

New species of *Cerobasis* and *Psyllipsocus* from México, and a list of Mexican Trogiomorpha (Psocoptera)

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Abstract

Three new species of *Cerobasis* (Trogiidae) and three new species of *Psyllipsocus* (Psyllipsocidae) from México are here described, which rises to seven the number of Mexican *Cerobasis*, and rises to nine the number of Mexican *Psyllipsocus*. Identification keys for the Mexican species of both genera are provided. The Mexican species of Trogiomorpha are thus known to consist of 46 species, of which 25 (54%) are endemic to this country. Lists of *Cerobasis* and *Psyllipsocus* species are presented, as well as a list of the known Mexican Trogiomorpha, including the distribution in this country of each species.

Introduction

Trogiomorpha is one of the three suborders currently recognized in the Psocoptera; it is the smallest in number of species, and the most primitive, to judge by the presence of plesiomorphous characters (Smithers, 1972). The separation of the three suborders of the Psocoptera is based mostly on number of antennal flagellomeres, number of segments in labial palps, degree of fusion of filaments of the hypopharynx, number of tarsomeres, presence or absence of pterostigma, and degree of thickness of this area of the forewing. The Trogiomorpha are recognized -as adults - by having antennae of more than 20 segments (never secondarily annulated), tarsi of three segments, pterostigma absent or not thickened, labial palps with two segments, and filaments of the hypopharynx separated throughout their length (Badonnel, 1951; Smithers, 1970; New, 1974).

The purpose of this work is to describe new Mexican species of the trogiomorph genera *Cerobasis* and *Psyllipsocus*, and to present a list of the trogiomorph species that have been, so far, recorded in México, including the general distribution in this country. The new species are deposited in the Insect Collection, Instituto de Biología, UNAM (IBUNAM). The illustrations were made utilizing a drawing tube, and the measurements (lengths given in microns), were taken on parts of the right side of the body, mounted on

slides, either in Hoyer's Medium or in Euparal, utilizing a filar micrometer whose measuring unit was 136 microns for wings and 53 microns for other parts. Leg measurements are of the right hind leg. Parts measured and proportions are abbreviated in the text as follows: FW: fore wing; HW: hind wing; F: femur; T: tibia; t1, t2, t3: tarsomeres 1, 2, and 3; P3, P4: third and fourth segments of maxillary palp; f1...fn: antennal flagellomeres 1...n; IO: minimal distance between compound eyes; D: antero-posterior diameter of compound eye; d: transverse diameter of compound eye; PO: d/D. Interocular distance (IO), and eye size (D and d), were measured following Badonnel's method, but in frontal view of heads mounted on slides (Ball, 1943). In the descriptions presented below, color was recorded on specimens preserved in 80% alcohol. The specimens studied were collected by the author, unless otherwise indicated.

SYSTEMATIC TREATMENT

Family Trogiidae

Cerobasis alpha n. sp.
(Figs. 1-9)

DESCRIPTION: FEMALE. Color: Body pale brown dorsally, white ventrally. Compound eyes black;

epicranial ecdysial lines distinct; head pattern as in Fig. 1, with areas above arms of epicranial ecdysial lines dark brown, spotted, and area between epicranial ecdysial lines and epistomal suture white, with distinct, concave mark in the middle. A dark brown band on each gena, from compound eye to antennal fossa, partially surrounding it; each band with an elongated fenestra next to the compound eye. Postclypeus irregularly pigmented, dark brown. Proximal halves of P3 and P4 dark brown. Antennae with scape and pedicel dark brown, and flagellomeres 1-7 proximally white, with apices dark brown; distal flagellomeres pale brown. Thoracic pleura chocolate brown. Legs (Fig. 7), with coxae and trochanters white, femora white, with apices dark brown and a mesal dark brown spot on inner side. Tibiae white, each with dark brown bands near the proximal and distal extremes; t1 dark brown proximally, dirty white distally; t2 and t3 pale brown. Paraprocts white, only slightly pigmented; epiproct white, with an irregular, longitudinal pigmented band (Fig. 6). Clunium pale brown, with a pigmented area next epiproct (Fig. 8).

Morphology: Apterous. Gonapophyses (Fig. 2) elongate, typical of the genus, with outer edge deeply pigmented. Sclerite of spermathecal duct not discernible. Parietal glands of spermatheca (Fig. 5), with central area of large papillae surrounded by a circle of pores. Paraprocts (Figs. 6 and 8) approximately elliptical, setose, each with a strong, median spine; without discernible sensory fields. Epiproct (Figs. 6 and 8) trapezoidal, setose.

Measurements: F: 490; T: 823; t1: 286; t2: 75; t3: 73; P4: 109; f1: 100; f2: 89; f3: 85; f4: 92; f5: 85; f6: 86; f7: 72; f8: 65; f9: 60; f10: 68; IO: 424; D: 183; d: 93; IO/D: 2.31; PO: 0.50

MALE. Color: Same as the female.

Morphology: Hypandrium typical of the genus, with sides parallel and apex slightly rounded; distal half pigmented and proximal half hyaline; hypandrial brush with 74-99 macrosetae (\bar{x} = 84.7, n = 4), each macroseta with apex bifid (Fig. 4). Phallosome (Fig. 3), with stout parameres, apically rounded, internal sclerites anteriorly blunt, and two mushroom-shaped internal apodemes.

Measurements: F: 430; T: 680; t1: 256; t2: 67; t3: 66; P4: 108; f1: 93; f2: 86; f3: 87; f4: 88; f5: 86; f6: 84; f7: 66; f8: 69; f9: 66; f10: 66; IO: 387; D: 168; d: 83; IO/D: 2.3; PO: 0.49

TYPE LOCALITY. MEXICO: Baja California Sur. 19 Km NW San José del Cabo, Hwy. 1, 115 m., 22.VIII.1974, beating vegetation with dead branches

and leaves. Holotype m, allotype f, 14f, and 10m paratypes (IBUNAM).

RECORDS. MEXICO: Baja California Sur. 34 Km. NW La Paz, 23.VIII.1974, Hwy. 1, beating dead branches of shrubs, 1m. 100 Km. W San Ignacio, Hwy. 1, 80 m., 24.VIII.1974, beating branches of shrubs with abundant lichens, 7f, 3m.

Cerobasis clarionensis n. sp.
(Figs. 10-19)

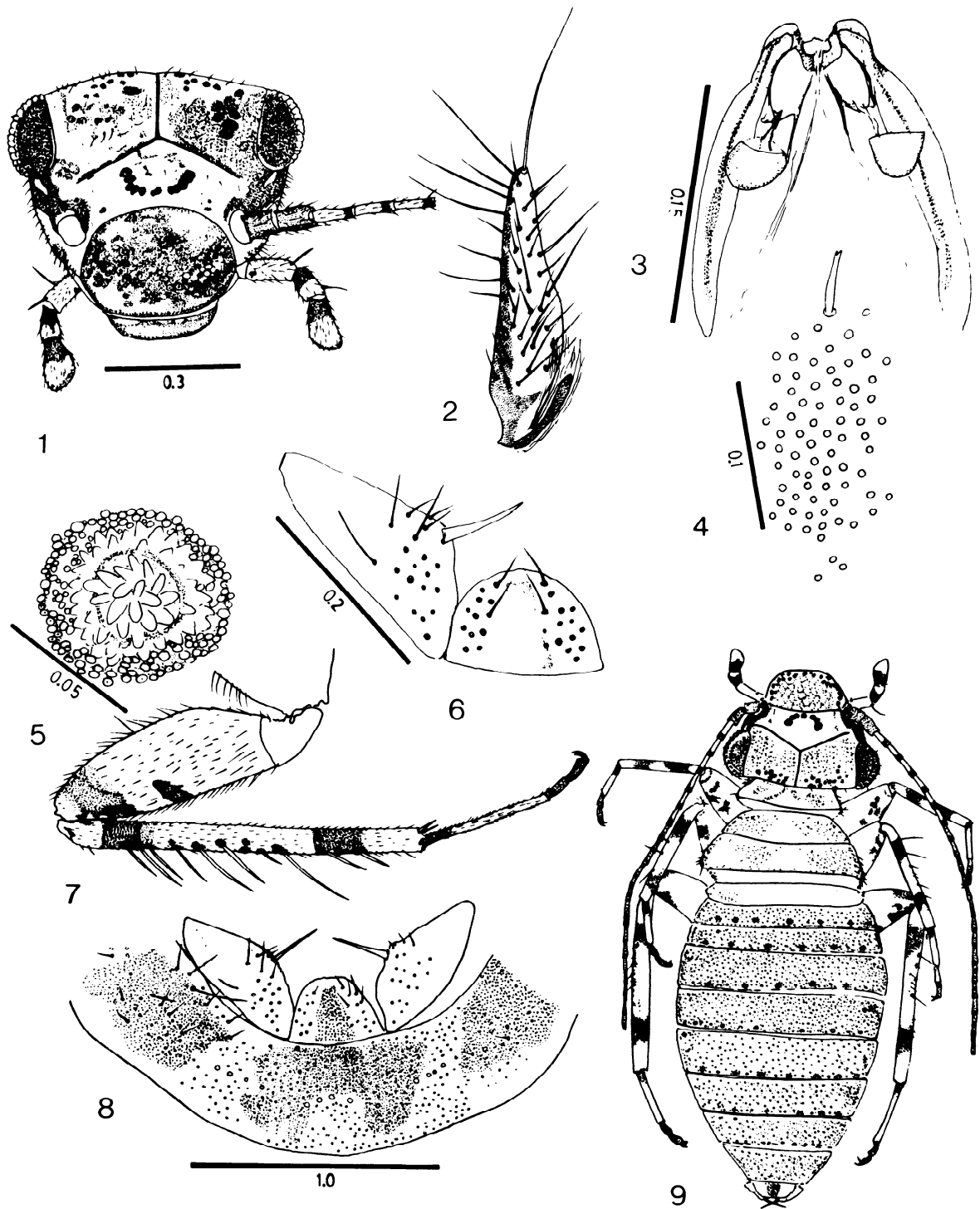
DESCRIPTION: FEMALE. Color: Ground color creamy white, with spots and bands pale brown and dark brown (Figs. 12, 14). Compound eyes black; epicranial ecdysial lines ochre, slender, well defined. In the middle of the front, and close to the epistomal suture, a V-shaped, pigmented band; also a wide brown band on each gena, from compound eye to epistomal suture, partially enclosing the antennal fossae. Vertex with an elongate pigmented band to each side of epicranial ecdysial line. P3 and P4 pale brown proximally. Scape and pedicel pale brown, first six flagellomeres with apices dark brown, and distal flagellomeres pale brown. Thorax with a reddish brown, irregular, longitudinal band along pleura, nota with a reddish brown spot to each side of longitudinal midline. Legs with coxae and trochanters dirty white, femora whitish, with apices brown, tibiae dirty white, with a dark brown band towards each extreme; t1 proximally dark brown; t2 and t3 pale brown. Abdomen with tergites spotted, forming one middle longitudinal broad band, and two slender longitudinal bands on each side (Fig. 14). Paraprocts pale brown, uniformly pigmented; epiproct white, with a mesal, longitudinal, almost rectangular brown area (Fig. 16). Pigmentation of clunium (Fig. 16).

Morphology: Apterous. Gonapophyses (Fig. 10), typical of the genus; sclerite of spermathecal duct and parietal glands of the spermatheca not discernible. Paraprocts semi-elliptical, setose; epiproct rounded posteriorly, setose (Fig. 16).

Measurements: F: 396; T: 672; t1: 220; t2: 53; t3: 57; P4: 108; f1: 111; f2: 113; f3: 101; f4: 98; f5: 84; f6: 82; f7: 59; f8: 64; f9: 57; f10: 57; IO: 333; D: 137; d: 71; IO/D: 2.43; PO: 0.51

MALE. Color: Same as the female.

Morphology: Hypandrium (Fig. 15), almost straight posteriorly; only slightly pigmented anteriorly; hypandrial brush with 68-76 macrosetae (n = 2), each seta apically bifid (Figs. 15, 17, 19). Phallosome



Figures 1-9. *Cerobasis alpha* n.sp. 1. Frontal view of head, f. 2. Right gonapophysis, f. 3. Phallosome, m. 4. insertions of macrosetae of hypandrial brush, and one macroseta, m. 5. Parietal gland of spermatheca, f. 6. Right paraproct and epiproct, f. 7. Right hind leg, f. 8. Paraprocts, epiproct and pigmentation of clunium, f. 9. Dorsal view of female. Scales in mm. Figure 2 to scale of Figure 6. Figure 7 to scale of Figure 1. Figure 9 to scale of Figure 8.

(Fig. 18). with parameres distally rounded, internal sclerites anteriorly pointed, and internal apodemes rounded. Paraprocts and epiproct same as the female.

Measurements: F: 330; T: 495; t1: 188; t2: 50; t3: 46; P4: 48; f1: 91; f2: 77; f3: 85; f4: 74; f5: 66; f6: 57; f7: 56; f8: 55; f9: 53; f10: 47; IO: 284; D: 128; d: 60; IO/D: 2.21; PO: 0.46

TYPE LOCALITY. MEXICO: Revillagigedo Archipelago. Clarión Island. Ca. Naval Garrison (ca. Sulphur Bay), 15.XI.1988, on dead leaves of grasses. Holotype m, allotype f, and five paratypes of each sex (IBUNAM).

RECORDS. Clarión Island, 10-16.XII.1987, beating vegetation near Sulphur Bay, E. Barrera & A. Ocampo, 16f, 5m. 11.XI.1988, ca. Sulphur Bay, on Central Plateau, and slopes from southern edge of island to Central Plateau, beating grasses, leguminous plants, shrubs, *Croton* and *Karwinskia*, A.N. García Aldrete, J.L. Colín & A. Cadena, 23f, 14m. 14.XI.1988, near Pico Tienda de Campaña, beating *Karwinskia*, 1f. 15.XI.1988, near Pico Gallegos, beating *Karwinskia*, 3f, 2m.

Cerobasis lapidicola n. sp.
(Figs. 20-30)

DESCRIPTION: FEMALE. Color: Body dorsally dark brown, ventrally white, with pattern of pigmentation variable in abdomen (Figs. 21, 25). Compound eyes black; epicranial ecdysial lines dark brown, distinct, with very long arms. Head pattern as in Fig. 22; areas above arms of epicranial ecdysial lines pale brown; area below arms of epicranial ecdysial lines dirty white. A dark brown band on each gena from compound eye to epistomal suture, partially enclosing the antennal fossae. P3 and P4 dark brown proximally, dirty white distally. Scape and pedicel dark brown; first four antennal flagellomeres with apices dark brown, proximally pale brown (Figs. 20, 22); distal flagellomeres brown. Thorax with pleura dark brown. Legs with coxae, trochanters and femora white, tibiae pale brown, with a broad, dark brown band, towards each end; t1, t2, and t3 brown. Clunium uniformly pigmented (Fig. 30); paraprocts pale brown, epiproct white, with a longitudinal, trapezoidal area in the middle.

Measurements: F: 604; T: 917; t1: 411; t2: 71; t3: 68; P4: 163; f1: 163; f2: 155; f3: 155; f4: 163; f5: 155; f6: 165; f7: 139; f8: 152; f9: 120; f10: 114; IO: 408; D: 215; d: 122; IO/D: 1.89; PO: 0.57

Morphology: Gonapophyses (Fig. 23), typical of the genus; opening of spermathecal duct simple, without discernible sclerite. Parietal glands of the spermatheca not discernible. Paraprocts elongate, semi-elliptic, setose. Epiproct trapezoidal, setose (Fig. 30).

MALE. Color: Same as the female, but slightly less pigmented.

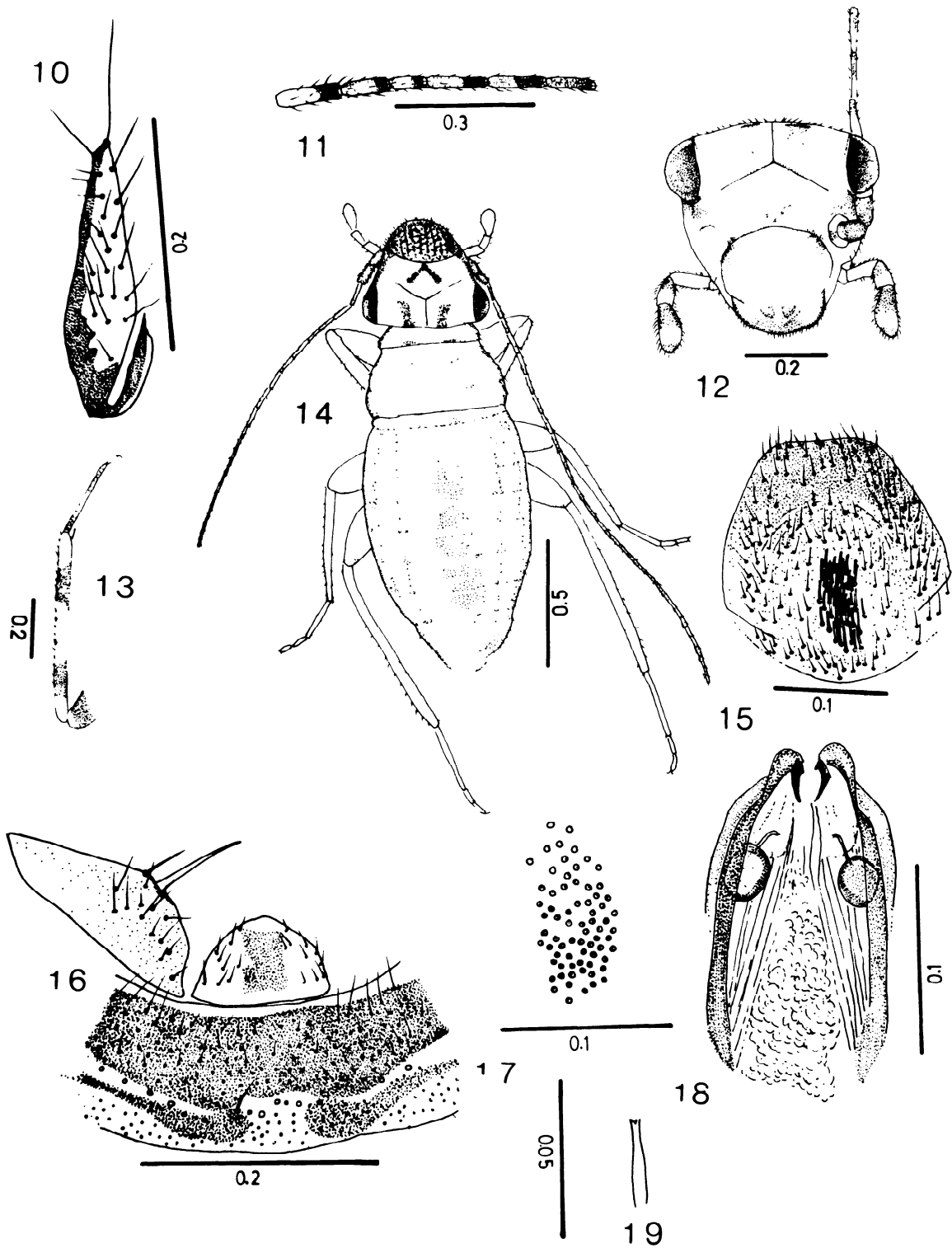
Morphology: Hypandrium (Fig. 26), rounded anteriorly, almost uniformly pigmented, setose, without a well defined brush; brush area with 57-63 slender, distally acuminate setae (n=2), not different from setae on rest of the surface of hypandrium. Phallosome (Fig. 27), with elongate internal sclerites anteriorly acuminate, and rounded, internal apodemes. Paraprocts, epiproct and pigmentation of clunium as in the female.

Measurements: F: 505; T: 752; t1: 359; t2: 67; t3: 57; P4: 144; f1: 144; f2: 143; f3: 135; f4: 133; f5: 144; f6: 139; f7: 131; f8: 130; f9: 108; f10: 91; IO: 307; D: 192; d: 120; IO/D: 1.59; PO: 0.62

TYPE LOCALITY. MEXICO: Revillagigedo Archipelago. Socorro Island, Barranca del Muerto, 300m., 3.X.1988, on rock wall with lichens, L. Cervantes, A. Cadena and A.N. García Aldrete. Holotype m, allotype f, 19f and 9m paratypes (IBUNAM).

RECORDS. Revillagigedo Archipelago: Clarión Island, near Pico Tienda de Campaña, 200m., 14.XI.1988, in concavities of calcareous rocks, covered with lichens, towards northeastern end of island, A.N. García Aldrete and A. Cadena, 10f, 4m. 12.XI.1988, northern edge of island, in concavities of calcareous rock wall, 5f, 1m. Ca. Pirámide (Rocas Monumento), on northwestern end of island, 13.XI.1988, on calcareous rock wall with lichens, 7f, 7m. 12.XI.1988, near well on southern edge of island, ca. Sulphur Bay, on dead fronds of coconut palm, 2f. 10.XI.1988, ca. Naval Garrison, on ground, J.L. Colín and A. Cadena, 1f.

COMMENTS. The specimens from Clarión Island are less pigmented, the difference between proximal and distal parts of the first antennal flagellomeres is sharper, and the brown bands of the tibiae are more defined than in the specimens from Socorro Island. Also, the abdomen in specimens from Socorro Island is dark brown, and less pigmented and with a cross-shaped mark on tergum in the specimens from Clarión Island.



Figures 10-19. *Cerobasis clarionensis* n. sp. 10. Left gonapophysis, f. 11. First six antennal flagellomeres, f. 12. Frontal view of head, f. 13. Right hind leg, f. 14. Dorsal view of female. 15. Hypandrium, m. 16. Right paraproct, epiproct and clunium, f. 17. Insertions of macrosetae of hypandrial brush, m. 18. Phallosome, m. 19. Detail of one macroseta of hypandrial brush. Scales in mm.

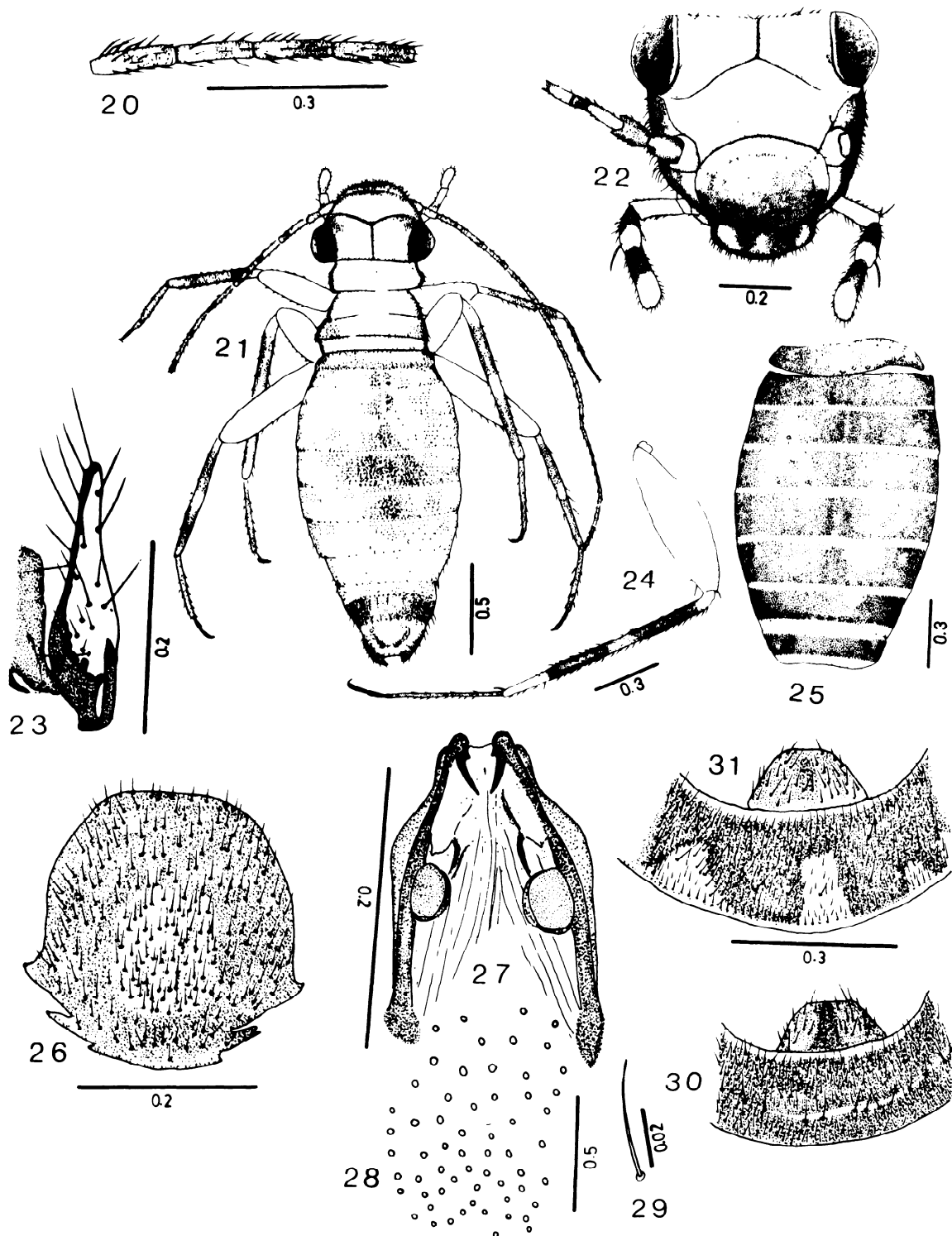
Table 1. Species of *Cerobasis* and geographical distribution

<i>C. alpha</i> García Aldrete	México	<i>C. harteni</i> Lienhard Lienhard, 1984: 757	Cabo Verde, Azores
<i>C. alfredi</i> Lienhard Lienhard, 1984: 753	Tunisia	<i>C. intermedia</i> Lienhard Lienhard, 1984: 759	Cabo Verde
<i>C. annulata</i> Hagen Hagen, 1865: 122	Europe, Canary Islands, U.S.A.	<i>C. lambda</i> Thornton & Woo Thornton & Woo, 1973: 16	Galápagos Islands
<i>C. australica</i> Enderlein Enderlein, 1907: 239	SW Australia	<i>C. lapidaria</i> Badonnel Badonnel, 1955: 32	Angola
<i>C. bundyi</i> Turner Turner, 1977: 283	Morocco, Israel	<i>C. lapidicola</i> García Aldrete	México
<i>C. caboverdensis</i> Lienhard Lienhard, 1984: 756	Cabo Verde	<i>C. maculiceps</i> Badonnel Badonnel, 1967: 547	Chile
<i>C. canariensis</i> (Enderlein) Enderlein, 1910: 169	Canary Islands	<i>C. maderensis</i> Lienhard Lienhard, 1983: 3	Madeira Island
<i>C. captiva</i> García Aldrete García Aldrete, 1988: 534	México	<i>C. maya</i> García Aldrete García Aldrete, 1991a: 324	México
<i>C. clarionensis</i> García Aldrete	México	<i>C. multispinosa</i> Obr Obr, 1948: 93	Czechoslovakia
<i>C. chrysops</i> Badonnel Badonnel, 1963: 302	Chile	<i>C. recta</i> Thornton & Woo Thornton & Woo, 1973: 17	Galápagos Islands
<i>C. guestfalica</i> (Kolbe) Kolbe, 1880: 132	Cosmopolitan	<i>C. treptica</i> Thornton & Woo Thornton & Woo, 1973: 12	Galápagos Islands, México

Key to the Mexican Species of *Cerobasis*.

1. Parietal glands of the spermatheca without central papillae; phallosome without internal apodemes *guestfalica* (Kolbe)
- 1'. Parietal glands of the spermatheca with central papillae; phallosome with internal apodemes, rounded or mushroom-shaped 2
2. Apterous 3
- 2'. Micropterous; thoracic nota with a mesal, longitudinal, slender, pigmented band; phallosome with a slender, sclerotized tooth posteriorly, on inner face of each paramere; only known from the northern edge of the Yucatán Península *maya* García Aldrete
3. Body dorsally with a longitudinal, well defined, pigmented band, from labrum to epiproct; only known from María Madre Island *captiva* García Aldrete
- 3'. Pattern of pigmentation not as above 4
4. Hypandrial brush well defined, macrosetae of brush with apex blunt or obtusely concave; clunium not uniformly pigmented; front with pigmented spots 5
- 4'. Hypandrial brush not defined, setae of brush area slender, acuminate; clunium uniformly pigmented; front without pigmented spots; only known from the Revillagigedo Archipelago *lapidicola* García Aldrete
5. Head with an elongated, longitudinal, pigmented band on each side of epicranial sulcus; thoracic nota with one pigmented spot on each side of longitudinal midline; abdomen with a median, longitudinal, broad pigmented band, with two slender bands on each side; endemic to Clarión Island *clarionensis* García Aldrete
- 5'. Pattern of pigmentation not as above; not known in Clarión Island 6
6. Central papillae of parietal glands of the spermatheca large; macrosetae of hypandrial brush obtusely concave apically *alpha* García Aldrete
- 6'. Central papillae of parietal glands of the spermatheca small; macrosetae of hypandrial brush blunt, truncate or slightly obtusely concave apically *treptica* Thornton & Woo

COMMENTS. Seven species of *Cerobasis* occur presently in México (Table 1), in which are repre-



Figures 20-31. 20-30 *Cerobasis lapidicola* n. sp. 20. First four antennal flagellomeres, f. 21. Dorsal view of female. 22. Frontal view of head, f. 23. Left gonapophysis, f. 24. Right hind leg, f (excluding coxa and trochanter). 25. Dorsal view of abdomen, f. 26. Hypandrium, m. 27. Phallosome, m. 28. Insertions of macrosetae of hypandrial brush, m. 29. Macroseta of hypandrial brush. 30. Epiproct and clunium, m. 31. *Cerobasis treptica* Thornton & Woo. Epiproct and clunium, m. Scales in mm. Figure 31 to scale of Figure 30.

sented the two groups of species recognized by Lienhard (1984) for the western-palaearctic region: group **a**, characterized by having parietal glands of the spermatheca without central papillae, and phallosome without mushroom-shaped internal apodemes; this group is represented by *C. guestfalica* (Kolbe), and group **b**, characterized by having parietal glands of the spermatheca with a central rosette of papillae, and phallosome with mushroom-shaped internal apodemes; this group is represented by the other Mexican species (Table 1).

Cerobasis guestfalica is a cosmopolitan species, that reproduces mostly by thelitoky, although males are known from England and Poland (Lienhard, 1984). Only females of *C. captiva* are known, which also suggest thelitoky, the species is confined to María Madre Island, in the Pacific, where it coexists with *C. treptica*. The other five Mexican species of *Cerobasis* are bisexual, and only one of them, *C. treptica*, presents a wide distribution, whereas the others have quite restricted areas of distribution: *C. alpha* is only known from a small area in Baja California Sur, *C. captiva* is endemic to María Madre Island, *C. clarionensis* is endemic to Clarión Island, *C. lapidicola* is endemic to the two major islands of the Revillagigedo Archipelago (Socorro and Clarión), and *C. maya* is restricted to a small area on the northern edge of the Yucatán Península.

Table 1 shows the known species of *Cerobasis* and their distribution; not considering *C. guestfalica* on account of its cosmopolitanism, the genus is almost equally represented in the Neotropical and Palaearctic regions, with ten and nine species respectively, none in common; one species each occur in the Australian and Aethiopian regions, and one of the Palaearctic species (*C. annulata* Hagen), has also been recorded in the Nearctic region (Gurney, 1950), a distribution that has been observed for several species of psocids (Baz, 1988; García Aldrete, 1991b; Lienhard, 1986; Mockford, 1980, 1989). It is remarkable that ten of the 22 known species (45.4%) are strictly insular, and it is also remarkable that seven of the 22 species of *Cerobasis* (31.8%) occur in México, to give more evidence of the rich biological diversity of this country.

Family Psyllipsocidae

Psyllipsocus neoleonensis n. sp.
(Figs. 32-36)

DESCRIPTION: FEMALE. Color: Body creamy white, with reddish brown marks, as described below.

Compound eyes black, ocelli clear, with reddish centripetal crescents. Epicranial ecdysial line only discernible on vertex; head pattern (Fig. 32), with an elongated, longitudinal spot, enclosing epicranial ecdysial line, three transverse brown bands between ocellar group and epistomal suture, and a dark brown band on each gena, below the antennal fossa. Scape and pedicel each with a longitudinal reddish band; first antennal flagellomere with proximal and distal ends brown, distal flagellomeres brown. Maxillary palps brown. Thorax milky white, with tergal lobes of meso- and metathorax brown; thoracic pleura white, with some brown spots next to coxae; thoracic sternites reddish brown. Legs brown, except distal ends of coxae, trochanters and proximal ends of femora, which are white. Wings (Fig. 34), hyaline, with brown areolae around setal insertions on fore wing, and dark bands along veins of forewing as illustrated. Abdomen dirty white, with tergites and sternites 2-5 reddish brown. Paraprocts each with a brown band as illustrated (Fig. 33). Epiproct with sides more pigmented than central area. A brown, almost circular area next to epiproct, in clunium and adjacent tergite (Fig. 33).

Morphology: Gonapophyses typical of the genus, with broad external valve and elongated, membranous ventral and dorsal valves. Sclerite of spermathecal duct (Fig. 35), broad, elongated.

Measurements: FW: 1979; HW: 1533; F: 859; T: 1768; t1: 712; t2: 150; t3: 116; P4: 339; f1: 311; f2: 200; f3: 194; f4: 186; f5: 183; f6: 160; f7: 166; f8: 136; f9: 143; f10: 103; IO: 308; D: 212; d: 127; IO/D: 1.45; PO: 0.59

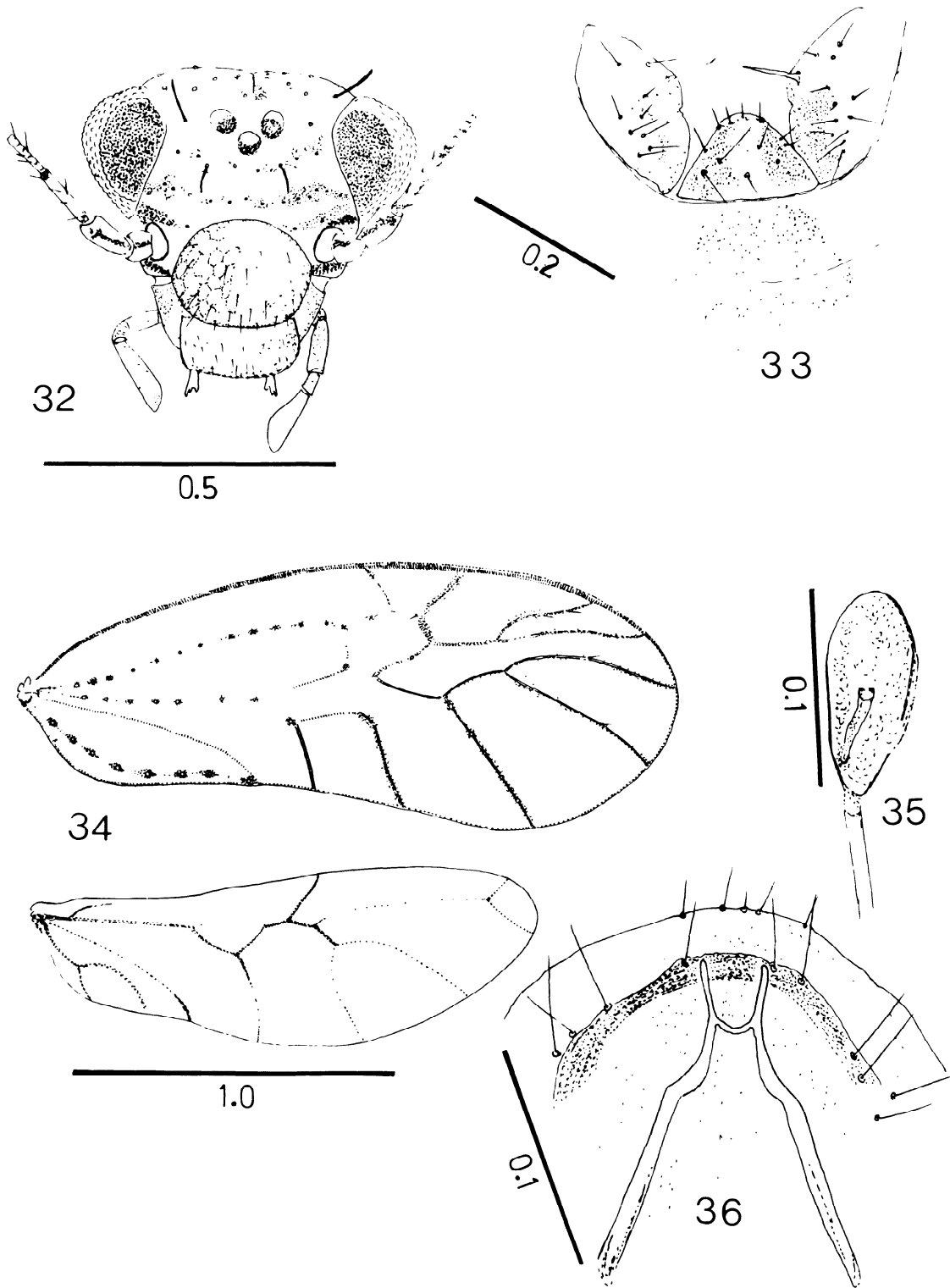
MALE. Color: Same as the female.

Morphology: Hypandrium broad, setose (Fig. 36), posteriorly rounded, with posterior edge strongly pigmented. Phallosome (Fig. 36), simple, with parameres slender, joined posteriorly by a slender bridge. Paraprocts and epiproct as illustrated for the female.

Measurements: FW: 1864; HW: 1418; F: 802; T: 1648; t1: 664; t2: 155; t3: 106; P4: 339; f1: 286; f2: 177; f3: 177; f4: 162; f5: 163; f6: 136; f7: 143; f8: 118; f9: 126; f10: 98; IO: 278; D: 207; d: 128; IO/D: 1.34; PO: 0.61.

TYPE LOCALITY. MEXICO: Nuevo León. Cerro de la Silla, near Monterrey, western slope, 800m., trail to North Peak, 12.VIII.1989, beating tree branches with dead leaves. Holotype m, allotype f (IBUNAM).

RECORDS. Nuevo León. El Cerrito, near Santiago, 470m., 30.VIII.1985, on dead, hanging fronds of *Washingtonia filifera*, 1m.



Figures 32-36. *Psyllipsocus neoleonensis* n. sp. 32. Frontal view of head, f. 33. Paraprocts, epiproct and clunium, f. 34. Fore and hind wings, f. 35. Sclerite of spermathecal duct, f. 36. Hypandrium and phallosome, m. Scales in mm.

Psyllipsocus hyalinus n. sp.
(Figs. 37–42)

DESCRIPTION: FEMALE. Color: Body creamy white, with brown areas as described below. Compound eyes black, ocelli clear, with ochre centripetal crescents; head pattern (Fig. 37), with dark brown slender bands from ocellar group to genae; two irregular bands from each compound eye to epistomal suture, enclosing antennal fossae; postclypeus dark brown. Maxillary palps dirty white, P3 and P4 with apices dark brown. Scape and pedicel dirty white, with outer margin ochre; f1 and f2 dirty white, with apices dark brown; distal flagellomeres brown. Thorax brown, with tergal lobes ochre. Wings (Fig. 41), hyaline; areola postica with a dark, slender band enclosing the veins; brown spots on confluence of Cu2 and 1A. Legs with coxae and trochanters white, femora white with a brown spot on inner margin, near distal end; tibiae white with proximal end brown and a brown band towards each end; t1 pale brown, with proximal end dark brown, t2 and t3 brown. Abdomen dirty white, with subcuticular tergal bands ochre. Paraprocts (Fig. 40), each with a broad, transverse, brown area; epiproct white, unpigmented. Clunium white in the middle, brown on each side.

Morphology: Gonapophyses with three pairs of valves: external broad, and dorsal and ventral elongate, membranous; sclerite of spermathecal duct (Fig. 39), tear-shaped, with an accessory transverse sclerite, strongly pigmented. Paraprocts (Fig. 40), setose, sensory fields with 9–10 trichobothria set on basal settes; epiproct trapezoidal, setose.

Measurements: FW: 1898; HW: 1467; F: 468; T: 886; t1: 276; t2: 64; t3: 47; P4: 149; f1: 231; f2: 139; f3: 119; f4: 114; f5: 100; f6: 92; f7: 74; f8: 75; f9: 62; f10: 64; IO: 265; D: 232; d: 127; IO/D: 1.14; PO: 0.54.

MALE. Color: Same as the female.

Morphology: Hypandrium (Fig. 42), approximately pentagonal, projected posteriorly, setose, with a strongly pigmented band running along the margins. Phallosome (Fig. 42), with parameres slender, converging posteriorly to a complex structure formed by a transverse ellipse and two longitudinal, dagger-like, sclerotized bodies. Paraprocts, epiproct and clunium, same as the female.

Measurements: FW: 1835; HW: 1380; F: 424; T: 806; t1: 298; t2: 58; t3: 53; P4: 129; f1: 201; f2: 129; f3: 122; f4: 119; f5: 96; IO: 216; D: 212; d: 112; IO/D: 1.02; PO: 0.52

TYPE LOCALITY. MEXICO: Nuevo León. Cerro de la Silla, near Monterrey, western slope, 610m., trail to North Peak, 12.VIII.1989, in concavities of calcareous rocks, covered with lichens and mosses. Holotype m, allotype f, 1f paratype (IBUNAM).

Psyllipsocus maculatus n. sp.
(Figs. 43–48)

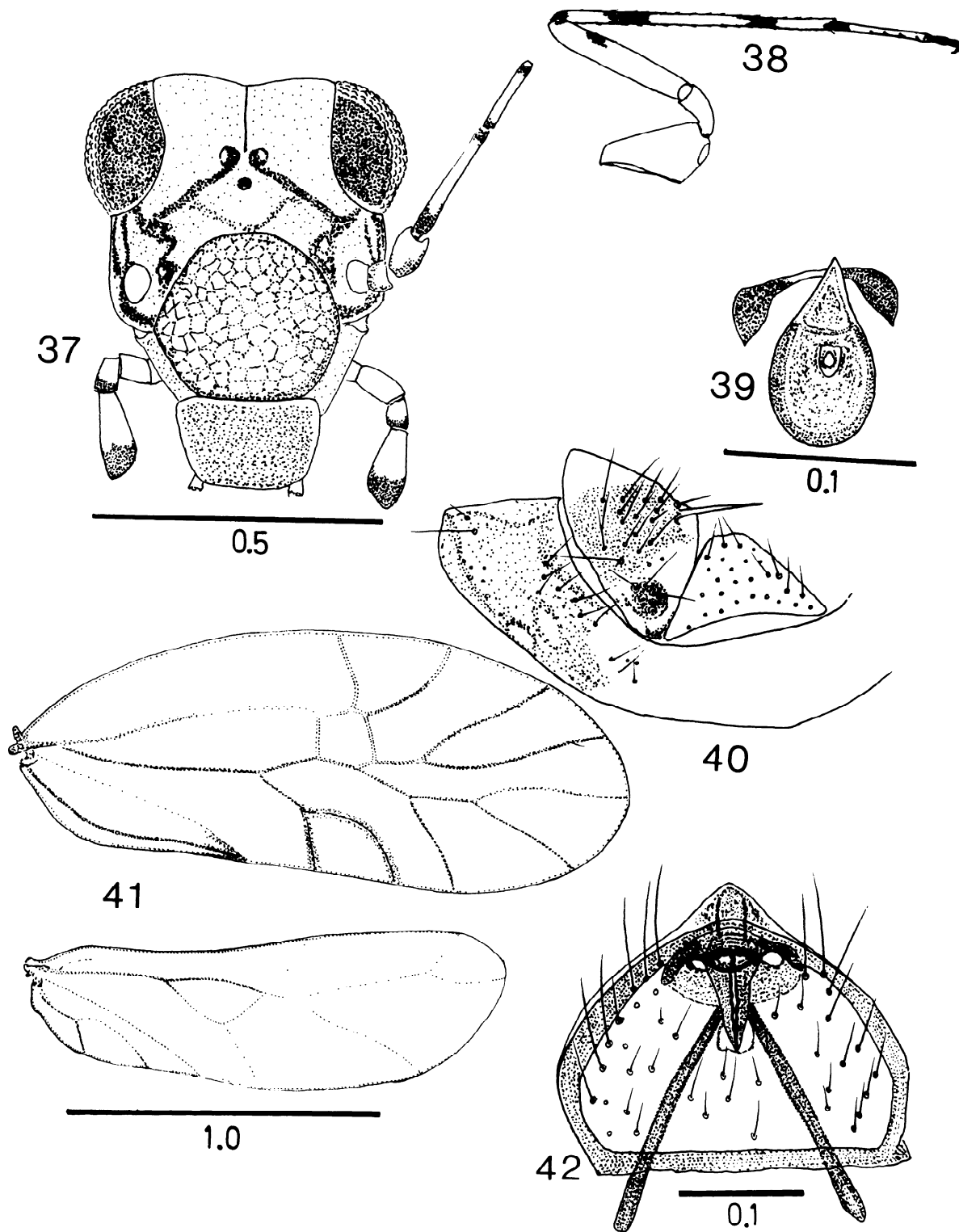
DESCRIPTION: FEMALE. Color: Body creamy white, with dark brown areas as indicated below. Head pattern (Fig. 43); compound eyes black, ocelli clear, with reddish centripetal crescents. A slender brown band from ocellar group to each gena, and a brown band from each compound eye to lower gena, behind the antennal fossa. Front and upper portion of postclypeus creamy white; lower postclypeus, genae and labrum dark brown. Maxillary palps pale brown, P2 and P3 with apices dark brown. Scape and pedicel dark brown, f1 and f2 creamy white, with apices dark brown, distal flagellomeres brown. Thorax brown, with tergal lobes of meso- and metathorax ochre. Wings (Fig. 44), hyaline, with brown areas as illustrated. Legs dark brown, except trochanters and tarsomeres, which are creamy white. Abdomen with reddish brown subcuticular rings. Paraprocts brown (Fig. 46); epiproct white; clunium with a large white area next epiproct, sides of clunium brown (Fig. 46).

Morphology: Subgenital plate setose, straight anteriorly and rounded posteriorly (Fig. 45). Gonapophyses (Fig. 45). Opening of spermathecal duct simple, with no discernible sclerite. Paraprocts semi-elliptical, setose, with seven trichobothria on sensory fields (Fig. 46). Epiproct trapezoidal, setose (Fig. 46).

Measurements: FW: 1311; HW: 1058; F: 265; T: 511; t1: 215; t2: 49; t3: 44; P4: 98; f1: 93; f2: 70; f3: 59; f4: 58; f5: 57; f6: 43; f7: 43; f8: 41; IO: 194; D: 189; d: 109; IO/D: 1.02; PO: 0.57.

MALE. Color: Same as the female. Wings with reduced pattern of pigmentation, as illustrated in Fig. 47

Morphology: Hypandrium (Fig. 48), wide, setose, straight anteriorly, and rounded, slightly projected posteriorly, with rounded lateral shoulders. Phallosome (Fig. 48), with slender, posteriorly converging parameres, and a posterior, elongate, bilaterally symmetrical piece, projected beyond the hypandrium to form an apically blunt cone. Paraprocts, epiproct and clunium as in the female.



Figures 37-42. *Psyllipsocus hyatinus* n. sp. 37. Frontal view of head, f. 38. Right hind leg, f. 39. Sclerite of spermathecal duct, f. 40. Epiproct, right paraproct and clunium, f. 41. Fore and hind wings, f. 42. Hypandrium and phallosome, m. Scales in mm. Figures 38 and 40 to scale of Figure 41.

Table 2. Species of *Psyllipsocus* and geographical distribution

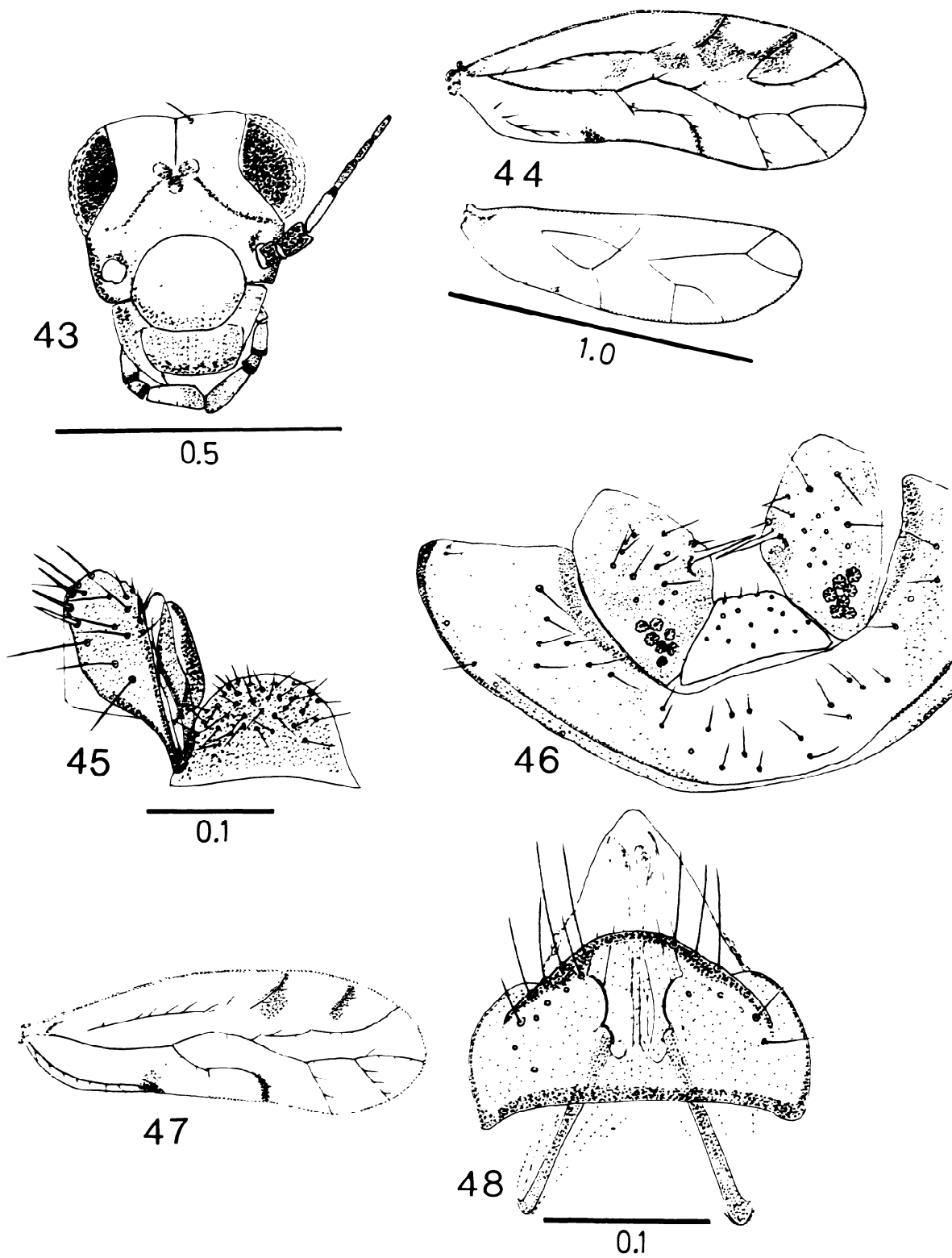
<i>P. banksi</i> Cockerell Cockerell, 1916: 136	Burma (in amber)	<i>P. metamicropterosus</i> (Enderlein) Enderlein, 1908: 775	Taiwan (Formosa)
<i>P. batuensis</i> Thornton Thornton, 1962: 442	Malaya	<i>P. minutissimus</i> (Enderlein) Enderlein, 1920: 458	Hawaii
<i>P. bombayensis</i> Menon Menon, 1942: 38	India	<i>P. monticolus</i> García Aldrete García Aldrete, 1989: 46	México
<i>P. collarti</i> Badonnel Badonnel, 1946: 140	Congo	<i>P. neoleonensis</i> García Aldrete	México
<i>P. chamela</i> García Aldrete García Aldrete, 1984: 56	México	<i>P. oculatus</i> Gurney Gurney, 1943:214	U.S.A., México, Guatemala
<i>P. decui</i> Badonnel Badonnel, 1977a: 340	Cuba	<i>P. orghidani</i> Badonnel Badonnel, 1977b: 345	Cuba
<i>P. delamarei</i> Badonnel Badonnel, 1962: 187	Argentina	<i>P. ornatus</i> Badonnel Badonnel, 1973: 63	Angola
<i>P. dorae</i> Badonnel Badonnel, 1973: 65	Angola	<i>P. ramburii</i> Selys-Longchamps Selys-Longchamps, 1872: 145	Cosmopolitan
<i>P. dubius</i> Badonnel Badonnel, 1987: 173	Venezuela	<i>P. sauteri</i> (Enderlein) Enderlein, 1906: 307	Japan, Taiwan (Formosa)
<i>P. edentulus</i> Menon Menon, 1942: 40	India	<i>P. sinicus</i> Li & Chikun Li & Chikun, 1988: 70	China
<i>P. garciamolinai</i> García Aldrete García Aldrete, 1984: 61	México	<i>P. spinosus</i> Badonnel Badonnel, 1955: 35	Angola
<i>P. hirsutus</i> Thornton Thornton, 1962: 447	Malaya	<i>P. variabilis</i> Badonnel Badonnel, 1986: 182	Colombia
<i>P. hyalinus</i> García Aldrete	México	<i>P. yucatan</i> Gurney Gurney, 1943: 197	México
<i>P. maculatus</i> García Aldrete	México		

Measurements: FW: 1261; HW: 1020; F: 212; T: 470; t1: 179; t2: 47; t3: 40; P4: 69; f1: 87; f2: 58; f3: 58; F4: 54; f5: 50; f6: 42; f7: 45; f8: 36; IO: 160; D: 170; d: 99; IO/D: 0.94; PO: 0.58

TYPE LOCALITY. MEXICO: Nuevo León. Cerro de la Silla, near Monterrey, western slope, trail to North Peak, 800m., 31.VIII.1989, in concavities of calcareous rocks, covered with lichens and mosses. Holotype m, allotype f, 9f and 4m paratypes (IBUNAM).

Key to the Mexican species of *Psyllipsocus*
(Modified from Gurney, 1943, and García Aldrete, 1989)

1. Head with well defined, transverse, pigmented bands 2
- 1'. Head pattern not as above 3
2. A U-shaped pigmented band enclosing antennal group; clunium pigmented in area next paraprocts and epiproct; fourth segments of maxillary palps short, stout; only known from the coast of Jalisco and in Yucatán *chamela* García Aldrete
- 2'. Without a band enclosing antennal group; clunium pigmented only next to epiproct; fourth segments of maxillary palps slender, elongate; only known from Central Nuevo León *neoleonensis* García Aldrete
3. Macropterous, brachypterous or micropterous, if micropterous, wings not placoid, with small setae, and traces of venation 4
- 3'. Micropterous, wings placoid, with long setae and no traces of venation; only known from a small area in the center of the Transverse Volcanic System *monticolus* García Aldrete
4. Setae of forewings not set on dark areolae 5



Figures 43-48. *Psyllipsocus maculatus* n. sp. 43. Frontal view of head, f. 44. Fore and hind wings, f. 45. Left gonapophyses and subgenital plate, f. 46. Paraprocts, epiproct and clunium, f. 47. Fore wing, m. 48. Hypandrium and underlying phallosome, m. Scales in mm. Figure 46 to scale of Figure 45. Figure 47 to scale of Figure 44.

- 4'. Setae of forewings set on dark brown, basal areolae; only known from the coast of Jalisco *garciamolinai* García Aldrete
5. Wings spotted; at least with veins of areola postica enclosed by a brown band; a pigmented band from ocellar group to each gena 6
- 5'. Wings hyaline, without pigmented bands from ocellar group to genae 7
6. Femora with pigmented spot distally on inner face; tibiae with pigmented bands towards each extreme; wings hyaline, only areola postica and distal confluence of Cu2 and 1A pigmented; only known from Central Nuevo León *hyalinus* García Aldrete
- 6'. Femora and tibiae brown; forewings of females with spots on cells R1, R3, M3, R, Cu1b, distal ends of pterostigma and areola postica and distal confluence of Cu2 and 1A, forewings of males with spots on distal ends of pterostigma, areola postica and cells R1, R3, Cu1b, and distal confluence of Cu2 and 1A; only known from central Nuevo León *maculatus* García Aldrete
7. Apical segments of maxillary palps tapering at apex, broadly rounded on inner margins; macropterous, brachypterous and micropterous; cosmopolitan; recorded in many localities throughout México *ramburii* Selys
- 7'. Apical segments of maxillary palps broad, apex more or less oblique; macropterous and brachypterous 8
8. Eyes prominent; apical segment of maxillary palps with apex weakly oblique; hypandrium without conspicuous, heavily sclerotized lateral margins; phallosome with an elongate distal structure; recorded in southern U.S. and in many localities throughout México *oculatus* Gurney
- 8'. Eyes moderately prominent; apical segment of maxillary palps with apex strongly oblique; hypandrium with heavily sclerotized lateral margins; phallosome with a rounded, distal structure; only known from Chichén Itzá, Yucatán .. *yucatan* Gurney

COMMENTS. *P. neoleonensis* is reminiscent of *P. chamela* in head and forewing pattern, and in phallosome structure; *P. hyalinus* is close to *P. oculatus* in hypandrium and phallosome structure, and *P. maculatus* differs from all other *Psyllipsocus* species in forewing and terminalia pattern, and in having a unique hypandrium and phallosome. The three species here described were found sympatrically in a limited area, between 600-800 meters of altitude above sea level, in a ravine at Cerro de la Silla, near

Monterrey, México. The habitat of *P. neoleonensis* is dead leaves and branches of broad leaved trees and dead fronds of palms, and is thus ecologically separated from *P. hyalinus* and *P. maculatus*, both found in calcareous rocks concavities and crevices; these two species live together, and they probably have microhabitat differences; the rather small size of the latter, probably facilitate this coexistence, by occupying sites that *P. hyalinus*, being much more voluminous, can not exploit (see measurements for both species). Certainly the details of their living together deserves a closer scrutiny.

Table 2 shows the known species of *Psyllipsocus* and their distribution; not considering the fossil *P. banksi* and the cosmopolitan *P. ramburii*, the genus is best represented in the Neotropical (13 species) and the Oriental (6 species) regions; four species occur in Africa, two species have been recorded in the Palearctic region, near the Oriental region (China and Japan), and one species each occur in the Pacific and Nearctic regions, so the genus is predominantly tropical. Nine of the 14 neotropical species (60%), occur in México, this figure also representing 34% of the total number of species in the genus.

Table 3 presents a list of the species of Trogiomorpha recorded in México, with the purpose of documenting in a single place dispersed information. If not definitive, this list will provide a reference base line for subsequent studies. For economy of space, only the political divisions (states), where the species have been recorded are included. The present list comprises 46 species, and reflects a considerable richness of this suborder in México.

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Table 3. Mexican species of Trogiomorpha and distribution in Mexican states (*: species endemic to México).

Group Atropetae		<i>P. oaxacanus</i> García Aldrete*	Oaxaca
Family Lepidopsocidae			
Subfamily Thyllacelinae		Subfamily Lepolepidinae	
<i>Thylacella cubana</i> (Banks)	Campeche, Chiapas, Hidalgo, Jalisco, Morelos, Nayarit, (María Madre & San Juanito Is.), Nuevo León, Oaxaca, Querétaro, Sinaloa, Tamaulipas, Veracruz	<i>Lepolepis caribensis</i> Turner	Chiapas, Veracruz.
		Family Trogiidae	
		Subfamily Trogiinae	
		<i>Cerobasis alpha</i> García Aldrete*	Baja California Sur.
Subfamily Perientominae		<i>C. captiva</i> García Aldrete*.	Nayarit (María Madre Is.).
<i>Proentomum personatum</i> Badonnel	Campeche, Colima, Chiapas, Jalisco, Tabasco, Veracruz	<i>C. clarionensis</i> García Aldrete*	Clarión Is.
<i>Soa flaviterminata</i> Enderlein	Chiapas, Guerrero, México, Oaxaca, Veracruz	<i>C. guestfalica</i> (Kolbe)	Baja California Norte, Veracruz
		<i>C. lapidicola</i> García Aldrete*	Clarión & Socorro Is.
Subfamily Lepidopsocinae		<i>C. maya</i> García Aldrete*	Quintana Roo, Yucatán
<i>Cytophania hirsuta</i> Banks	Veracruz	<i>C. treptica</i> Thornton & Woo	Baja California Sur, Coahuila, Guerrero, Jalisco, Nuevo León, Oaxaca, San Luis Potosí, Socorro Island, Sonora, Veracruz, Yucatán
<i>Echmepteryx alpha</i> García Aldrete*	Campeche, Chiapas, Guerrero, Jalisco, Michoacán, Puebla, Quintana Roo, San Luis Potosí, Tabasco, Tamaulipas, Veracruz, Yucatán	<i>Lepinotus inquilinus</i> Heyden	México
<i>E. falco</i> (Badonnel)	Campeche, Chiapas, Guerrero, Jalisco, Nuevo León, Quintana Roo, Tabasco, Veracruz	<i>L. reticulatus</i> Enderlein	Michoacán, Nuevo León, Puebla, Sinaloa, Tamaulipas
<i>E. intermedia</i> Mockford	Jalisco, Nayarit, (María Madre Is.), Veracruz	<i>Trogium braheicola</i> García Aldrete*	Nuevo León, Puebla, Oaxaca
<i>E. leticiae</i> García Aldrete*	Jalisco, Nayarit, Oaxaca	<i>T. pulsatorium</i> Linnacus	Baja California Sur
<i>E. macgregori</i> García Aldrete*	Jalisco	Family Psoquillidae	
<i>E. madagascariensis</i> Kolbe	Quintana Roo, Tabasco, Veracruz	<i>Psoquilla marginepunctata</i> Hagen	Guerrero, Jalisco, Quintana Roo, Veracruz
<i>E. pacifica</i> García Aldrete*	Chiapas, Guerrero, México, Nayarit (María Madre Is.)	<i>Rhyopsocus bentonae</i> Sommerman	Oaxaca, Veracruz
<i>E. pletschi</i> García Aldrete*	Guerrero.	<i>R. concavus</i> García Aldrete*	Guerrero, Morelos, Oaxaca, Puebla
<i>E. xerica</i> García Aldrete*	Nuevo León.	<i>R. maculosus</i> García Aldrete*	Distrito Federal, Chiapas, México, Michoacán, Nuevo León, Oaxaca
<i>E. yanezi</i> García Aldrete*	Jalisco, Nayarit (María Madre Is.).	<i>R. orthatus</i> Thornton & Woo	Chiapas, Oaxaca
<i>Pteroxanium forcepetus</i> García Aldrete*	Nuevo León.	<i>R. texanus</i> (Banks)	Baja California Sur, Baja California Norte, Chiapas,

Table 3. continued.

Guerrero, Jalisco, Morelos, Nuevo León, Nayarit (María Madre Is.), Puebla, San Luis Potosí, Tamaulipas	<i>P. monticolus</i> García Aldrete*	Distrito Federal, México
	<i>P. neoleonensis</i> García Aldrete*	Nuevo León
<i>Rhyopsoculus mexicanus</i> García Aldrete*Jalisco	<i>P. oculatus</i> Gurney	Jalisco, México, Nuevo León, Oaxaca, Puebla, San Luis Potosí
Group Psocathropetae Family Psyllipsocidae		
<i>Pseudoryteryx mexicanus</i> García Aldrete	Distrito Federal, México, Nuevo León	
<i>Psocathropos microps</i> Enderlein	Chiapas, Jalisco, Socorro Is., Veracruz	
<i>Psyllipsocus chamela</i> García Aldrete*	Jalisco, Yucatán	Chihuahua, Coahuila, Durango, México, Nuevo León, Puebla, San Luis Potosí, Tamaulipas, Veracruz, Yucatán
<i>P. garciamolinai</i> García Aldrete*	Jalisco	
<i>P. hyalinus</i> García Aldrete*	Nuevo León	
<i>P. maculatus</i> García Aldrete*	Nuevo León	
	<i>P. yucatan</i> Gurney*	Yucatán

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