: 8 (new combination and new synonym). – Carvalho, 1959: 298 (catalog).

Neotropicomiris roseus: Carvalho and Fontes, 1969: 339 (new combination, key, description).

Megaloceroea punctata Knight, 1928: 249 (new species). – Carvalho, 1959: 294 (catalog). NEW SYNONYM.

Litomiris punctatus: Slater, 1956: 120 (as *punctata*; new combination). – Knight, 1968: 179 (key, distribution). – Henry and Wheeler, 1988: 385 (catalog).

LECTOTYPE: Female; Oaxaca; deposited in the Berlin Museum. Not examined.

HOLOTYPE OF SYNONYM: Male; Nogales, Arizona, VIII:24:06; Col. by F.W. Nunenmacher; HOLOTYPE (By H.H. Knight) *Megaloceroea punctata*; deposited in the USNM.

DIAGNOSIS: Differs from *albescens* and *koebelei* by the longer labium and sparse, short dorsal setae, respectively; distinguished from *guadalupe* by both of these attributes. Easily confused with *rubicundus* on the basis of coloration and structure, but distinguished by the larger ratio of interocular width to length of antennal segment I; deeply punctate scutellum; usually longer labium; and the simple, large lobal sclerite of the male.

REDESCRIPTION: *Male.* **Dorsal Aspect:** Total length 5.50–6.80; length from apex of tylus to cuneal fracture 3.90–4.80; coloration variable—from testaceous white with head, calli, mesoscutum, and clavus with piceous markings, and corium and cuneus with rufus suffusion (fig. 1e)—to rufus suffusion with head, pronotum and scutellum extensively piceous, and head, posteromedial margin of pronotum, and embolium testaceous white (fig. 1f); dorsal surface with sparsely distributed, short, pale setae, and with deep, darkened punctures, on pronotum, scutellum, clavus, and sometimes corium. **Head:** Width across eyes 0.75–0.89; interocular width 0.38–0.43; length from posterior margin of eye to apex of tylus in dorsal view 0.60–0.68; tylus of moderate length; labium extending beyond base of abdomen as far as fourth sternite; length 2.40–2.90; antenna fuscous to piceous, sometimes segment II-IV slightly paler; length of segment I 0.57–0.68; II 2.40–3.10. **Pronotum:** Posterior width 1.18–1.50; triangular in dorsal view or trapezoidal in specimens with shortened hemelytra; lateral margin rounded, carinate dorsad of coxal cleft. **Hemelytra:** Usually tip of abdomen reaching to base of cuneus in lateral view; in specimens with shorter hemelytra, tip of abdomen reaches membrane distad of apex of cuneus. **Ventral**

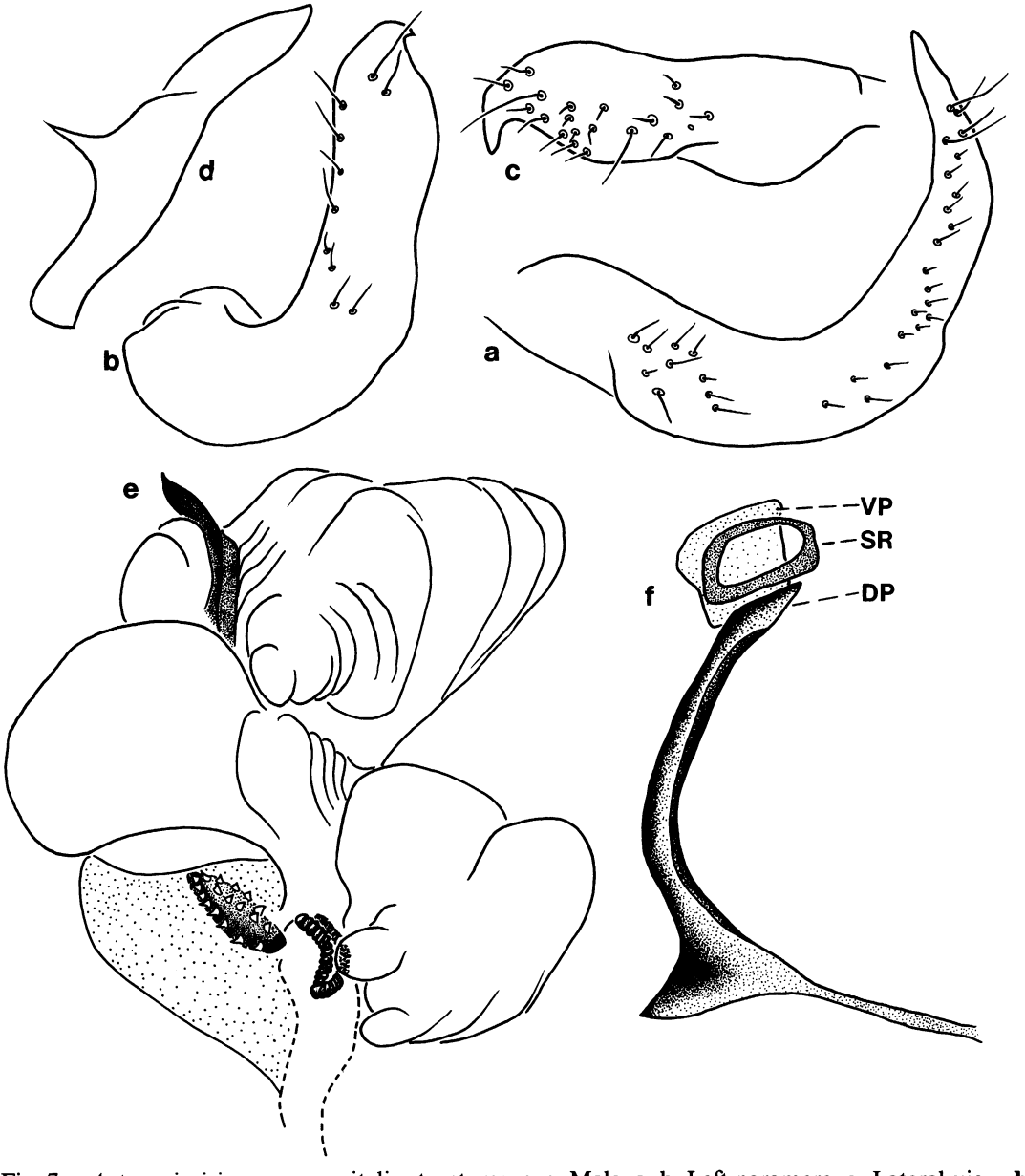

Fig. 7. *Autumnimiris roseus*, genitalic structures. a–e. Male. a, b. Left paramere. **a**. Lateral view. **b**. Distal view. **c**. Lateral view of right paramere. **d**. Lobal sclerite. **e**. Vesica. **f**. Female: sclerotized ring (SR); dorsal labiate plate (DP); ventral labiate plate (VP).

Aspect: With variable dark markings, sometimes mostly pale. **Legs:** Pale; femora with fuscous spots; coxa, tarsus, tibia apically fuscous to piceous; sometimes coxa pale. **Genitalia:** Figure 7a–e. *Vesica:* Membrane with simple, tapered lobal sclerite, base of sclerite without associated spinulae, sometimes sclerite with single preapical spinula. *Right paramere:* Distal portion not expanded.

Female. More robust than male, otherwise similar in structure and coloration. **Measurements:** Total length 6.20–7.20; length from apex of tylus to cuneal fracture 4.50–5.10; width across eyes 0.85–0.93; interocu-

lar width 0.45–0.53; length from posterior margin of eye to apex of tylus in dorsal view 0.65–0.78; labial length 2.90–3.50; length of antennal segment I 0.63–0.75; II 2.60–3.00; posterior width of pronotum 1.40–1.68.

HOST: *Bouteloua hirsuta.*

DISTRIBUTION: Figure 3b. Cochise Co., Arizona, east to Brewster Co., Texas south to Oaxaca, Mexico.

MATERIAL EXAMINED: 229 specimens form these localities – *MEXICO:* CHIHUAHUA: Foothills of Sierra Madre, 15 mi W of Colonia Juarez, 6500–7000 ft, 2 Oct. 1988 (AMNH); Sierra de la Escondida (Cauplin Mts.), 10 mi NE of Nuevo Casas Grande, 6000 ft, 3 Oct. 1988 (AMNH). GUANAJUATO: Ojo de Aqua, 6 Sept. 1969 (CNC). JALISCO: Guadalajara (CAS); Jalostotitlan, 4 Aug. 1954 (compared with type by Carvalho, UCB). MEXICO: 6 mi N of Aculco, 18 Aug. 1954 (CNC); Encinello, 2 Sept. 1969 (CNC); Jilotepec, 2 Sept. 1969 (CNC); Matilde, 27 Aug. 1956 (MZH, USNM); 15 mi NW of Toluca (CNC); 22 mi N of Toluca, 8800 ft, 17 Aug. 1954 (CNC); Valley (CAS). OAXACA: Ejulta, 23 Aug. 1969 (CNC); 7 mi S of Ejutla, 20 July 1974 (TAM); Huajuapan de Leon, 1597 m, 13 Sept. 1948 (UMNZ), 25 Aug. 1969 (CNC); 2 mi N of Miahuatlan, 14 July 1973; 14 mi N of Miahuatlan, 15 & 16 July 1974 (TAM); Mitla, 17 Aug. 1969 (CNC); Morelos, 24 Aug. 1969 (CNC); Nochixtlan (UMNZ), 24 Aug. 1969 (CNC); Oaxaca (CAS, CNC); Oaxaca, 20 July 1937 (compared with type by Carvalho, UCB), 21 Aug. 1969 (CNC); 15 mi SE Tamazulapan, 6 Sept. 1972 (USNM); Tejupan, 24 Aug. 1969 (CNC); 18 mi SE of Tlacolula, 6500 ft, 12 Aug. 1974 (CAS). PUEBLA: 9 mi W of Izucar de Matamoros, 16 Sept. 1972 (USU). *UNITED STATES:* ARIZONA: **Cochise Co.:** Chiricahua Mts., 6400 ft, 5 Oct. 1964 (AMNH); Palmerlee, Oct. (USNM). **Santa Cruz Co.:** 2 mi N of Lochiel, 22 Sept. 1978, ex. *Bouteloua hirsuta* (UCR); Nogales, 16 Aug. 1906 (USNM); Santa Cruz Co., 20 Sept. 1928 (CNC, USNM). NEW MEXICO: **Hidalgo Co.:** Animas Mts., Indian Crk, 6000 ft, 22 Sept. 1972 (OSU). TEXAS: **Brewster Co.:** Big Bend Nat'l. Pk.: Green Gulch, 4700 ft, 14 Aug. 1968 (TAM). **Culverson Co.**, Guadalupe Mts. Nat'l. Pk., Pine Sprgs. Cmpgrnd., 5695 ft, 25 Sept. 1988 (AMNH). **Jeff Davis Co.:** 2 mi N of H. O. Cyn., W of Ft. Davis, 17 Aug. 1969 (TAM); H. O. Cyn., W of Ft. Davis, 23 Aug. 1969 (TAM); 8 mi E of Ft. Davis, 23 Aug. 1968 (TAM); Madera Cyn., W of Ft. Davis, 23 Aug. 1969 (TAM).

DISCUSSION: Distant (1883) described *roseus* based on one female from Oaxaca, Mexico; Carvalho and Dolling (1976) designated this specimen the lectotype. Carvalho (1946) placed *roseus* as the junior synonym of *Ophthalmomiris reuteri* after comparing the original description and dorsal habitus of *roseus* (Distant, 1883) to specimens of *reuteri*. After examining the types of *reuteri* and *roseus*, Carvalho and Fontes (1969) concluded that these species were not synonyms nor congeneric, and erected *Neotropicomiris* to accommodate *roseus* and five other species designating their new species *Neotropicomiris pilosus* as the type species. Based on my examination of the genitalia of both sexes, *roseus* is correctly placed in the new genus *Autumnimiris*.

Knight (1928) described *punctata* on the basis of three specimens from Nogales, Arizona. I have examined all the type material of *punctata* and the specimens are typical of the pale testaceous specimens of *roseus* from southern Arizona and west Texas. I have concluded that *punctata* is the junior synonym of *roseus* because of the similiar coloration, genitalia, and measurements.

Autumnimiris rubicundus (Uhler) new combination

Figures 8, 9a–d, 10

Miris rubicundus Uhler, 1871: 471 (list, name not available).

Megaloceroea rubicunda Uhler, 1872: 409 (new species). – Van Duzee, 1916: 36 (checklist); 1917, 305 (catalog). – Knight, 1928: 251 (redescription, discussion). – Carvalho, 1959: 295 (catalog).

Litomiris rubicundus: Slater, 1956: 120 (as *rubicunda*; new combination). – Knight, 1968: 178 (key, distribution). – Henry and Wheeler, 1988: 385 (catalog).

LECTOTYPE: Male; Col; Aug; PR Uhler; *Miris rubicundus* Uhler; *Megaloceroea rubicunda* Uhler, det. M. D. Schwartz, 1988 LECTOTYPE; deposited in the USNM.

DIAGNOSIS: Similar to *roseus* but differs from it by the smaller ratio of the interocular

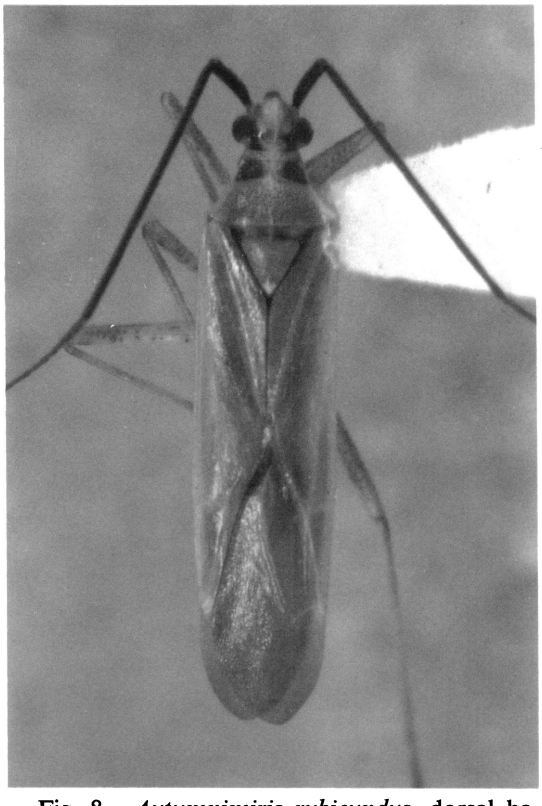

Fig. 8. *Autumnimiris rubicundus*, dorsal habitus of male.

width to length of antennal segment I; the smooth, or sparsely and shallowly punctate scutellum; the frequently shorter labium; and the smaller lobal sclerite with adjacent patch of spinulae.

REDESCRIPTION: *Male.* **Dorsal Aspect:** Total length 5.80–7.40; length from apex of tylus to cuneal fracture 4.10–5.00; coloration testaceous white with variable rufus cast on hemelytra, and variable fuscous to piceous markings on head, calli, mesoscutum, and scutellum (fig. 8); dorsal surface with sparsely distributed, short, pale setae and deep, darkened punctures on pronotum; head, scutellum, and hemelytra with few shallow punctures. **Head:** Width across eyes 0.80–0.88; interocular width 0.35–0.43; length from posterior margin of eye to apex of tylus in dorsal view 0.58–0.70; tylus of moderate length; posteriad and interiad of eye (surrounding medial portion of vertex), tylus, and juga fuscous to piceous; sometimes only medialmost portion of vertex and frons pale; labium reaching metacoxae or sometimes base of abdomen; length 2.30–2.60; antenna fuscous to piceous; length of segment I 0.60–0.73; II 2.60–3.20. **Pronotum:** Posterior width 1.11–1.41; triangular in dorsal view; lateral margin rounded, carinate dorsad of coxal cleft; posterior lobe sometimes with diffuse fuscous cast; only medialmost portion pale. **Ventral Aspect:** Pale with variable fuscous to piceous markings. **Legs:** Pale; femora with fuscous spots; tibia distally and tarsus fuscous to piceous; sometimes coxa and tibia extensively darkened. **Genitalia:** Figures 9a–d. *Vesica:* Membrane with simple, tapered lobal sclerite of variable size with variable size field of associated spinulae basad and on opposing portion of membrane. *Right paramere:* Distal portion slightly tapered distad.

Female. More robust than male, otherwise similar in structure and coloration. **Measurements:** Total length 6.50–7.25; length from apex of tylus to cuneal fracture 4.60–5.10; width across eyes 0.88–0.93; interocular width 0.45–0.53; length from posterior margin of eye to apex of tylus in dorsal view 0.73–0.76; labial length 2.75–2.90; length of antennal segment I 0.70–0.75; II 2.70–3.10; posterior width of pronotum 1.45–1.68.

HOSTS: Unknown.

DISTRIBUTION: Figure 10. Coconino Co., Arizona east to Texas Co., Oklahoma, south to Presidio Co., Texas.

MATERIAL EXAMINED: 142 specimens from these localities – *UNITED STATES:* ARIZONA: **Apache Co.:** roadside picnic area just S of Alpine on Rt. 666, 15 Sept. 1970 (CAS); 5 mi N of Concho, 25 Sept. 1964 (UCR); 32 mi W of Springerville, 8 Aug. 1941 (UCR); Mountain Meadow at Alpine Summit on Rt. 666, 15 Sept. 1970 (CAS); 20 mi E of Show Low, 26 Aug. 1965 (TAM). **Cochise Co.:** Douglas, 25 July 1922 (USNM). Chiricahua Mts.: Cave Crk. Cyn., Sept. 1978 (USU); Chiricahua Mts., 14 Sept. 1935 (USNM); Hidden Terrace, 5400 ft, 4.5 mi SW of Portal, 16–20 Sept. 1982 (AMNH); Sierra Vista, Oct. 1967 (CNC); Southwestern Res. Sta., 5 mi W of Portal, 5400 ft, 13 Sept. 1966 (CAS). **Coconino Co.:** Flagstaff, 9 Sept. 1951 (UCD). **Navajo Co.:** Clay Sprgs., 3 Sept. 1967 (CAS). **Pima Co.:** 8 mi N of Sonoita at jct. of Rt. 83 and forest service rd. to Continental, 4800 ft,

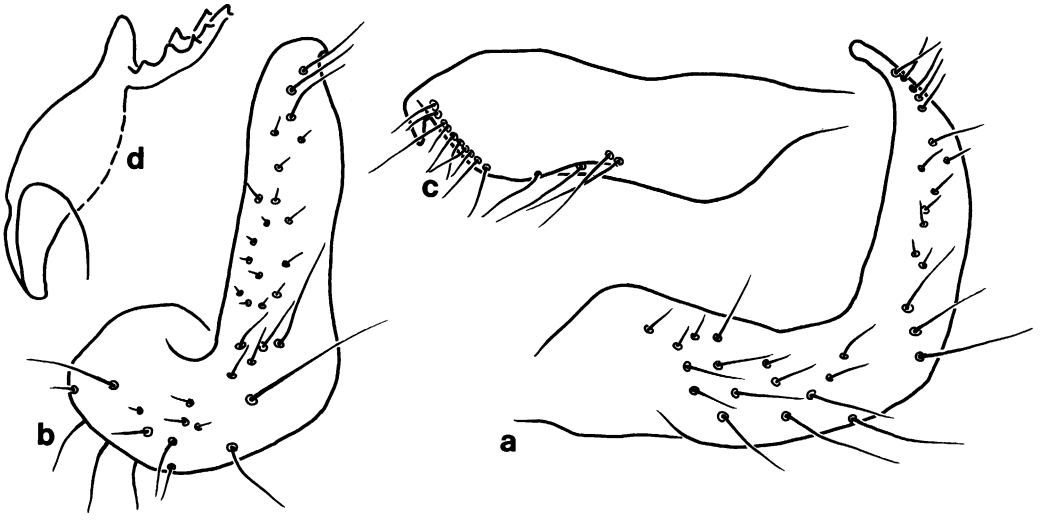

Fig. 9. *Autumnimiris rubicundus*, male genitalic structures. a, b. Left paramere. **a**. Lateral view. **b**. Distal view. **c**. Lateral view of right paramere. **d**. Lobal sclerite.

28 Sept. 1988, ex. mixed native Poaceae (AMNH). **Santa Cruz Co.:** 11 mi N of Sonita, 5 Sept. 1955 (UAZ). COLORADO: **County ?:** Col., Aug. (USNM); S. Col. [handwritten]; PR Uhler; (1♂ paralectotype, USNM). [no locality, prob. E. Colorado] *Miris rubicundus* Uhler, [I. or l.] [handwritten]; TYPE 1117 U.S.N.M. (1♀ paralectotype, USNM). NEW MEXICO: **Catron Co.:** 31 mi W of Quemado, 26 Aug. 1965 (TAM); White Mts., S Frk. Eagle Crk., 8000 ft, 16 Aug. [?] (USNM). **Colfax Co.:** 5 mi E of Eagle's Nest, 8 Aug. 1969 (TAM); Colfax Co., 21 Aug. 1927 (KU). **Grant Co.:** Pinos Altos, 2000–2100 m, 30 Aug. 1977 (TAM). **Guadalupe Co.:** Santa Rosa, 23 July 1941 (KU). **Los Alamos Co.:** Los Alamos Mortandad Cyn., 2190 m, Sept. 1976–Feb. 1977 (AMNH). **Otero Co.:** 4 mi E of Cloudcroft, 26 Sept. 1979 (TAM). **San Miguel Co.:** Montezuma, Gallinas Cyn., 22 Aug. 1972 (CNC). **Socorro Co.:** Magdalena, Cibola Nat'l. For., 21 Aug. 1972 (CNC). **Torrance Co.:** Torrance Co., July 1925 (KU). OKLAHOMA: **Texas Co.:** Guymon, 21 June 1941 (KU). TEXAS: **El Paso Co.:** El Paso Co., 18 July 1927 (CNC, KU, USNM). **Jeff Davis Co.:** Madera Cyn., Davis Mts., W of Ft. Davis, 9 & 17 Aug. 1969 (TAM). **Presidio Co.:** Marfa, 2 Oct. 1967; 15 mi S of Marfa, 13 Aug. 1967; 11 mi N of Shafter, 8 Aug. 1968 (TAM).

DISCUSSION: Uhler (1871) presented a list of bugs collected in eastern Colorado during 1969 by C. Thomas on the Hayden Expedition of 1869. This list contained only the name *Miris rubicundus* Uhler and did not include a description. Uhler (1872) described *rubicundus* from a type series containing specimens from Colorado. I located a female in the National Museum, Washington, D.C. with a red type label (number 1117) however, this lectotype designation was never published and is therefore invalid. I have selected a male from Colorado, with a determination label in Uhler's handwriting as the lectotype. The female and another male are paralectotypes and are under Material Examined.

CARACORIS, NEW GENUS

TYPE SPECIES: *Caracoris nigopunctatus*, new species.

DIAGNOSIS: Similar to *Neotropicomiris* with the dorsal surface shining with deep, distinct punctures throughout, the labium reaching the middle of the abdomen, and the eyes separated from the pronotum; but differs by the long antefossal portion of the head, and the pronotum without distinct anterior and posterior lobes. The genitalia further distinguish the genus by the following: vesica of the male without sclerotized processes or lobal sclerites and with a small spinous patch near the secondary gonopore (fig. 12d); and the dorsal labiate plate of the female not adhering to the

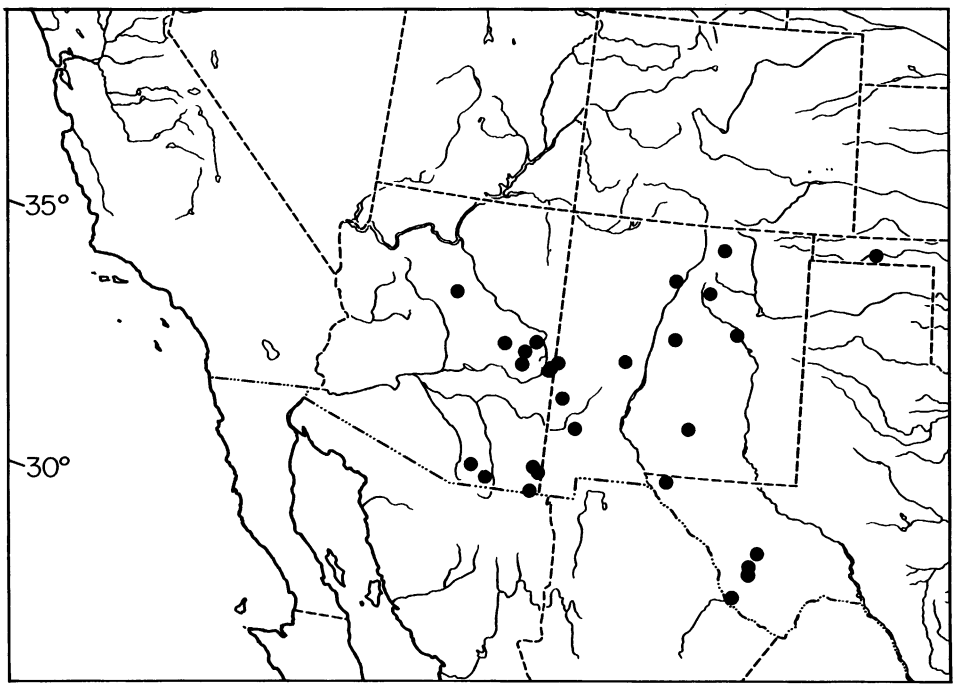

Fig. 10. Distribution of *Autumnimiris rubicundus*.

ramae distally, and with a slanted projection caudad of the sclerotized rings (fig. 12e).

DESCRIPTION: **Dorsal Aspect:** Total length 4.50–4.80; general coloration including antennae and legs reddish; head, pronotum, and scutellum with fuscous cast; punctures and sulci piceous; embolium and lateral margin of cuneus testaceous; head, pronotum, mesoscutum, scutellum, and basal portion of hemelytra with deep punctures. **Vestiture:** Head and pronotum with sparsely distributed, short, erect, pale simple setae; pronotum with much longer setae. **Head:** Acutely pentangular in dorsal view; rectangular in lateral view; eyes separated from pronotum by distance equal to distal width of antennal segment I; vertex ecarinate and flat; frons produced anterodorsad and just dorsad of eyes in lateral view; labium reaching middle of abdomen; segment I long, reaching anterior margin of procoxae. **Antennae:** Segment I tapered at base, bowed. **Pronotum:** Subtriangular with proepisternum rounded, produced, and just barely visible in dorsal view; without anterior and posterior lobes; calli weakly differentiated, subconfluent anteromedially, just reaching lateral margins of pronotum; collar flattened; pronotum with posterior half of lateral margin rounded, anterior half carinate and strongly bridged dorsad of coxal cleft. **Mesoscutum and Scutellum:** Confluent medially, mesoscutum moderately exposed. **Hemelytra:** Macropterous; embolium wide. **Legs:** Length of metafemora even with abdomen. **Male Genitalia:** *Genital capsule:* Without tubercles dorsal of paramere insertions; posteroventral portion of capsule narrowed and slightly produced. *Left paramere:* Small; surface smooth; without sensory lobe. *Right paramere:* Distal portion expanded with small spine apically. *Vesica:* Without spiculae, only with spinose lobes, and small spinose patch near gonopore. **Female Genitalia:** *Sclerotized rings:* Shape small, open, and subovoid. Dorsal labiate plate: Present caudad of rings, slanted toward adjacent portion of ramae, and with small caudally projecting process. Ventral labiate plate: Present behind lateral one-fourth of, and not spanning, rings. *Posterior wall:* Inter-ramal sclerite: Moderate depth, ventral margin notched. Median process: Small, with anterior plate. Dorsal structure: Small, not surrounding median process, dorsal area occu-

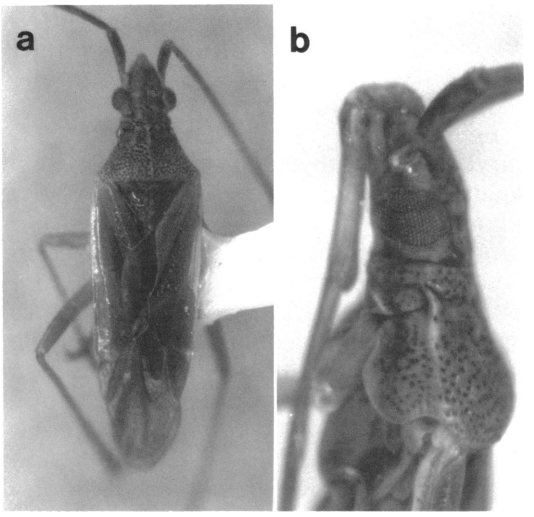

Fig. 11. *Caracoris nigopunctatus*, male, paratype. **a**. Dorsal habitus. **b**. Lateral view of head and pronotum.

pied by membranous extension of inter-ramal lobes. Inter-ramal lobes: Large, rectangular, obscuring sclerite slightly rounded interomedially. Oviducts: Common and laterals broadly joined anterolaterally.

ETYMOLOGY: Named for the occurrence of this taxon in Serra dos Carajas, Brazil; neuter.

Caracoris nigropunctatus, new species
Figures 11a, b, 12a–f

DIAGNOSIS: Recognized by the deep, darkly colored punctures of the head, pronotum, scutellum, and basal portion of the hemelytra; general reddish coloration; elongated anteocular and antefossal portion of the head; pronotum without distinct anterior and posterior lobes; and by the structure of the male genitalia, especially the strongly spinose membranous lobes of the vesica (fig. 12e).

DESCRIPTION: *Male.* As in generic description. **Measurements:** Head: Width across eyes 0.69–0.70; width of vertex 0.35–0.36; length of antennal segment I 0.58; length of antennal segment II 2.48. Pronotum: Posterior width

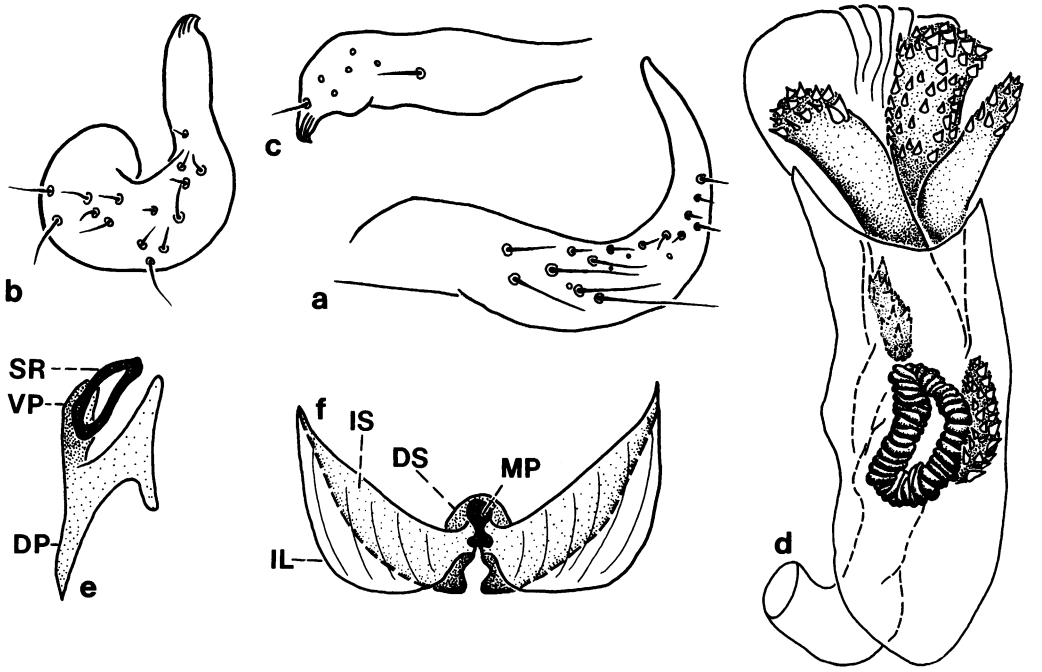

Fig. 12. *Caracoris nigopunctatus*, genitalic structures. a–d. Male. a, b. Left paramere. **a**. Lateral view. **b**. Distal view. **c**. Lateral view of right paramere. **d**. Vesica. e, f. Female. **e**. Sclerotized ring (SR); dorsal labiate plate (DP); ventral labiate plate (VP). **f**. Posterior wall: inter-ramal sclerite (IS); median process (MP); dorsal structure (DS); inter-ramal lobes (IL).

1.08–1.14; median length 0.72–0.73. **Genitalia:** As in figures 12a–d.

Female. Length 4.75. Slightly more robust than male, otherwise as in generic description. **Measurements:** Head: Width across eyes 0.66; width of vertex 0.36; length of antennal segment I 0.50; length of antennal segment II 1.93. Pronotum: Posterior width 1.03; median length 0.75. **Genitalia:** As in figures 12e, f.

ETYMOLOGY: Named for the deep, darkly colored punctures of the dorsum of these bugs.

HOLOTYPE: Male; Brazil, Pará, Serra dos Carajas, 6°S lat., 50°18′W long., 720 m, March 25–27, 1974, R. T. and J. C. Schuh; sweeping sedge meadow; deposited in the Museu Nacional, Rio de Janeiro, Brazil.

PARATYPES: 4♂, same data as holotype (AMNH). 1♀, Venezuela: Bolivar: Northern edge of Gran Sabana, at Pioneer Monument, March 21, 1982, G. F. and J. F. Hevel (USNM).

CHAETOFOVEOLOCORIS KNIGHT

Chaetofoveolocoris Knight, 1968: 179. – Henry and Wheeler, 1988: 382 (catalog).

TYPE SPECIES: *Megaloceroea hirsuta* Knight by monotypy.

DIAGNOSIS: Unique among genera of the *Stenodema* group by the long vestiture; the shagreened, impunctate dorsal surface, the eyes contiguous to the pronotum; the short labium; and the large produced meso and metafemoral trichoma. The genus is further recognized by the male genitalia with tubercles dorsad of the paramere insertions (figs. 13a, 16a), moderately produced posteroventral portion of the capsule, sensory lobe of the left paramere large and quadrate (figs. 13b, 16b), very large apical spine of the right paramere (figs. 13d, 16d), vesica without sclerotized processes; and the female genitalia with large, elongate sclerotized rings (fig. 13f), and a pair of isolated dorsal labiate plates located centrally, beneath the genital chamber (fig. 13f).

DESCRIPTION OF GENITALIA: *Male. Genital capsule:* With tubercles present dorsad of paramere insertions, left large, right small; posteroventral portion of capsule moderately produced. *Left paramere:* With large, rectangular sensory lobe; arm subequal to shaft in length; shaft with distal flange on outer surface; surface smooth. *Right paramere:* Expanded distal lobe with very large, ventrally directed apical hook. *Vesica:* With a strongly spinose covered lobe, without sclerotized processes or lobal sclerites.

Female. Sclerotized rings: Large, open, and curved. Dorsal labiate plate: Isolated, present caudad of medial portion of rings. Ventral labiate plate: Narrow, present behind lateralmost margin of, and not spanning, rings. *Posterior wall:* Inter-ramal sclerite: Large, with concave ventral margin. Median process: Small, not projecting ventrad of sclerite, extending anteriad into dorsal structure. Dorsal structure: Very large, saclike with dorsal surface flattened. Inter-ramal lobes: Obscuring one-half of sclerite; dorsal membranous extension surrounding periphery of dorsal structure.

Chaetofoveolocoris hirsutus (Knight)

Figures 13a–f, 14a, 15

Megaloceroea hirsuta Knight, 1928: 248 (new species). – Slater, 1956: 120 (discussion of generic placement). – Carvalho, 1959: 294 (catalog).

Chaetofoveolocoris hirsutus: Knight, 1968: 180 (new combination, distribution). – Henry and Wheeler, 1988: 382 (catalog).

HOLOTYPE: Male; Santa Rita Mts., Pima Co., Ariz., Sept. 26, 1925, C. T. Vorhies; (HOLOTYPE By H. H. Knight), *Megaloceroea hirsuta*; deposited in the USNM.

DIAGNOSIS: Differs from *parsoni* by the shorter body and antennal segments I and II.

REDESCRIPTION: *Male.* **Dorsal Aspect:** Total length 8.40–9.80; length from apex of tylus to cuneal fracture 5.70–6.40; testaceous; hemelytra with fuscous suffusion; head, pronotum, and mesoscutum with fuscous to piceous bilateral vitta; dorsal surface, antenna, and legs with moderately distributed, long, erect pale setae (fig. 14a). **Head:** Width across eyes 0.88–0.98; interocular width 0.38–0.43; length from posterior margin of eye to apex of tylus in dorsal view 0.75–0.78; tylus of moderate length, slightly bulbose; vitta confined to base of antennal fossa, and posteriad of eye; sometimes tylus fuscous ventrally, labium reaching apex of mesosternum, length 2.00–2.50; antenna pale or fuscous, length of segment I 1.30–1.70; II 3.00–3.90. **Pronotum:** Posterior width 1.33–1.58; lateral margin

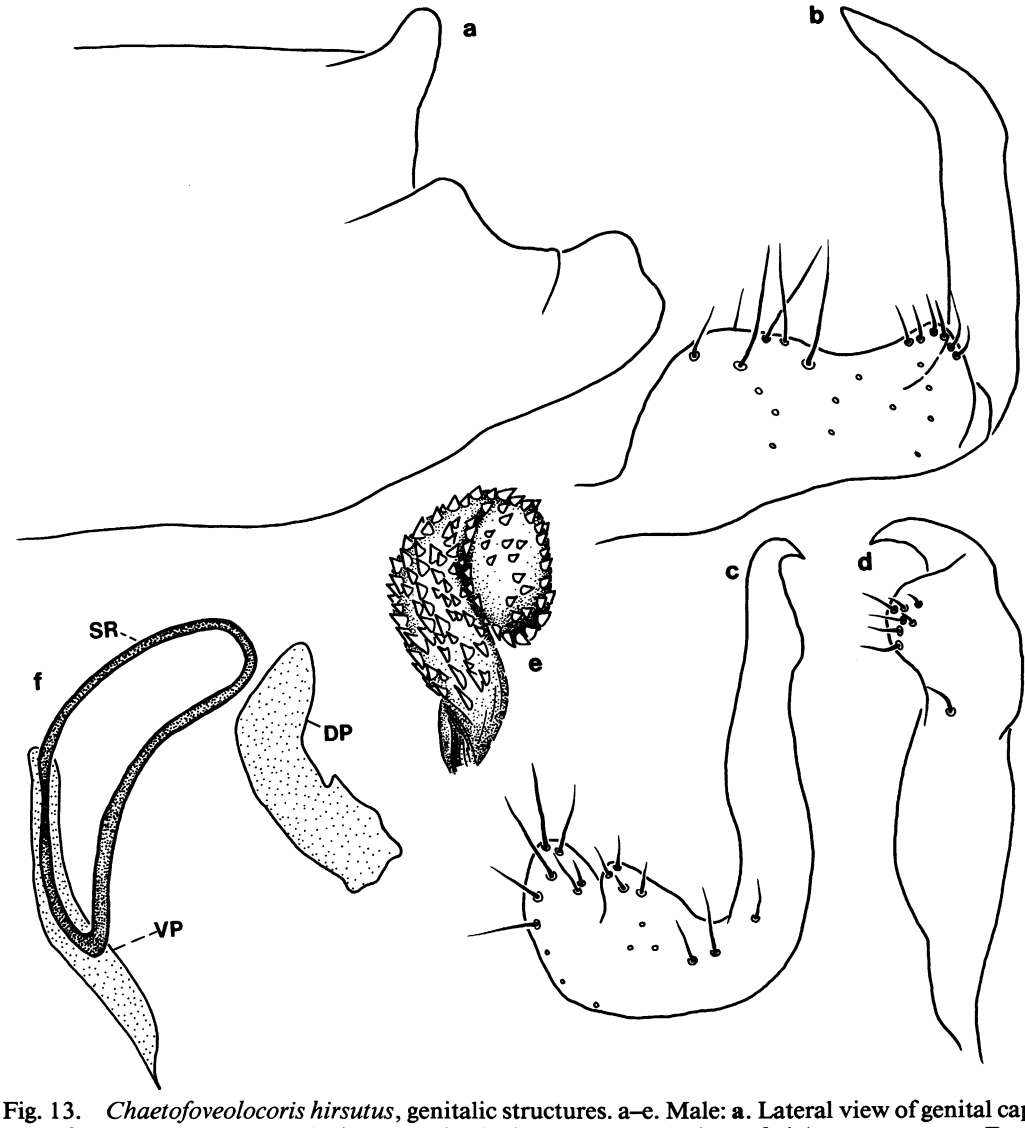

Fig. 13. *Chaetofoveolocoris hirsutus*, genitalic structures. a–e. Male: **a**. Lateral view of genital capsule. b, c. Left paramere. **b**. Lateral view. **c**. Distal view. **d**. Lateral view of right paramere. **e**. Detail of sclerotized patch of vesical membrane. **f**. Female: sclerotized ring (SR); dorsal labiate plate (DP); ventral labiate plate (VP).

slightly carinate, strongest dorsad of coxal cleft; sometimes bilateral vitta diminished on posterior lobe and not reaching posterior margin. **Ventral Aspect:** Testaceous with mesosternum and medial bilateral vitta fuscous. **Legs:** Testaceous, femora with fuscous spots, tarsus and tibia distally fuscous. **Genitalia:** Figures 13a–e. *Genital capsule:* Left tubercle projecting dorsad; posteroventral portion of capsule very slightly indented. *Left paramere:* Large; sensory lobe without distal tubercle; distal flange of shaft long. *Right paramere:* Distal lobe without spinulae; apical hook long and slightly hooked.

Female. Macropterous; shorter then male otherwise similar in coloration and structure. **Measurements:** Total length 8.30–8.85; length from apex of tylus to cuneal fracture 5.80–6.10; width across eyes 0.95–1.01; interocular width 0.53; length from posterior margin of eye to apex of tylus in dorsal view 0.80; labial length 2.10–2.30, reaching metacoxa;

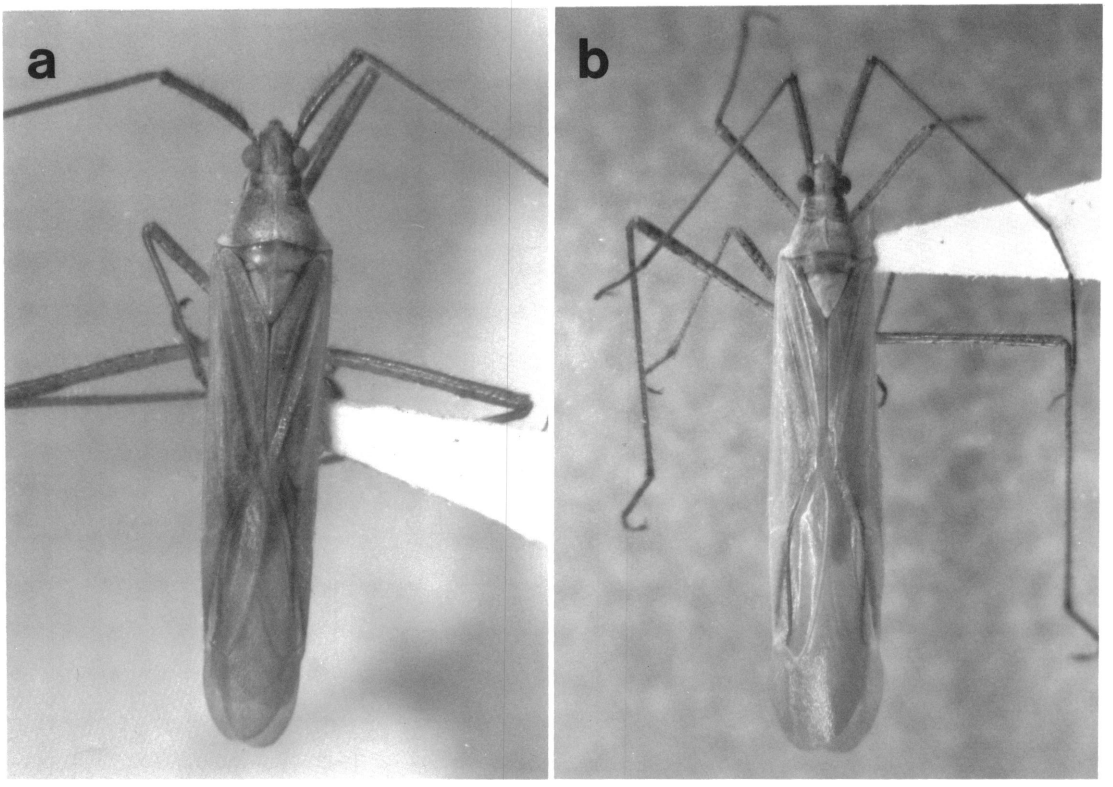

Fig. 14. *Chaetofoveolocoris* species, dorsal habitus of male. **a**. *hirsutus*, Texas, Presido Co. **b**. *parsoni*, Mexico, Chihuahua.

length of antennal segment I 1.45–1.63; II 3.05–3.20; posterior width of pronotum 1.53.

HOSTS: Unknown.

DISTRIBUTION: Figure 15. Coconino Co., Arizona, east to Big Bend National Park, Texas, and south to Nuevo Leon, Mexico.

MATERIAL EXAMINED: 15 specimens from these localities – *MEXICO:* MEXICO, D.F.: Jardin Botanico, 20–26 Oct. 1970 (UNAM). NUEVO LEON: 20 mi W of Linares, 8 Nov. 1946 (CAS). *UNITED STATES:* ARIZONA: **Cochise Co.**: Douglas, 21 Sept. 1959 (USNM); Tex Canyon, Chiricahua Mts., 4500–6000 ft, 1 Oct. 1927 (CAS). **Coconino Co.**: Flagstaff, 24 Sept. 1966 (USNM). TEXAS: **Brewster Co.**: Green Gulch, Big Bend Nat'l. Pk., 11 Oct. 1966 (USNM). **Jeff Davis Co.**: Fort Davis Mts., O.C. Poling (3♂ paratypes, USNM). **Presido Co.**: Marfa, 2 Oct. 1967 (TAM).

DISCUSSION: Knight described *hirsutus* based on several males from Pima Co., Arizona and Jeff Davis Co., Texas. He placed this species in *Megaloceroea* by virtue of the long first antennal segment and impunctate dorsum. Slater (1956) studied the North American species of *Megaloceroea*, diagnosed the genus primarily on structures of the female genitalia, and transferred all the species, but the type, *recticornis* (Geoffroy),

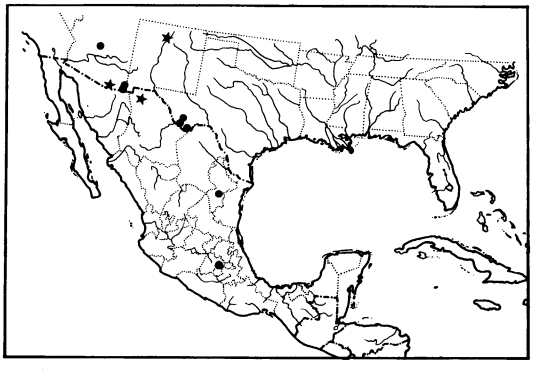

Fig. 15. Distribution of *Chaetofoveolocoris* species. ●, *hirsutus*. ★, *parsoni*.

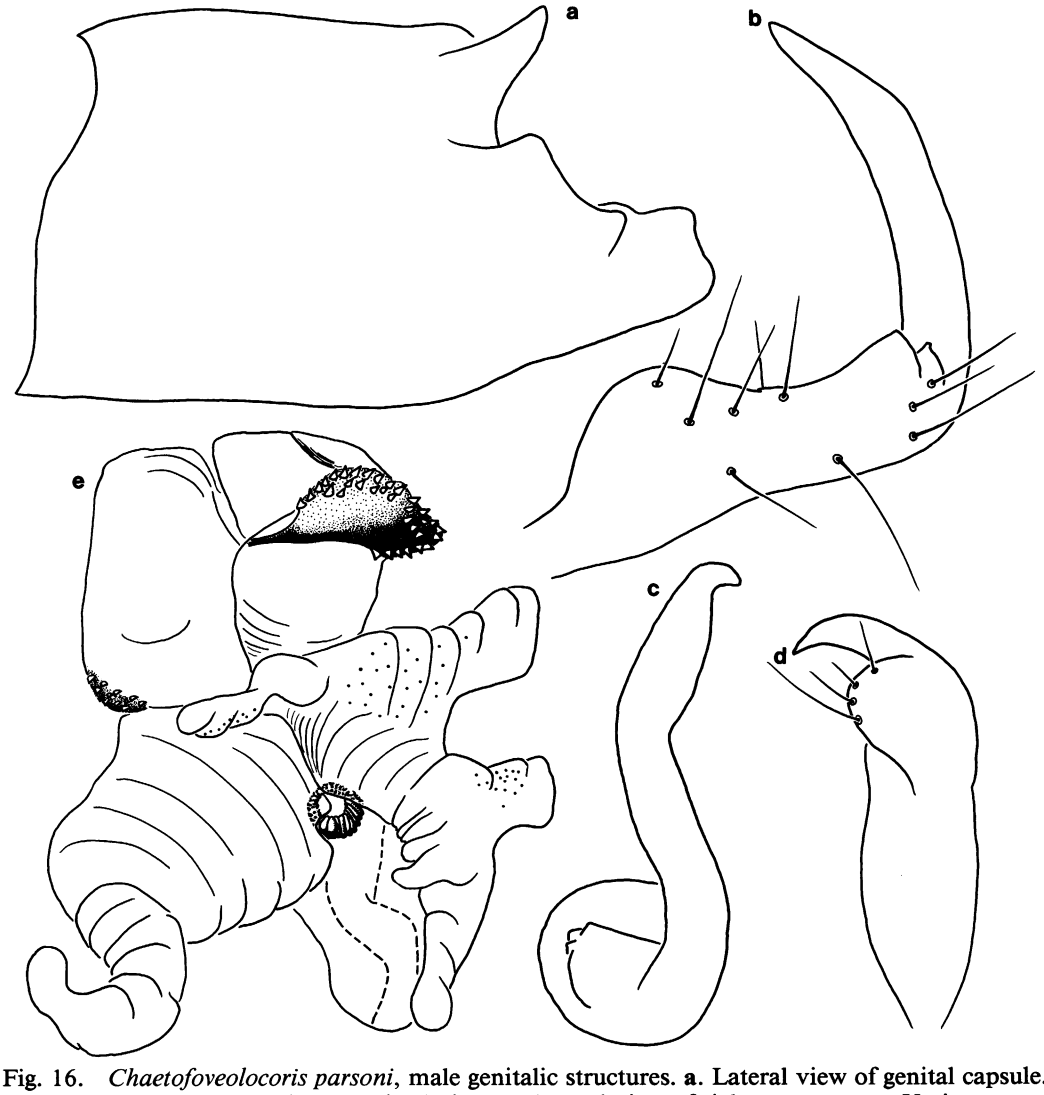

Fig. 16. *Chaetofoveolocoris parsoni*, male genitalic structures. **a**. Lateral view of genital capsule. b, c. Left paramere. **b**. Lateral view. **c**. Distal view. **d**. Lateral view of right paramere. **e**. Vesica.

to his new genus *Litomiris* or to other genera. Slater (1956) placed *Megaloceroea hirsuta* near *Leptopterna* based on possession of impunctate pronotum, long setae on the first antennal segment, and short labium. Knight (1968) established *Chaetofoveolocoris* to contain *hirsutus*, emphasizing the unique fovae on, and interiad of, the calli. Examination of the genitalia of both sexes clearly indicates that *hirsutus* belongs in the *Stenodema* group of genera, and is related to *Stenodema* (Schwartz, 1987).

The paratypes designated in the original description (Knight, 1928), and retained at the National Museum, Washington, D.C., were apparently never labeled. I have affixed paratypes labels to the specimens as indicated by Knight (1928), and listed them under Material Examined.

Chaetofoveolocoris parsoni, new species

Figures 14b, 15, 16a–e

DIAGNOSIS: Distinguished from *hirsutus* by the longer body and antennal segments I and II.

DESCRIPTION: *Male.* **Dorsal Aspect:** Total length 10.60–10.90; length from apex of tylus

to cuneal fracture 6.85–7.10; pale testaceous; head, pronotum, and mesoscutum with obscure infuscate bilaterally (fig. 14b); dorsal surface, antenna, and legs with moderately distributed, long, erect, pale setae. **Head:** Width across eyes 1.02–1.08; interocular width 0.39–0.46; length from posterior margin of eye to apex of tylus in dorsal view 0.80–0.85; eyes large, otherwise head structure and coloration like those of *hirsutus*; labium reaching apex of mesocoxa, length 2.69–2.70; fuscous ventrad, apex piceous; antennal segments III and IV fuscous, length of segment I 2.08–2.15; II 4.50–4.75. **Pronotum:** Posterior width 1.72–1.81; lateral margin slightly carinate, strongest dorsad of coxal cleft, bilateral vitta never reaching posterior margin. **Ventral Aspect:** Pale testaceous with bilateral vitta from genital capsule to posteriad of eye; mesosternum slightly infuscate. **Legs:** Pale testaceous, femora with fuscous spots, tarsus fuscous. **Genitalia:** Figures 16a–e. *Genital capsule:* Left tubercle projecting distad; posteroventral portion of capsule cleft. *Left paramere:* Large; sensory lobe with distal tubercle; distal flange of shaft moderate. *Right paramere:* Distal lobe with spinulae; apical hook moderate and hooked.

Female. Macropterous or sometimes brachypterous with apex of reduced membrane reaching only middle of fourth tergite in dorsal view; differs from male by the more pilose body (especially at base of antennal segment II), and the smaller eyes, otherwise similar in coloration and structure. **Measurements:** *Macropterous:* Total length 10.35; length from apex of tylus to cuneal fracture 7.10; width across eyes 1.08; interocular width 0.53; length from posterior margin of eye to apex of tylus in dorsal view 0.88; labial length 2.90, reaching metacoxa; length of antennal segment I 2.30; II 4.75; posterior width of pronotum 1.74. *Brachypterous:* Total length 10.90; length from apex of tylus to distal end of hemelytra 5.10; width across eyes 1.05; interocular width 0.53; length from posterior margin of eye to apex of tylus in dorsal view 0.90; labial length 3.10; length of antennal segment I 2.20; II 4.70; posterior width of pronotum 1.53.

ETYMOLOGY: Named in honor of Mr. Alberto Parson, who graciously provided transportation and hospitality during my trip to Chihuahua, Mexico, and assisted in collecting the type series.

HOLOTYPE: Male; Mexico, CHIHUAHUA, foothills of Sierra Madre, 15 mi W of Colonia Juarez, 6500–7000 ft, Oct. 2, 1988, M. D. Schwartz and A. Parson, ex: *Muhlenbergia montana* (Nutt.) Hitchc.; deposited in the AMNH.

PARATYPES: 29♂, 10♀, same data as holotype. 1♂, *MEXICO:* CHIHUAHUA: Sierra de la Escondida (Cauplin Mts.), 10 mi NE of Nuevo Casas Grande, 6000 ft, Oct. 3, 1988, M. D. Schwartz (AMNH). *UNITED STATES:* 1♀, ARIZONA: **Cochise Co.:** Huachuca Mountains, "basin," 30 Oct. 1937, Oman (USNM). 2♂, 1♀, NEW MEXICO: **Los Alamos Co.:** Los Alamos, Sept.–Dec. 1976, D. C. Lowrie (USNM).

HOSTS: Collected from *Muhlenbergia montana* (Nutt.) Hitchc.

DISTRIBUTION: Figure 15. From Los Alamos Co., New Mexico, south to northern Chihuahua, Mexico.

LITOMIRIS SLATER

Litomiris Slater, 1956: 118. – Kelton, 1959: 58, figs. 5a–c, 6a–c. – Henry and Wheeler, 1988: 385 (catalog).

TYPE SPECIES: *Miris debilis* Uhler by original designation.

DIAGNOSIS: Distinguished from other *Stenodema* group genera by the mostly smooth and shining dorsal surface with sparse, shallow, or sometimes deep punctures on the pronotum, scutellum, and clavus; and the eyes removed from the pronotum. *Litomiris* is further recognized by the male genitalia with the distal portion of right paramere large and expanded (figs. 18c, 22c, 24c), vesica with one twisted and one straight sclerotized process (figs. 18d, 22d, 24d); and the female genitalia with elongate, narrow sclerotized rings (fig. 18f), and dorsal labiate plate present not forming a ring beneath the genital chamber (fig. 18f).

REDESCRIPTION: **Dorsal Aspect:** Medium to large size, 6.90–9.00; stramineous, usually with piceous or fuscous bilateral vitta on head, pronotum, and scutellum; antennal segment I, usually segments II to IV, and legs fuscous; pronotum with calli smooth, disk with punctures; mesoscutum smooth, scutellum with

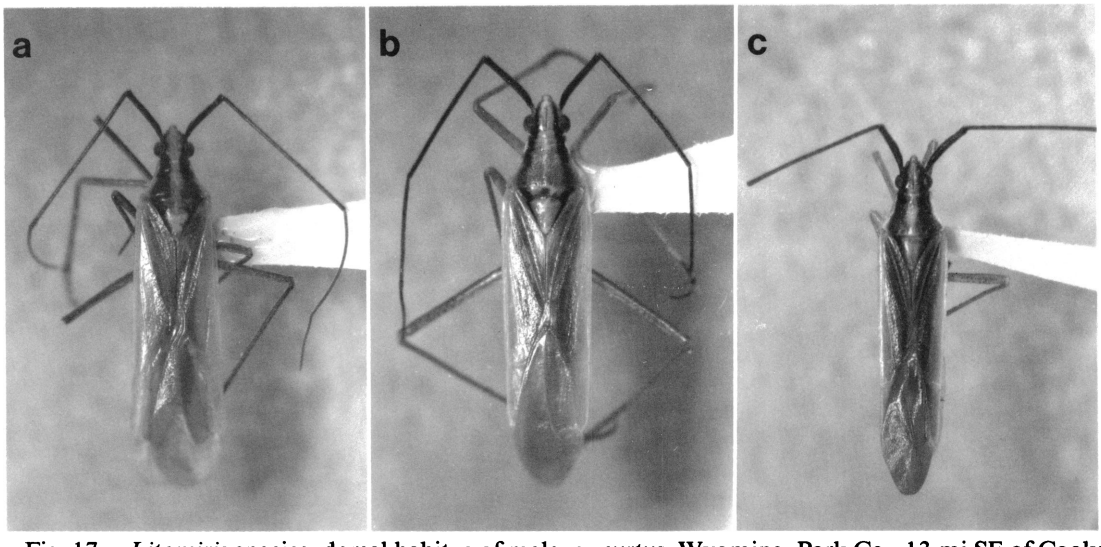

Fig. 17. *Litomiris* species, dorsal habitus of male. **a**. *curtus*, Wyoming, Park Co., 13 mi SE of Cooke City. **b**. *debilis*, Nevada, Elko Co., Ruby Mts. **c**. *gracilis*, California, Ventura Co.

scattered punctures; hemelytra without punctures, and rugulose; clavus with scattered punctures. **Vestiture:** With sparsely to densely distributed, short to long, pale, simple setae; antennal segment I with somewhat stouter setae. **Head:** Triangular in dorsal view, subrectangular in lateral view; eyes large, slightly removed from pronotum; vertex ecarinate; frons rounded in lateral view; apex not strongly produced, projecting slightly anterodorsad of posterior margin of tylus; tylus produced and rounded; labium reaching metacoxae, segment I reaching xyphus. **Antennae:** Segment I with uniform diameter throughout, not bowed. **Pronotum:** Triangular in dorsal view; proepisternum slightly produced and just visible in dorsal view; calli faint, confluent anteriorly, not attaining lateral margins, with pair of foveae medially; collar with faint punctures; pronotum with lateral margin strongly carinate medially, and attaining posterior margin of pronotum, bridged dorsad of coxal cleft; sometimes entire lateral margin slightly explanate. Mesoscutum broadly exposed and merging with scutellum medially. **Hemelytra:** Macropterous, sometimes females submacropterous; with moderately wide embolium, reaching cuneal cleft. **Legs:** Metafemora longer than abdomen, and subequal to metatibiae. **Male Genitalia:** *Genital capsule:* Without tubercles dorsad of paramere insertions; posteroventral portion of capsule slightly produced. *Left paramere:* Without differentiated sensory lobe; surface smooth or with small tubercles; shaft narrow, distal portion gradually narrowed; apex bispinose. *Right paramere:* Distal portion enlarged, strongly protruding ventrad. *Vesica:* Aperture of secondary gonopore with collapsed appearance. Primary sac of membrane with two variously shaped elongate extentions; with two lobal sclerites (one twisted, one straight); usually with small sclerite basad and in front of secondary gonopore. **Female Genitalia:** *Sclerotized rings:* Elongate, narrow, open, with lateral edge curved dorsad. Dorsal labiate plate: Present slightly caudad of rings and spanning genital chamber, without extensive lateral sclerotization. Ventral labiate plate: Present behind lateral one-half of, and not spanning rings. *Posterior wall:* Inter-ramal sclerite: Moderate or narrow with straight ventral margin. Median process: Short, not projecting ventrad of sclerite, extending anteriad into dorsal structure, with plowlike plate posteriorly. Dorsal structure: Small and flat, not saclike. Inter-ramal lobes: Practically adhered to sclerite, angle small.

KEY TO SPECIES OF *LITOMIRIS*

1. Lateral margins of pronotum explanate and upturned (fig. 21c); antennal segment I with stout, bowed appearance, and beset with

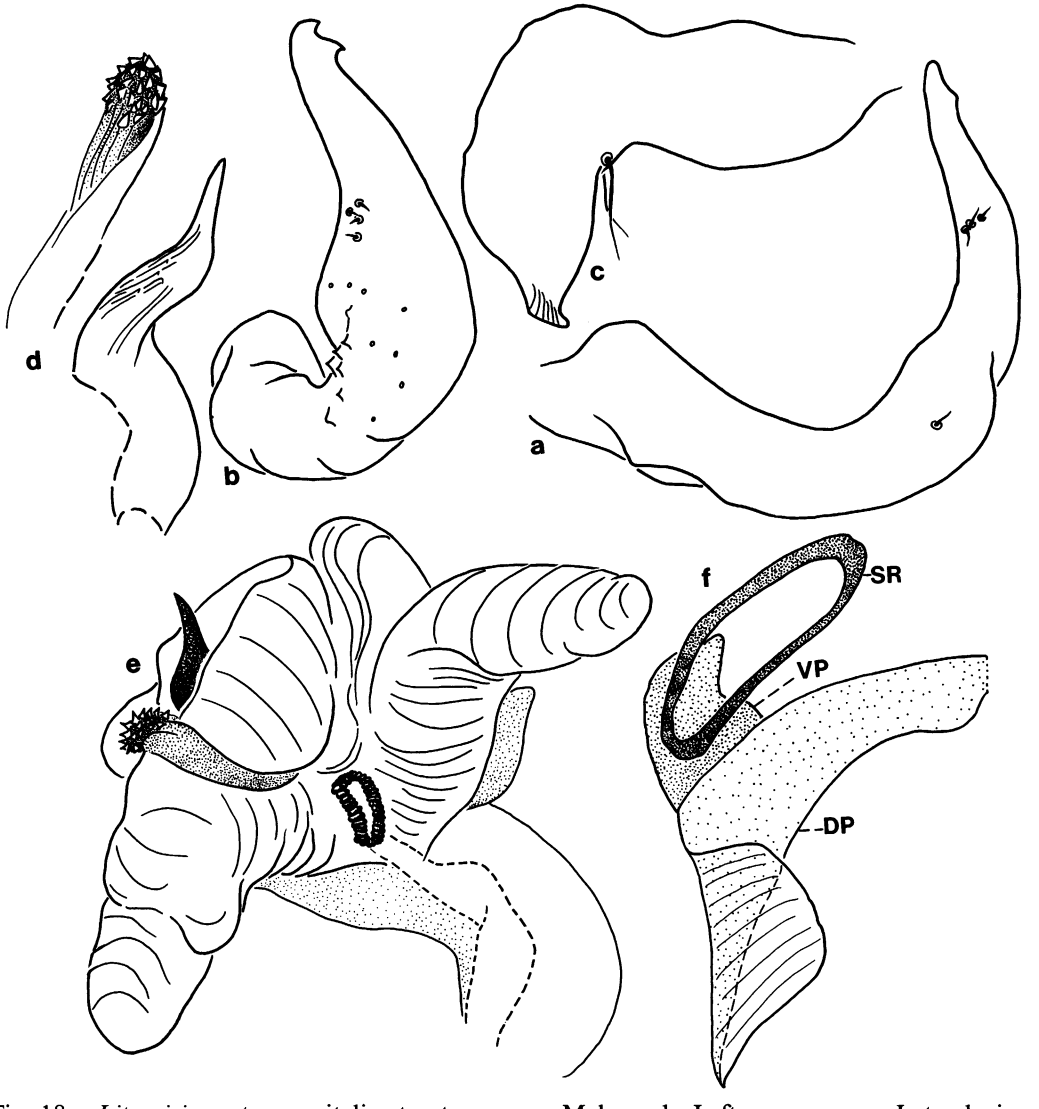

Fig. 18. *Litomiris curtus*, genitalic structures. a–e. Male. a, b. Left paramere. **a**. Lateral view. **b**. Distal view, detail of basal flange. **c**. Lateral view of right paramere. **d**. Lobal sclerites. **e**. Vesica. **f**. Female: sclerotized ring (SR); dorsal labiate plate, (DP); ventral labiate plate (VP).

short, suberect, stout piceous setae; shaft of left paramere without basal flange; distributed in southern California .... *gracilis* (Van Duzee)

–Lateral margins of pronotum carinate, sometimes strongly carinate dorsad of coxal cleft, but never explanate or upturned (figs. 21a, b); antennal segment I with thinner appearance, with less densely distributed longer, appressed to suberect, fine, pale to dark setae; shaft of left paramere sometimes with basal flange; widely distributed 2

2. Basal portion of shaft and interior angle of left paramere with flange; outer surface of angle with tubercles or spinulae (figs. 18a, b; also see description of male genitalia); interocular width of male 0.37–0.43; female submacropterous (membrane small, just surpassing apex of cuneus and shorter than abdomen) (fig. 19); hind wing reduced; distributed in northern Rocky Mountains .... *curtus* (Knight)

–Basal portion of shaft and interior angle of left paramere without flange; outer surface of an-

gle without tubercles or spinulae (figs. 22a, b; also see description of male genitalia); interocular width of male 0.43–0.50; female macropterous (membrane greatly surpassing apex of cuneus, and longer than abdomen); if abdomen surpasses membrane than hind wings fully developed; widely distributed . . . . . *debilis* (Uhler)

Litomiris curtus (Knight)

Figures 6, 17a, 18a–f, 19, 20, 21a

Megaloceroea curta Knight, 1928: 247 (new species). – Carvalho, 1959: 293 (catalog).
Litomiris curta: Slater, 1956: 120 (new combination). – Kelton, 1959: 12, fig. 6a–c (male genitalia).
Litomiris curtus: Knight, 1968: 179 (key, distribution). – Henry and Wheeler, 1988: 385 (catalog).

HOLOTYPE: Male; Yellowstone Nat'l. Pk. Wyo., Aug. 8, 1927, H. H. Knight; HOLOTYPE (By H. H. Knight) *Megaloceroea curta*; deposited in the USNM.

DIAGNOSIS: Recognized unequivocally by the dimorphic sexes, the basal flange on the inner surface of the shaft of the left paramere, and the reduced hind wing of the female.

REDESCRIPTION: *Male.* **Dorsal Aspect:** Total length 7.50–8.80; length from apex of tylus to cuneal fracture 5.10–6.00; testaceous; hemelytra with very pale fuscous suffusion medially; bilateral vitta fuscous to piceous with variable width and length—palest specimens with vitta obscure and restricted to fuscous patches on scutellum, collar, posteriad of eye, base of antennal fossa, and lora—darkest specimens with vitta extending from scutellum to tylus; pronotal vitta usually most intense on anterior lobe and diminished on posterior lobe (fig. 17a); dorsal surface with punctures, strong on pronotum, sometimes few or obsolete on clavus, scutellum, and head. **Head:** Width across eyes 0.88–0.99; interocular width 0.36–0.44; length from posterior margin of eye to apex of tylus in dorsal view 0.73–0.80; dark markings rufus to piceous, ranging from entire lateral portion of head excluding lora and dorsalmost portion of tylus, to diffuse rufus lateral areas and fuscous juga (fig. 21a); labium extending from just surpassing mesocoxae to attaining abdomen; length 2.60–3.00; antenna entirely rufus to piceous; length of segment I 1.28–1.58; II 3.25–4.20. **Pronotum:** Posterior width 1.24–1.60; lateral margin narrowly carinate, vitta only as wide as calli, usually obsolete on posterior lobe (fig. 21a). **Ventral Aspect:** Fuscous, pale dorsally. **Legs:** Rufus to piceous, femora with fuscous spots, tarsus and tibia distally dark. **Genitalia:** Figure 18a–e. *Left paramere:* Outer surface of arm and angle with field of tubercles; inner surface of shaft with flange basally (fig. 18b) *Right paramere:* Distal half ovoid. *Vesica:* Linear lobal sclerite narrow; twisted lobal sclerite small; small basal sclerite posteriad of secondary gonopore diminished or obsolete, with very fine surface texture.

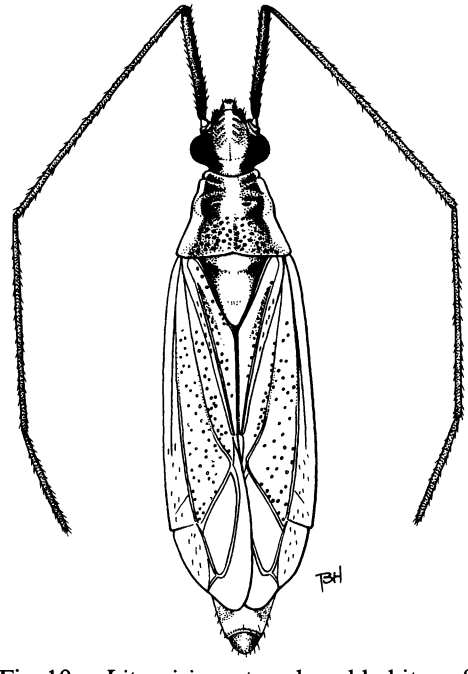

Fig. 19. *Litomiris curtus*, dorsal habitus of female, Oregon, Deschutes Co., Indian Ford Crk.

Female. Submacropterous, hind wing reduced; structure of pronotum narrower than, abdomen more robust than, and coloration similar to, those of male. **Measurements:** Total length (apex of tylus to apex of abdomen) 6.10–7.80; length from apex of tylus to cuneal fracture 4.60–5.70; width across eyes 0.90–1.08; interocular width 0.50–0.60; length from posterior margin of eye to apex of tylus in dorsal view 0.75–0.95; labial length 2.80–3.60; length of antennal segment I 1.20–1.58;

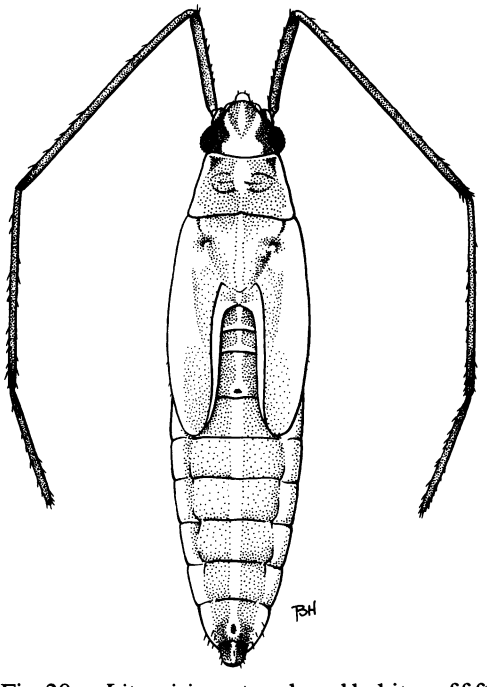

Fig. 20. *Litomiris curtus*, dorsal habitus of fifth instar nymph, locality as in fig. 19.

II 2.80–3.90; posterior width of pronotum 1.29–1.53.

Fifth Instar Nymph. Figure 20. **Coloration of Fresh Specimen:** Legs, antennae, head near eyes, and caudal segments of abdomen bright reddish, antennal segments III and IV distally darker reddish; dorsal and ventral aspects pale greenish, with margins, medial vitta, and wing pads paler.

HOSTS: *Elymus triticodes* and *Sitanion hystrix*.

DISTRIBUTION: Figure 6. Northern Rocky Mountains from southern British Columbia, southeast to Teton Co., Wyoming, and southwest to the Wallowa and central mountain regions of Oregon.

MATERIAL EXAMINED: 201 specimens from these localities – *CANADA:* BRITISH COLUMBIA: Aspen Grove, 10 July 1975; Chopaka, 1 Aug. 1921; Cranbrook, 23 July 1959; Dog Lk., 15 June 1919; 10 mi E of Falkland, 1 July 1959; 9 mi E of Grand Forks, 8 June 1959; Jaffray, 17 July 1974; Kamloops, Paul Lk., 29 June 1950. Oliver: 29 June 1959; White Lk., 29 June 1959; Sawmill Lks., 30 June 1959; Vaseaux Lk., 29 May 1959. Osoyoos, Anarchist Mt., 5 July 1959 & Richter Pass, 6 June 1959; Princeton, 19 Aug. 1959; Rock Crk., 7 June 1959 (CNC); Vernon, 16 June 1917 (USNM), 13 June 1934 (CNC); Westbank, 15 June 1955. *UNITED STATES:* IDAHO: **Franklin Co.:** Dayton, 4747 ft, 10 July 1937 (USNM). **Latah Co.:** Genesee, 21 June 1936 (AMNH, CNC, USNM). **Lemhi Co.:** Salmon, Idaho Expt. Sta., 2949 ft, 9 July 1928 (USNM). **Nez Perce.:** Lenore, 1000 ft, 19 May 1937 (OSU). **Valley Co.:** McCall, 22 June 1926 (1♀ paratype, USNM). MONTANA: **Gallatian Co.:** Beaver Crk., 6300 ft, Aug. 1913 (USNM); Beaver Crk., 6500 ft, 23 mi NNW of West Yellowstone, 24 July 1978 (AMNH); 55 mi S of Bozeman, 6800 ft, 11 July 1973 (OSU); 5500 ft, 18 July 1913 (1♀ paratype, USNM). OREGON: **Deschutes Co.:** Indian Ford Crk., 6 mi W of Sisters, 19 July 1963 (OSU). Indian Ford Rd., 2 mi NE of Sisters, T14S R10E Sec 27, 10 June 1979, ex. *Sitanion hystrix*, *Elymus triticodes* (AMNH); 14 mi S of Millican, 5400 ft, 21 July 1979 (AMNH); Paulina Crk., 10 mi ENE of Lapine, 6 Aug. 1958 (OSU). **Jefferson Co.:** Allen Sprg., Metolius R., 27 July 1960 (OSU). **Grant Co.:** 13 mi S of Dale, 3400 ft, 17 June 1973 (OSU). **Union Co.:** 4 mi NW of Elgin, 6 July 1956 (OSU); 37 mi NE of Ukiah on Rt. 244, 3200 ft, 18 June 1979, ex. *Elymus* (AMNH). **Wheeler Co.:** 4 mi SW of Fossil, 5 June 1979 (OSU); 17 mi E of Mitchell, 29–30 June 1967 (AMNH). **Wallowa Co.:** Chief Joseph Mt., Joseph, 4 July 1950 (AMNH); 8 mi N of Imnaha, 2 July 1969 (OSDA); Joseph, 13 June 1973 (OSU); Lone Sprg., 32 mi N of Joseph, 19 June 1969 (OSDA). WASHINGTON: **Douglas Co.:** Foster Coulee, Grand Coulee, 24 June 1902 (USNM). **Okanogan Co.:** Sweat Crk., 8 mi WNW of Republic (Ferry Co.), 3600 ft, 20 June 1978 (AMNH). **Spokane Co.:** Spokane, 10 June 1960 (LACM). **Whitman Co.:** 4 mi N of Central Ferry, 1 July 1975 (UCB); Pullman, 10 June 1911, 12 June 1920, & 24 June 1902 (USNM). **Yakima Co.:** Donald, 12 July 1936 (USNM). **County ?:** E[astern]. Was[hington]. (USNM). Pressy's, Wenass Valley, 7 July 1882 (USNM). Preston's, Klikitat Valley, 11 July 1882 (USNM). WYOMING: **Teton Co.:** Grand Teton Nat'l. Pk., Jackson Lk. Village, 23 July 1971 (USNM). **Park Co.:** Lake Crk. Camp, 13 mi SE of Cooke City, 7200 ft, 21–26 July 1962

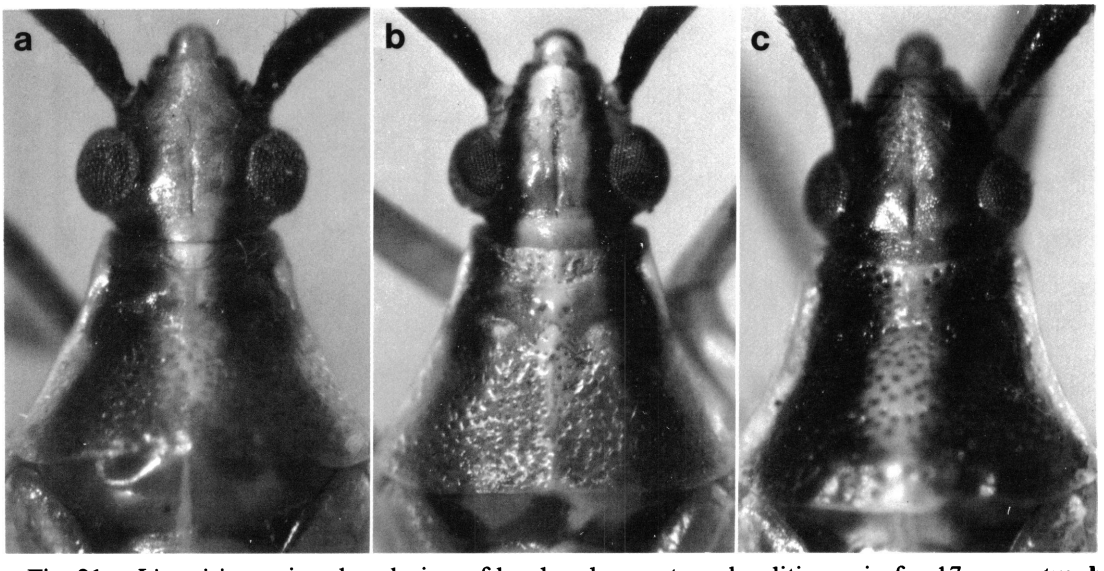

Fig. 21. *Litomiris* species, dorsal view of head and pronotum, localities as in fig. 17. **a**. *curtus*. **b**. *debilis*. **c**. *gracilis*.

(USNM). Yellowstone Nat'l. Pk.: 8 Aug. 1927 (3♂, 16♀ paratypes, USNM); 19 July 1945, bunch grass–sage (USNM); 20 July 1925 (USNM).

DISCUSSION: This species was described by Knight (1928) based on material swept from roadside grasses growing on a treeless plateau near Mammoth Hot Springs, Yellowstone National Park, Wyoming. Many of the specimens designated paratypes in the original description, and retained at the National Museum, Washington, D.C., where not labeled as such. I have affixed paratype labels to the specimens indicated by Knight (1928).

The distribution of *curtus* is similar to the distribution of three species of the grass feeding mirine genus *Irbisia* described by Knight (1928). *Irbisia elongata*, *I. fuscipubescens*, and *I. nigripes* all occur in the northern Rockies, and along with *curtus* and other mirids (e.g., *Phytocoris*; Stonedahl, personal commun.) may represent an endemic faunal element.

Litomiris debilis (Uhler)

Figures 17b, 21b, 22a–d, 23

Miris debilis Uhler, 1871: 471 (list, name not available).

Megaloceroea debilis Uhler, 1872: 403 (new species). – Reuter, 1909: 5 (description, in part). – Van Duzee, 1916: 36 (checklist); 1917, 305 (catalog). – Carvalho, 1959: 293 (catalog).

Litomiris debilis: Slater, 1956: 120 (new combination). – Kelton, 1959: 12, fig. 5a–c (male genitalia). – Knight, 1968: 179 (key, distribution). – Kelton, 1980: 29, fig. 22 (dorsal habitus, distribution). – Stevens, 1982: 56 (description, hosts). – Henry and Wheeler, 1988: 385 (catalog).

Litomiris tritavus Bliven, 1973: 135 (new species). – Henry and Wheeler, 1988: 385 (catalog). NEW SYNONYM.

LECTOTYPE: Male; Weld Co., Col. [handwritten]; PR Uhler; *Megaloceroea debilis* Uhler, det. M. D. Schwartz, 1988; deposited in the USNM.

LECTOTYPE OF SYNONYM: Male; U.S.A: CALIFORNIA: Humboldt County, Blocksburg, 17.VI.1951, Brunson P. Bliven; BRUNSON P. BLIVEN COLLECTION, 1981 Accession CALIF. ACAD. OF SCI.; LECTOTYPE *Litomiris tritavus* Bliven 1973, det: M. D. Schwartz 1988.

DIAGNOSIS: Distinguished from the other *Litomiris* species by these attributes: left paramere of male without basal flange, tubercles, or spinulae; macropterous hemelytra and fully developed hind wing of female; and only carinate, but not explanate, lateral margin of pronotum.

REDESCRIPTION: *Male.* **Dorsal Aspect:** Total length 6.90–9.00; length from apex of tylus to cuneal fracture 4.80–6.30; testaceous;

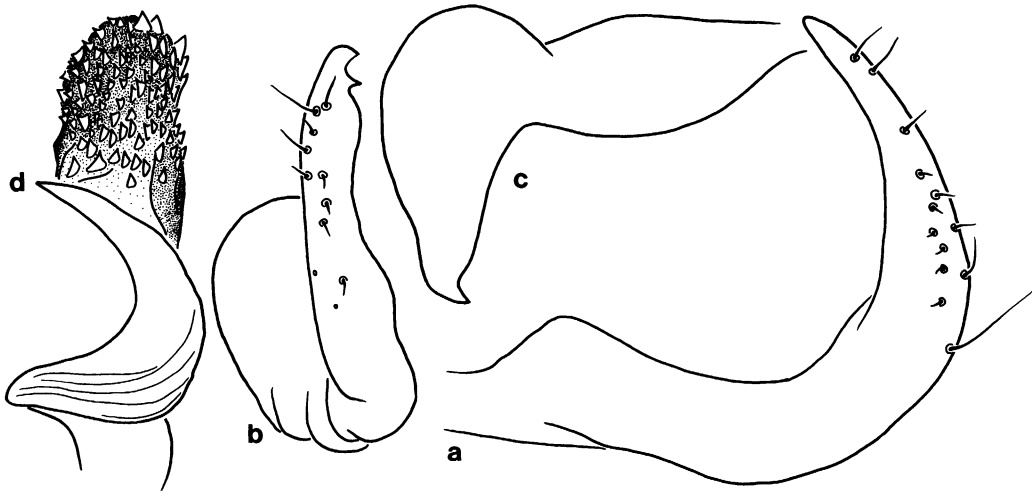

Fig. 22. *Litomiris debilis*, male genitalic structures. a, b. Left paramere. **a**. Lateral view. **b**. Distal view. **c**. Lateral view of right paramere. **d**. Lobal sclerites (linear behind twisted).

sometimes hemelytra with pale fuscous suffusion medially; bilateral vitta fuscous to piceous with variable width and length as in *curtus*, but usually narrower and with these exceptions: alest specimens with fuscous patch on tylus basally and base of antennal fossa with rufus vitta laterally; darkest specimens with vitta on base of antennal fossa interrupted medially by pale area, sometimes medial pale area obsolete, then vitta piceous with distinct border throughout and spanning width of calli (fig. 17b); dorsal surface with deep punctures on pronotum, otherwise punctures few or obsolete. **Head:** Width across eyes 0.83–1.08; interocular width 0.39–0.50; length from posterior margin of eye to apex of tylus in dorsal view 0.80–0.85; dark markings as in *curtus* except margins of vitta distinct and base of antennal fossa not entirely darkened, usually with pale area medially (fig. 21b); labium extending from mesocoxae to base of abdomen; length 2.70–3.20; antenna rufus to piceous, usually dorsal and/or lateral portion paler; length of segment I 1.18–1.44; II 2.75–3.60. **Pronotum:** Posterior width 1.28–1.78; lateral margin narrowly carinate; vitta usually confined to lateral margin of calli and narrowly reaching posterior margin of pronotum; sometimes vitta diminished on posterior lobe (fig. 21b). **Ventral Aspect:** Pale with dark medial vitta and sometimes mesosternum extensively darkened. **Legs:** More conspicuously spotted than in *curtus*, tarsus and tibia distally dark. **Genitalia:** Figures 22a–d. *Left paramere:* Outer surface of arm and angle smooth; inner surface of shaft without flange basally; general size, especially length and diameter of shaft, variable. *Right paramere:* Distal half ovoid. *Vesica:* Linear lobal sclerite wide, truncate apically; twisted lobal sclerite large; small basal sclerite posteriad of secondary gonopore well developed.

Female. Macropterous; similar to male in coloration and structure but differs in these aspects: slightly more robust, and antennal segment I sometimes with interior portion pale. **Measurements:** Total length 7.00–9.40; length from apex of tylus to cuneal fracture 5.00–6.60; width across eyes 0.98–1.08; interocular width 0.43–0.56; length from posterior margin of eye to apex of tylus in dorsal view 0.85–1.03; labial length 2.90–3.90, reaching from metacoxae to abdomen; length of antennal segment I 1.15–1.68; II 2.90–4.00; posterior width of pronotum 1.36–1.83.

HOSTS: *Agropyron cristatum*; *A. dasystachym*, *A. intermedium*, *A. trachycaulum*, *Deschampsia caespitosa*, *Leucopoa kingii*, *Phleum pratense*, *Stipa comata* var. *intermedia* (Stevens, 1982).

DISTRIBUTION: Figure 23. Widespread, from Coastal Alaska, south to San Diego Co., California, east to Ontario, Canada; with apparently a disjunct population in Terra Nova National Park, New Foundland, Canada.

MATERIAL EXAMINED: 1434 specimens,

collected from May 4 to Sept. 7 from these localities – *CANADA:* ALBERTA: Aden, Gilchrist Ranch, swept from alfalfa/crested wheat grass; Banff Nat'l. Pk., Eisenhower Jct., 4700 ft; Coronation; Dixsonville; Drumheller; Elkwater Park; Empress; Grimshaw; Irvine (CNC); Jasper, 1040–1060 m (AMNH); Kananaskis Hwy.; Lethbridge; Manyberries, Pakouki Lk.; McMurray; Medicine Hat; Milk River; Morrin (CNC); Nemiscam (CAS, CNC, USNM); Nordegg (CNC, USNM); North Star; Onefour; Peace River; Scandia, swept from range grasses; Stettler; Waterton Pk. (CNC). BRITISH COLUMBIA: Aspen Grove; Christina Lk.; Elko; Kamloops, Tranquille; Kelowna; Lillooet, Seton Lk.; Lockhart Beach; Moyie; Oliver, White Lk.; Rolla; Soda Crk. (CNC); Skihist Cmpgrd., Fraser R. (UCD); Vernon (CAS); Victoria (CNC). MANITOBA: Aweme, N of Criddle; 6 mi NW of Brandon; Carberry; Falcon Lk.; Faloma; Horton; Melita; Millwood; Pilot Mound; Riding Mt. Nat'l. Pk.; 10 mi W of Roblin (CNC); Rosenfeld (OSU); Russell (CNC); 5 mi SW of Shilo (CNC); The Pas (USNM); Treesbank (CNC); Virden (CNC). NEWFOUNDLAND: Terra Nova Nat'l. Pk. (CNC). NORTHWEST TERRITORIES: Fort Simpson; Fort Smith; Yellowknife (CNC). ONTARIO: Finland; Fort Frances; Midland; Rainy River; Sault Ste. Marie; Sioux Narrows (CNC). SASKATCHEWAN: Assiniboia; Battleford; Bestville; Big River; Broadview; Buffalo Pound; Codette; Cut Knife, Atton Lk.; Elbow; Emma Lk.; Good Spirit Lk.; Kandahar; Killdeer; Lumsden; Mc Gee; Preeceville; Rock Glen; Roadene; Rutland; Saskatchewan Landing; Saskatoon; Torch River; Willow Bunch; Willows; Zealandia (CNC). QUEBEC: Ville Marie. YUKON: Carmacks; Dawson; 14 mi E of Dawson, 1300 ft; Jct. of Demp and Klond Hwy.; Moose Crk; Tatchun; Von Wilczek (CNC). *UNITED STATES:* ALASKA: Copper Center; Healy; Lower Tonsina (USNM). ARIZONA: **Santa Cruz Co.:** Nogales, July 31 (UCD). CALIFORNIA: **Alameda Co.:** Tes[?] Rd. (CAS). **Butte Co.:** Jarbo Pass (UCB). **Calaveras Co.:** Mokelumne Hill (UCB). **El Dorado Co.:** Greenwood (UCB); Pilot Crk. (UCB). **Humboldt Co.:** Bair's Rch., Redwood Crk. (USNM); Blocksburg: 4 July 1948 (1♀, paralectotype of *tritavus*, CAS); 17 June 1951 (1♀, paralectotype of *tritavus*, CAS); Bridgeville (CNC); Dinsmores, nr. Cobbs, 28 June 1942 (1♂, 2♀, paralectotypes of *tritavus*, CAS); 5 mi E of Kneeland (UCB); 15 mi W of Laytonville (UCB). **Kern Co.:** Poso Crk. (CAS). **Lake Co.:** Blue Lakes (UCD); Clear Lk. (UCB). **Lassen Co.:** Hallelujah Jct. (UCD); Ravendale (UCB); Susanville (CNC). **Los Angeles Co.:** Pasadena (USNM); Tanbark Flat (UCB). **Madera Co.:** Bass Lk. (UCB). **Mendocino Co.:** 3 mi N of Branscomb (UCB); Cummings (CAS); 2.5 mi N of, 7 mi W of, & Eel R. Rgr. Sta. (UCB); Ham Pass, 4 mi N of Eel R. Rgr. Sta., 4400 ft; 15 mi W of Laytonville (UCB). **Modoc Co.:** Alturas (CAFA); 8 mi NW of Alturas (UCD); Buck Crk. Rgr. Sta. (UCB); 24.7 mi NW of Canby, 1375 m (AMNH); Upper Rush Cmpgrd., 8 km NE Adin, 4800 ft (UCB); 20 mi NE of Tule Lk. (AMNH); 3 mi E of Willow Ranch (UCB). **Mono Co.:** Sonora Bridge, nr. Sonora Jct. (CAS); Topaz (USNM). **Monterey Co.:** Arroyo Seco Cmpgrd. (UCD); Bradley (CAS); Jolon (UCD). **Napa Co.:** Shell Valley, Stage Coach Cyn. Rd. at Spanish Valley Trail (CAS). **Nevada Co.:** 3 mi N, & Boca (UCD); Hobart Hills (UCD); Sagehen Crk. Sta. (UCD); 17 mi N of Truckee (UCD). **Orange Co.:** Laguna Mts. (KU). **Plumas Co.:** Caribou (UCB); Clio (AMNH); 4 mi W of Quincy (LACM, UCD); Quincy (CAS). **Riverside Co.:** Herkey Crk., San Jacinto Mts. (CAS); Idyllwild (AMNH, LACM); Keen Cmpgrd., San Jacinto Mts. (AMNH); 2 mi N of Mountain Center (UCR); Palm Cyn. (UCR). **San Bernardino Co.:** San Bernardino Mts.: Arrowhead Lk (UCB); nr. Crestlin (UCR); Cmpgrd. O-ongo nr. Running Sprgs., 6300 ft (LACM). **San Diego Co.:** Cuyamaca St. Pk. (AMNH); Doane Valey, Palomar Mts. (UCR); Laguna Mt., Resorts (CAFA, OSU, UCB, UCD); Wm. Heise Co. Pk., 3 mi S of Julian (UCR); Mt. Palomar (UCD). **San Luis Obispo Co.:** Mts. W of La Penza (UCB). **Santa Clara Co.:** Mt. Hamilton (UCB). **Santa Cruz Co.:** Santa Cruz (UCB). **Shasta Co.:** Burney (BYU); Cassel (UCD); Hat Crk., 10 mi N of Old Sta. (CAS, CNC, UCD); Lk. Britton (UCB); Old Station (UCD). **Sierra Co.:** Sattley (CAFA, UCD); Sierra Valley (UCD); Sierraville (OSU, UCD); South Mill (UCD): Yuba Pass (LACM). **Siskiyou Co.:** Happy Camp (CAS); Hornbrook (CNC); Hutton Forest Cmp. (OSU); 4 mi NW of Lava Beds

Nat'l. Mon. Hq., 4200 ft (AMNH); 5 mi S of Macdoel (AMNH); McBride Sprg., 4 mi NE of Mt. Shasta (UCB); Walker (CAS); north of Weed (USNM); Young's Valley (OSU). **Sonoma Co.:** (CAS). **Stanislaus Co.:** Del Puerto Cyn. (UCD). **Tehema Co.:** 10 mi W of Mineral (UCB). **Trinity Co.:** Carrville (CAS, LACM); 10 mi SW of Hayfork, 3500 ft (OSU); Hayfork, 2300 ft (UCB); Helena (CNC). **Tuolumne Co.:** Coffee Crk., Big Flat (CAS); nr. Mather (UCB); 6 mi NE of Sonora (OSU); Twain Harte (UCB). COLORADO: **Archuleta Co.:** 5 mi N of Pagosa Sprgs. on Rt. 160 (AMNH). **Boulder Co.:** Boulder (CNC, USNM); Nederland (KU); Science Lodge, 9000 ft, Nederland (CNC); Valmont Butte, 5300 ft, Boulder (CNC). **Chaffee Co.:** Buena Vista, 7600 ft (CNC). **Custer Co.:** 10 mi SW of Wetmore (USNM). **Clear Creek Co.:** Mt. Evans: Doolittle Ranch, 9800 ft; Echo Lk., 10,600 ft; Summit Lk., 12,800 ft; Timberline, 11,600 ft; West Chicago Crk. Cmpgrd., Arapaho Nat'l. For., 9800 ft (CNC) **Dolores Co.:** Cottonwood Sprg., 21 mi NE of Dolores, 7800 ft (AMNH); West Dolores R., 19 mi NE of Dolores, 7600 ft (AMNH). **Eagle Co.:** State Bridge, 7000 ft (CNC). Wolcott, 6975 ft (USNM). **El Paso Co.:** Colorado Sprgs. (AMNH). **Grand Co.:** Berthoud Pass [handwritten], PR Uhler (1♂ paralectotype, USNM); Williams Fork Reservoir on Rt. 40 (CAS). **Gunnison Co.:** Beaver Crk. Jct. (USNM); Dry Gulch, Gunnison R. (USNM); Gothic (AMNH); Waunita Hot Sprgs., N of Doyleville (CAS). **Jackson Co.:** Clear Crk., 14 mi W of Buffalo (KU). **Jefferson Co.:** Indian Hills, 7000 ft (AMNH). **La Plata Co.:** Durango (CAS). **Larimar Co.:** Estes Pk. (CAS); Ft. Collins (USNM); Pingree Park (USNM); Rocky Mt. Nat'l. Pk., Moraine Valley, 8000 ft (AMNH). **Mineral Co.:** Creede, 8844 ft (KU, USNM). **Moffat Co.:** Maybell (KU). **Montezuma Co.:** Mesa Verde Nat'l. Pk. (UCB). **Routt Co.:** 5 mi NW of McCoy (USNM); Steamboat Sprgs., 7000 ft (USNM). **Summit Co.:** S end of Green Mt. Rsvr. (UCB). **Teller Co.:** Big Sprgs. Ranch, Florissant (LACM); Florissant (AMNH); Florissant, Petrified Forest Area (CAS); S base of Blue Mt., nr. Florissant, 8426 ft (LACM); 7 mi NW Woodland Park on Rt 67, 8000 ft, Manitou For. Picnic Area (AMNH). **Weld Co.:** Weld Co. [handwritten], PR Uhler (1 specimen [sex ?] paralectotype, USNM). **County ?:** S. Col. [handwritten], PR Uhler (1♀ paralectotype, USNM). N. E. Col. [handwritten], PR Uhler (1♀ paralectotype, USNM). Little Beaver (USNM). Colo. 1692 & 2033 (USNM). Gold Hill (KU). Mill Gulch (AMNH). Clark (CAS). IDAHO: **Bannock Co.:** Lava Hot Sprgs. (BYU); Pocatello (USNM). **Bear Lake Co.:** St. Charles (USU). **Blaine Co.:** Little Wood R., 6 mi NW of Carey (UCB). **Bonneville Co.:** 7 mi SE of Irwin, 5500 ft (OSU). **Butte Co.:** Bear Pass Crk. (UCD). **Camas Co.:** Fairfield (OSU, USNM). **Caribou Co.:** Henry (AMNH); Henrys Lk. (USNM). **Cassia Co.:** Strevell (OSU). **Clark Co.:** Dubois (OSU). **Franklin Co.:** Cub River Cyn. (OSU, UCD, USU); Franklin (OSU); Lewiston (USNM). **Fremont Co.:** 3.8 mi N of Ashton, 5500 ft (OSU); Reynolds Pass (OSU); St. Anthony, 4965 ft (LSU). **Lincoln Co.:** Shoshone (OSU, USU). **Oneida Co.:** Black Pine Cyn.; Rock Crk. (OSU); Twin Sprgs. (UCD). **Twin Falls Co.:** Hollister; Milner (USNM). **County ?:** Wheatland (UCB). IOWA: **Palo Alto Co.:** 5 mi NW of Ruthven (AMNH, USNM). **Lyon Co.:** Little Rock, 2 July 1897 (UAZ). **Story Co.:** Ames (AMNH, USNM). **Winneshiek Co.:** Decorah (AMNH). MICHIGAN: **Alger Co.:** Au Train (CNC). **Cheboygan Co.:** Univ. of Mich. Biol. Sta., Douglas Lk. (OSU, UM). **Clare Co.:** Tobacco Rd. (AMNH). **Delta Co.:** (USNM). **Emmet Co.:** Maple R., 2 mi S of Pellston (KU). **Kalkaska Co.:** (USNM). **Gratiot Co.:** 2 mi E of Ola (UCB). **Otsego Co.:** Vanderbilt (USNM). MINNESOTA: **Crow Wing Co.:** 12 mi S of Cross Lk. (UCB); 5 mi SE of Pequot Lakes (USNM). **Hubbard Co.:** 2 mi W of Nevis (UCB). **Marshall Co.:** Middle River (KU). **Ottertail Co.:** Rush Lk., 7 mi S Perham (UCB). **Ramsey Co.:** New Brighton (USNM); St. Paul (AMNH). **St. Louis Co.:** Duluth, Park Pt. (AMNH). **Trasverse Co.:** Lk. Traverse, 6 mi NE of Browns Valley (UCB). MONTANA: **Carbon Co.:** East Rosebud Lk., 6200 ft (AMNH). **Gallitan Co.:** Bozeman (TAM, USNM); Willow Crk. (CAS, CNC, TAM, UAZ, UCB). **Glacier Co.:** Babb (CNC); Glacier Nat'l. Pk., Medicine Lk. (AMNH); Glacier Pk. Sta. (USNM). **Jefferson Co.:** Butte (AMNH). **Lewis and Clark Co.:** Helena (USNM). **Park Co.:** Eagle Crk. Rd., 3 mi N & E of Gardiner (CAS). **Roosevelt Co.:** Pop-

ular (USNM). **Sweet Grass Co:** Crazy Mts., Halfmoon Pk., 6500 ft (CU). Big Timber (USNM). **Wheatland Co.:** Harlowton (AMNH). **County ?:** Turtle Mt. [handwritten], PR Uhler (1♀ paralectotype, USNM). NEBRASKA: **Cherry Co.:** Crookston (CNC); Valentine (AMNH). **Antelope Co.:** Royal (CNC). **Sheridan Co.:** Hay Springs (CNC). NEVADA: **Elko Co.:** Carlin (KU); 16 mi SE of Elko on Rt. 227, 5600 ft (AMNH); 2 mi W of Harrison Pass Sum. (UCD); Ruby Mts., Lomoilie Cyn., just E of Powerhouse Picinic Area, 6200 ft (AMNH); Ruby Mts., 5 mi SE of Secret Pass (UCB); Ruby Lk. Nat'l. Wldlf. Rfg., Cmpgrd, 6100 ft (AMNH). **Humboldt Co.:** Charles Sheldon Antelope Refuge (USNM). **Lyon Co.:** Carson City (CAS). **Ormsby Co.:** (CAS, USNM). **Washoe Co.:** Verdi (LACM, UCB, UCD, UCR, USU). **County ?:** Nev. (USNM). NEBRASKA: **Dawes Co.:** 10 mi E of Chadron (OSU). **Cherry Co.:** Merriman (OSU). NEW MEXICO: **Rio Arriba Co.:** Chama (KU). **North Dakota: Burleigh Co.:** Bismarck (USNM). **Cass Co.:** (USNM). **Stark Co.:** 3 mi NW of Dickinson (UCB). OREGON: **Baker Co.:** Baker (OSU). **Benton Co.:** Corvallis (CNC, OSU, USNM). **Crook Co.:** Ochoco Pass (UCD); Ochoco Reservoir, 8 & 25 mi E of Prineville; 22 mi E of Prineville, 3600 ft (OSU). **Deschutes Co.:** 29 mi E of Bend, Horse Rdg. Smt., 4300 ft (OSU); 6 mi N of Lapine (OSU); ½ mi, 1 mi, & 2.2 mi S of Millican, on Pine Mt. Rd. (OSU); 14 mi S of Millican, T20S R15E Sec34, 5400 ft (AMNH); 13 mi S of Sisters (OSU). **Douglas Co.:** 12 mi S of Tiller, 720 m (AMNH). **Grant Co.:** 13 mi S Dale, 3400 ft (OSU); Izee, Keerin's Rch. (AMNH); Seneca (AMNH). **Harney Co.:** Burns (KU); 15 mi W of Burns on OR St. Rd. 20, rest stop (AMNH); Frenchglen (CAS); Squaw Butte Expt. Sta. Hq., 35 mi W of Burns (OSU); T36S R35E Sec8 SE (OSU). **Hood River Co.:** Cloud Cap (AMNH); Hood River (CAS). **Jackson Co.:** Mt. Ashland (OSU); Glade Crk. (OSU); Laurelhurst St. Pk. (UCB); ½ & 1 mi E of Pinehurst (AMNH & OSU); Sam's Valley (OSU); Siskiyou (CNC); Siskiyou Pass; 8 mi S Siskyou Summit on Old Hwy., 4300 ft (OSU); Squaw Lks. (OSU). **Josephine Co.:** 5 mi SW of Cave Jct., 1400 ft (OSU); 12 mi N of Cave Jct. (AMNH); 1 mi S of Rough and Ready Hwy. Wayside (AMNH); 2.8 mi S of Selma (AMNH); 4 mi W of Selma, 1164 ft, Illinois R., T38S R8W Sec8 (OSU). **Klamath Co.:** 7 mi NW of Beatty (OSU); Big Squaw Flat, 18 mi SE of Bly (AMNH); 7 mi E of Bly (AMNH); 13 mi W of Keno on Rt. 66, 4600 ft (AMNH); 20 & 30 mi E of Klamath Falls (OSU); New Horizons Boys Ranch (OSU); 1 mi E of summit of Cascade Mts. on Hwy. 66 (OSU); Swan Lk. (OSU). **Lake Co.:** Dairy Crk. Grd. Sta., 31 mi NW of Lakeview (OSU); Hart Mt., Antelop Nat'l. Refuge Hq., (CAS), & Hot Sprgs. Cmpgrd., 6050 ft (OSU); 11 mi NW of Silver Lk. on Hwy. 31, 1500 m (AMNH, OSU); 10 mi S of Silver Lk. (OSU); Warner Cyn. nr. Lakeview, roadside 2 mi E of Hwy. 395, 5450 ft (OSU). **Lane Co.:** Cottonwood Reservoir, T38E R13E Sec 18 (AMNH). **Linn Co.:** Lost Prairie, 34 mi E of Sweet Home, 3400 ft (OSU). **Malheur Co.:** 5 mi NW of Ontario (OSU). **Umatilla Co.:** 1 mi N of Kamela (AMNH); Ukiah (AMNH). **Union Co.:** North Powder (OSU). **Wallowa Co.:** 5 mi N of Enterprise, 3950 ft (OSU); Lone Sprg., 32 mi N of Joseph, (OSDA); Joseph (OSU). **Wasco Co.:** 8 mi S of The Dalles, 475 ft (OSU); The Dalles (USNM); Knebal Sprgs., 24 mi SW of The Dalles, 3900 ft, 8 July 1978 (AMNH); Mosier (AMNH); 6 mi N of Simnasho (OSU). **Washington Co.:** Dilley (USNM). **Wheeler Co.:** Ochoco Nat'l. For., north part of Pisgah Mt. (AMNH); 17 mi E of Mitchell (UCB); 4.5 mi S of Mitchell on Summit Prairie Rd. (AMNH); 17 mi E of Mitchell (UCB). **County ?:** Criterion Summit (USNM). SOUTH DAKOTA: **Butte Co.:** Castle Rock (CNC); Newell (USNM). **Fall River Co.:** Black Hills (CNC); Hot Sprgs. (USNM); Igloo (LACM); Oelrichs (CNC). **Haakon Co.:** Philip (USNM). **Jones Co.:** Capa (CAS). **Lawrence Co.:** Lead (UCD, USNM); Spearfish (USNM). **Pennington Co.:** Rapid City (AMNH, USNM). **County ?:** Englewood (USNM). Strool (USNM). UTAH: **Box Elder Co.:** Raft River Mts., Clear Crk. Cmpgrd. (BYU); Plymouth (OSU). **Cache Co.:** Blacksmiths Fork Cyn. (AMNH, OSU, USU); Franklin Basin (USU); Green Cyn. Trl., 5 mi NE of Logan (AMNH); Hardware Rch. (USU); Logan (AMNH, OSU, USNM, USU); Logan Cyn. (CNC, OSU, USU); Logan Cyn. Sinks (USU); Logan Cyn. Summit, 7800 ft (USU); Ricks Sprg. (USU); Tony Grove (USU); White Pine Lk., 8000 ft (CAS). **Dag-**

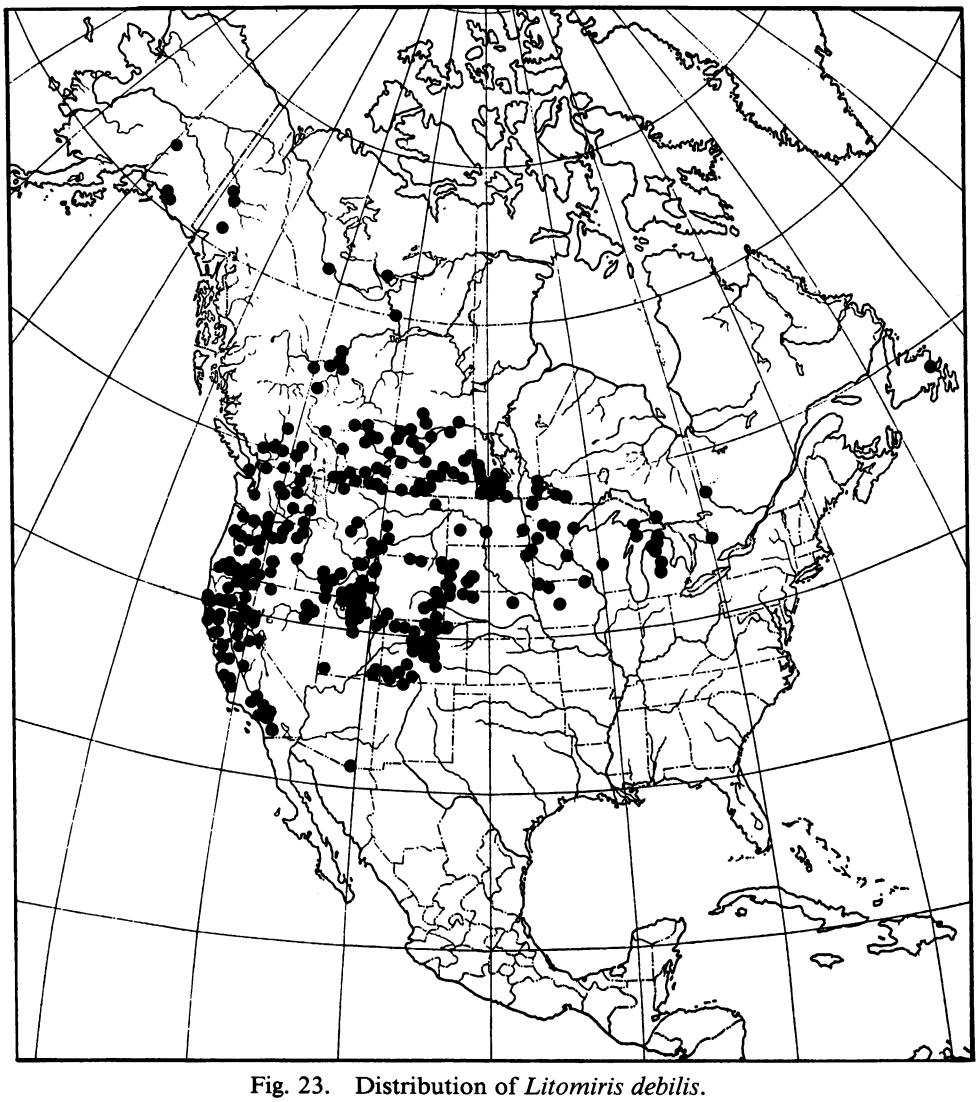

Fig. 23. Distribution of *Litomiris debilis*.

gett Co.: Dowd Sprg.; Sharp Crk. (OSU). **Juab Co.:** Mt. Nebo Loop, Devils Kitchen (OSU). **Rich Co.:** Allen Cyn. (UCD); Monte Cristo (OSU, USU); Randolph (USNM); Woodruff (OSU, USNM). **Salt Lake Co.:** Parley's Cyn. (USNM). **San Juan Co.:** Abajo Mts., 0.2 mi SE of Devils Cyn. Cmpgrd., 6900 ft (AMNH); Buckboard Flat Cmpgrd., 7 mi W of Monticello, 8800 ft (AMNH); Dalton Sprgs. Campgrd., 5 mi W of Monticello, 8500 ft (AMNH); Monticello (USNM). **Summit Co.:** Coalville (USNM). **Uintah Co.:** Brown Pk. (USNM); Iron Sprgs. Cmpgrd., 25 mi N of Vernal, 8400 ft (AMNH). **Utah Co.:** Alpine (UCD); Blackett's Pasture, (USU); Mt. Nebo Loop (UCD). **Weber Co.:** Head of Beaver Crk. (USNM); 8 mi S of Monte Cristo (OSU). **Washington Co.:** Pine Valley Cmpgrd. (USU). WASHINGTON: **Adams Co.:** Lind (USNM). **Asotin Co.:** 3 mi N of Anatone (OSU). **Chelan Co.:** 12 mi SW of Chelan (OSU). **Douglas Co.:** Waterville (USNM). **Grant Co.:** Grand Coulee, Coulee City (USNM). **Klickitat Co.:** Brooks Mem. St. Pk. (UCD). **Okanogan Co.:** 7 mi NE Coulee City (OSU); W Frk. of Sanpoil R. (OSU). **Pierce Co.:** Fort Lewis (CAS); Roy (USNM). **Whatcom Co.:** Ross Lk., Lightning Crk. Area (OSU). **Whitman Co.:**

Pullman (USNM). **County ?:** Wawawai (AMNH, USNM). **Wisconsin: Wood Co.:** ¼ mi N of C.S.N.[?] (USNM). WYOMING: **Albany Co.:** Rock River (USNM). **Crook Co.:** Reuter Cyn. Cmpgrd., 5 mi N of Sundance, 6100 ft (AMNH). **Goshen Co.:** Torrington (AMNH). **Laramie Co.:** Cheyenne (USNM). Cheyenne, Aug. [18]70; *Megaloceroea debilis* Uhler; Type No. 700, U.S.N.M. [all handwritten] (1♀, paralectotype). **Lincoln Co.:** Auburn (BYU). **Niobrara Co.:** Lusk (AMNH, USNM). **Platte Co.:** Sunrise (AMNH). **Sheridan Co.:** Big Horn Mts., 6500 ft (USNM); Ranger Crk. Cmpgrd., 18 mi SW of Big Horn, 7800 ft (AMNH); Swamp Crk. Hill, 16 mi SW of Bighorn, 7900 ft (AMNH). **Teton Co.:** Grand Teton Nat'l. Pk., Teton Sci. School, nr. Kelly at Slide Lk. (CAS); Jackson, 6000 ft (AMNH). **Uinta Co.:** Jct. of Rt. 150 & Co. Rd. 159 (AMNH). **Weston Co.:** 4 mi W of Newcastle (OSU). **County ?:** Antler (USNM). Freeze Out (USNM).

DISCUSSION: Uhler (1871) listed the name *Miris debilis* Uhler and did not include a description. Uhler (1872) described *debilis* from a type series containing material from Colorado, Montana and Wyoming. I located a female in the National Museum, Washington, D.C. with a red type label (number 700). However, this lectotype designation was never published. Herein, I designate a male from Weld Co., Colorado as the lectotype, and under Material Examined list the paralectotypes. All Uhler type material is deposited in the U.S. National Museum.

Bliven (1973) described *tritavus* based on 67 specimens collected in Humboldt Co., California, from June 12 to July 6 spanning the years 1938 to 1960. He distinguished this species from "most of our other described forms" by the structure of the parameres. Unfortunately, when the California Academy of Sciences acquired the Bliven Collection in 1981 all the types from his 1973 paper were either not present and/or were not labeled as such (Arnaud, personal commun.). However, I have examined two males and four females, prepared by the Academy staff from unmounted material collected by Bliven, that agree with the dates and localities as specified in the original description. These specimens have characters which are well within the range of variation I have observed in the widespread species *debilis*. Therefore, I designate one male of Bliven's specimens the lectotype and the other five specimens paralectotypes, and place *tritavus* as the junior synonym of *debilis*.

Reuter (1909) notes that *debilis* had macropterous and brachypterous morphs (forms), but he did not mention the sex of the brachypterous form, nor did he clearly define his use of that term. Reuter merely states that "the elytra and wings are as long as or somewhat shorter than the abdomen," but did not mention the state of development of the membrane. The length of the membrane is critical, because some gravid *debilis* have abdomens that extend beyond the apex of fully developed membranes. However, Reuter did state that "the pronotum of the brachypterous specimens were narrower behind and flat (or smooth), not arched and anteriorly slanting." This type of pronotum is only present in females of *curtus*; the hemelytra of *curtus* is termed submacropterous (with reduced but obvious membrane) herein. The "brachypterous" specimens Reuter (1909) investigated were from Washington state and collected by Heidemann. I have not located similarly labeled material in the National Museum, but have many additional *curtus* from this area on hand, and believe Reuter's brachypterous *debilis* to be *curtus*.

Litomiris gracilis (Van Duzee)

Figures 6, 17c, 21 c, 24a–d

Stenodema gracilis Van Duzee, 1914: 25 (new species).

Megaloceroea gracilis: Van Duzee, 1916, 36 (checklist). – Van Duzee, 1917, 306 (catalog). – Carvalho, 1959: 293 (catalog).

Litomiris gracilis: Slater, 1956: 120 (new combination). – Knight, 1968: 178 (key and distribution). – Henry and Wheeler, 1988: 385 (catalog).

LECTOTYPE: Male; San Diego Co., 4-11-[19]14, Cal., E. P. Van Duzee; LECTOTYPE *gracilis*; EP Van Duzee Collection; CAS Type No. 2013; *Stenodema gracilis* Van Duzee, det. M. D. Schwartz, 1988 LECTOTYPE; deposited in the CAS. Not examined.

DIAGNOSIS: Recognized by the explanate and upturned lateral margin of the pronotum, and the stout first antennal segment beset with short piceous setae.

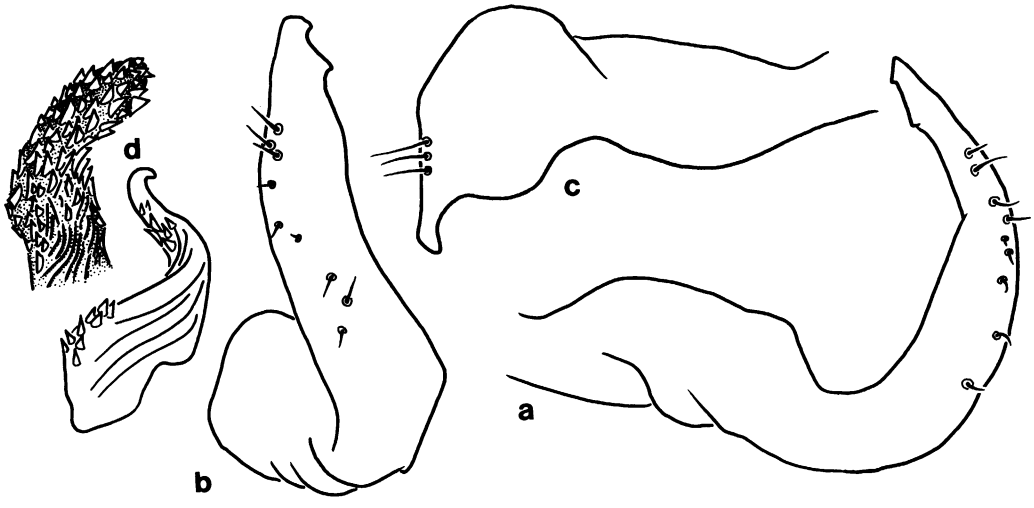

Fig. 24. *Litomiris gracilis*, male genitalic structures. a, b. Left paramere. **a**. Lateral view. **b**. Distal view. **c**. Lateral view of right paramere. **d**. Lobal sclerites.

REDESCRIPTION: *Male.* **Dorsal Aspect:** Total length 7.30–8.10; length from apex of tylus to cuneal fracture 5.00–5.60; testaceous with fuscous suffusion on hemelytra, and broad, piceous, bilateral vitta extending from scutellum to tylus (figs. 17c, 21c); dorsal surface with deep punctures. **Head:** Width across eyes 0.79–0.85; interocular width 0.43–0.48; length from posterior margin of eye to apex of tylus in dorsal view 0.70–0.78; lateral portion of head including sides of tylus, jugum, lorum, base of antennal fossa, posteriad of eye pale to dark fuscous; ventral portion of tylus pale; labium just surpassing mesocoxae or attaining metacoxae; length 2.60–3.00; antenna rufus, fuscous, or piceous, sometimes with interior surface pale; length of segment I 1.15–1.43; II 2.80–3.40. **Pronotum:** Posterior width 1.30–1.45; lateral margin explanate and slightly foliaceous; vitta wide, spanning from junction of explanate margin and disk to interior margin of calli. **Hemelytra:** Clavus with deep punctures, corium with diminished punctures. **Ventral Aspect:** Pale with variable dark infuscate. **Legs:** Femora with fuscous spots, tarsus and tibia distally fuscous to piceous. **Genitalia:** Figure 24a–d. *Left paramere:* Outer surface of arm and angle smooth; inner surface of shaft without flange basally. *Right paramere:* Distal half rounded, smaller than in *curtus* and *debilis*. *Vesica:* Linear lobal sclerite small, narrow; twisted lobal sclerite small with short distal portion; small basal sclerite posteriad of secondary gonopore diminished, smooth

Female. Slightly more robust then male; otherwise similar in coloration and structure. **Measurements:** Total length 7.80–8.10; length from apex of tylus to cuneal fracture 5.70–5.90; width across eyes 0.88–0.91; interocular width 0.50–0.54; length from posterior margin of eye to apex of tylus in dorsal view 0.80–0.83; labial length 2.90–3.10; length of antennal segment I 1.40–1.43; II 3.20–3.40; posterior width of pronotum 1.43–1.53.

HOSTS: Unknown.

DISTRIBUTION: Figure 6. Southern California from San Luis Obispo to San Diego counties.

MATERIAL EXAMINED: 18 specimens from these localities – *UNITED STATES:* CALIFORNIA: **Los Angeles Co.:** Los Angeles Co. (USNM). **San Diego Co.:** San Diego Co., 13 Apr. 1914, 8 May 1913, 24 May 1913, 5 June 1913, [San Diego, Lakeside, and Mussey's; from the original description], (8♂, 2♀ paralectotypes, CAS). **San Luis Obispo Co.:** Huasna Valley, 18.5 mi E of Arroyo Grande, 1100 ft, 9 May 1985 (AMNH). **Ventura Co.:** Ojai, 27 June 1956 (CAFA).

DISCUSSION: Van Duzee (1914) described *gracilis* based on a series of 11 specimens collected from San Diego Co., California. In the original description he did not designate types, however in the type collection of the California Academy of Sciences, San Fran-

cisco, there is a male bearing a CAS Type label (no. 2013) and a handwritten lectotype label (Arnaud, personal commun.). Herein, I designate this specimen the lectotype and all of the other syntypes at the CAS as paralectotypes affixing such labels to the pins and listing them under Material Examined. A pair of the type series, collected on May 24, 1913, are mounted on the same pin; the male is *gracilis*, however, the female is *debilis*. I have remounted the specimens, copied the label data, and added a corrected determination label. Van Duzee (1914) wrote that he "received a pale example" of *gracilis* from Carberry, Canada. It is my determination that a male retained in the California Academy collection from Carberry (and possibly examined by Van Duzee) and other material from this and adjacent localities retained at the Canadian National Collection are all *debilis*.

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