

# **A New Genus and Species of Stiletto-flies from Southwestern North America with Close Affinities to Chilean and Australian Genera**

(Diptera: Therevidae: Therevinae)

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The Therevidae of the Americas are poorly known. Most genera and generic groups have discrete and continuous distribution patterns. *Melanotherewa* Malloch known from two species in Chile and Peru, however, has a disjunct species in Mexico. Another case in point is *Breviperna* Irwin n. gen., mainly from north and central Mexico, which seems to have a close phylogenetic relationship to the Chilean genus *Peralia* Malloch and, to a lesser degree, the Australian and New Zealand genus *Anabarrhynchus* Macquart. I have termed this generic grouping the *Anabarrhynchus*-group. The description of *Breviperna* and its two included species is the purpose of this paper. Elucidation of the genera and their phylogenetic relationships is included in another paper (Irwin and Lyneborg, Mss.).

## **Methods and Procedures**

Each specimen has been assigned a unique number to facilitate the association of data. The number appears below the specimen on a separate yellow label bearing the following words in offset print: THEREVIDAE/M. E. IRWIN/SPECIMEN #. Numbers referring to specimens will be found in the text and figures in italics. These numbers incorporate ecological and label data associated with the specimens into an automated data management system originally designed by Rauch (1970).

Descriptions and drawings follow the format used recently in describing therevid flies (Irwin 1973, 1977; Lyneborg 1972, 1976). Morphological definitions can be found in Lyneborg (1968, 1972), and Irwin (1973, 1976).

Acronyms for specimen depositories are expanded as follows: AMNH (American Museum of Natural History, New York, NY), CIS (California Insect Survey, University of California, Berkeley, CA), CU (Cornell University, Ithaca, NY), KSU (Kansas State University, Manhattan, KS), MEI (M. E. Irwin Collection, Urbana, IL), SWRS (Southwestern Research Station of AMNH, Portal, AZ), UA (University of Arizona, Tucson, AZ), USNM (National Museum of Natural History, Washington, D.C.), UZM (Universitetets Zoologiske Museum, Copenhagen, Denmark).

The curators of the above named depositories are gratefully acknowledged for the loan of specimens. I express my appreciation

to Drs. W. W. Wirth and L. Knutson, USDA/ARS and to Dr. W. Mathis, Smithsonian Institution for making the primary type of *Psilocephala placida* Coq. available for study. I also wish to express my gratitude to Lloyd LeMere for help on the layout of the illustrations, and to John K. Bouseman and Marcos Kogan for reviewing the manuscript. To Bonnie, my wife, I offer my heartfelt thanks for encouragement and her enduring patience.

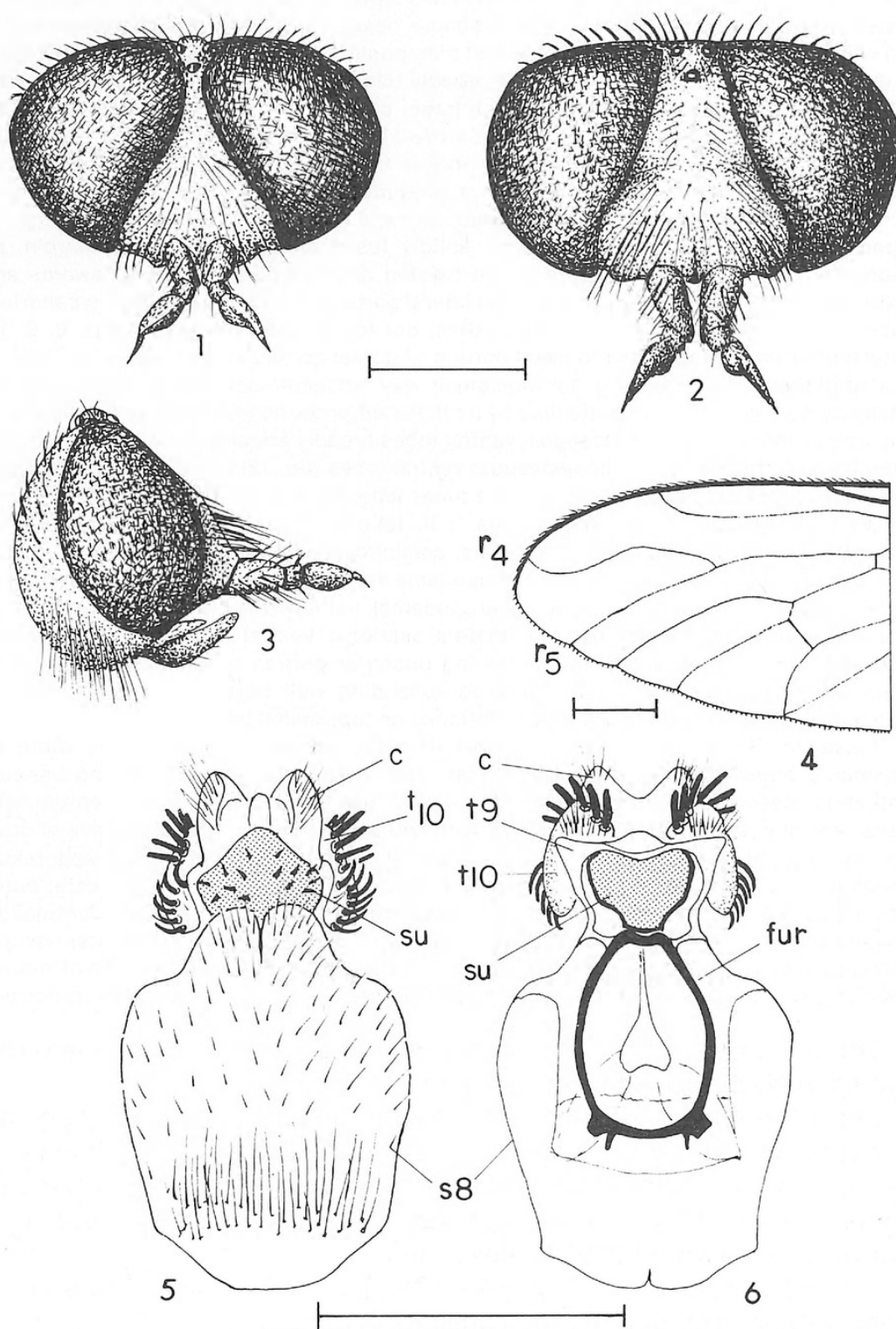
### **Breviperna, new genus**

Derivation of name: *brevi* = short; *perna* = femur; Gender: feminine

Type-species: *B. placida* (Coquillett), herein designated; holotype female in United States National Museum of Natural History, USNM Type no. 10420.

Length excluding antennae 8-13 mm; female slightly larger than male; rather thick-bodied flies. Head: Frons of male (fig. 1) at its narrowest about as wide as anterior ocellus; minimum distance between compound eyes of female at vertex; frons of female (figs. 2, 16) at level of anterior ocellus about twice as wide as ocellar tubercle; head 60-70% as high as wide; facial width at lower corner of compound eyes 60-75% of head height; eyes of uniform facet size, not divided; antennal insertion low, approximately 2/3 distance from vertex to gena; frons at antennal insertion 40-45% as wide as head; gena about 1/3 as deep as width of antennal segment 1; gena slightly flanged and darker tomentose than face; head somewhat prognathus (fig. 3); proboscis extending beyond base of antennae; palps one-segmented, about 60% as long as proboscis, thin and with a sharply incurved tip, sparsely covered with thin hairs; antennae 56-75% as long as head depth; antennal segment 1 70-90% as long as segment 3 (including style), sparsely covered with stiff hairs; dorsobasal surface of segment 3 with a few short, thin hairs, otherwise without pile; style terminal, one- or two-segmented, with a terminal bristle; 20-40 heavy occipital setae per side, in two hemispherical, irregular rows; pile on lower frons moderately thick, on upper frons relatively thin, evenly sparse on male, concentrated on lower frons with two irregular rows of shorter hairs per side on upper frons of female; tomentum fine, powdery, covering entire frons, face, gena and occiput; callosities completely lacking. Thorax: Width 70-80% of length; setae: notopleural (np) usually 4 (from 3-5), supra-alar (sa) always 2, postalar (pa) usually 1 (occasionally 2), dorsocentral (dc) 0 or 1, scutellar (sc) usually 2 (rarely 1 or 3); mesonotal pile sparse, short, thin, over entire surface except scutellum; mesonotal tomentum of two types: long, scale-like tomentum sparse, semi-appressed and pollinose tomentum dense and evenly covering surface; pile sparse to moderately dense on pleurotergite, anepimeron, anepisternum, prosternum and katepisternum; lacking on meropleurite, episternum and epimeron; pile present in central portion of prosternum; pollinose tomentum covering entire pleural region. Wing: Hyaline; cell  $M_3$  open or closed; vein  $r_4$  shallowly "S" curved (fig. 4);  $r_4$  longer than  $r_5$ . Legs: Anterior surface of coxa 1 with two apical setae; posterior surface of coxae 1 and 2 tomentose, not pilose; femora with strong av setae, weak scattered pv setae; femur 1 short; pile on anterior and dorsal surfaces of femur 3 scale-like, appressed; on ventral surface short, sparse, thin; tibia 1 rather stout, straight, with 3-8 strong anterodorsal (ad), 3-8 usually strong posterodorsal (pd), 4-8 strong posteroventral (pv) setae; longest dorsal setae of tibia 1 1.2-1.4 (males) or 1.0-1.1 (females) times longer than greatest width of tibia 1; tibia 3 with 11-19 ad, 6-12 (males) or 9-21 (females) pv setae; setae on hind tarsus about 1/10 as long as basitarsus 3. Abdomen: Broad, nearly parallel-sided from segments 1 through 3, thereafter abdomen tapers sharply; segments 5-8 telescoped within segments 3-4 in males; female segments not telescoped; dorsum of abdomen flattened, more so in males; tergites 1-4 of males variably fasciate; pile moderately sparse, long to short, shortest and





Figs. 1-6. *Breviperna placida*. Figs. 1, 3, male head (4040); Fig. 2, female head (4028). Fig. 4. Tip of wing of female (4028). Figs. 5-6. Female terminalia (4028). Fig. 5, ventral view; Fig. 6, dorsal view. c = cercus; fur = furca (sternite 9); su = subanal plate; s8 = sternite 8; t9 = tergite 9; t10 = tergite 10. Scales = 1 mm.

somewhat appressed dorsomesad, longest and erect anterolaterad; male dorsum densely clothed in silvery tomentum; female dorsum mostly lacking silvery tomentum. Female terminalia: Furca (fig. 6) elongate horseshoe-shaped, ends of horseshoe bridged by a sclerotized bar; subanal plate (fig. 5) with sparse, heavy spines over ventral surface; tergite 10 with nine heavy anterolateral setae and nine posterodorsal pairs of stout spines (figs. 5,6). Male terminalia: Sternite 8 (fig. 13) broadly bilobate; tergite 8 (fig. 14) narrowly constricted medially; epandrium (figs. 7, 10) large, covering most of terminalia, 1.4 times wider than long (bisected medially longitudinally and latitudinally), with outer posterior margins bidentate; cerci (fig. 7) slightly longer than paraproct; paraproct (fig. 11) not keeled; intersegmental membrane basad of paraproct (fig. 11) thinly sclerotized, inverted, shallowly bilobate, attached to base of paraproct and to inner tooth of posterior margin of epandrium; gonocoxites (fig. 12) large, solidly fused along inner ventral margin; an elongate, hindwardly directed projection twisted downward, inward and upwards and extending slightly beyond tip of stylus on lateral portion of each gonocoxite; hypandrium lacking or completely fused to gonocoxites, not identifiable; aedeagus (figs. 8, 9, 15) attached to ventral lobes and to basal portion of dorsal gonocoxal process; distal end of dorsal gonocoxal process (fig. 15) free, small very reduced, knob-like; midbasal portion of dorsal gonocoxal process attached by a thickened, wide, non-sclerotized membrane to the dorsal apodeme of the aedeagus; ventral lobes broadly attached by a non-sclerotized membrane to the center of the aedeagus; ventral lobes (fig. 12) fused basally, elongate; length of aedeagus basad of center three times length distad of center; dorsal apodeme as wide as base of phallus; phallus (figs. 8, 9, 15) curved downward, elongate, with an asymetrically twisted tip; pair of lobe-like, semicircular projections attached to basal, lateroventral portions of phallus; ventral apodeme narrow (less than half as wide as dorsal apodeme), elongate (1.5 x as long as dorsal apodeme), not forked; ring-like remnant of inner dorsal shield (figs. 9, 15) attached to midlateral section of ventral apodeme, circling above and anterior to dorsal apodeme, containing posterior portion of ejaculatory apodeme; ejaculatory apodeme (figs. 8, 9, 15) large, extending well beyond dorsal and ventral apodemes, its anterior end horizontally flattened on top, keeled below.

Diagnosis: Prognathus; compound eyes of male separated by about the width of anterior ocellus; antennae inserted low on head; proboscis reaching beyond base of antennae; mesonotal setae usually np 3 or 4, sa 2, pa 1, dc 0 or 1, sc 2; prosternum with hairs centrally; anterior surface of coxa 1 with two apical setae; posterior surface of coxa 1 tomentose, but not pilose; posterior surface of coxa 2 without pile; male abdominal segments 5-8 telescoped into segments 3-4; sternite 8 of male broadly bilobate; outer posterior margin of epandrium bidentate; gonocoxites fused; hypandrium not identifiable; phallus with asymetrically twisted tip and with two lobe-like projections at lateroventral surfaces of base; ring-shaped inner dorsal shield attached to midlateral section of ventral apodeme and encompassing posterior portion of greatly enlarged ejaculatory apodeme.

The genus *Breviperna* is known from southeastern Arizona and the states of Nayarit, Oaxaca and Puebla, Mexico.

From the sparse information available on the two known species occurring in the genus, it seems likely that individual specimens of *Breviperna* inhabit the deciduous forest environment of mountainous zones. Larvae of *B. milleri* were collected from coarse sand in a narrow canyon above 2000 m elevation.

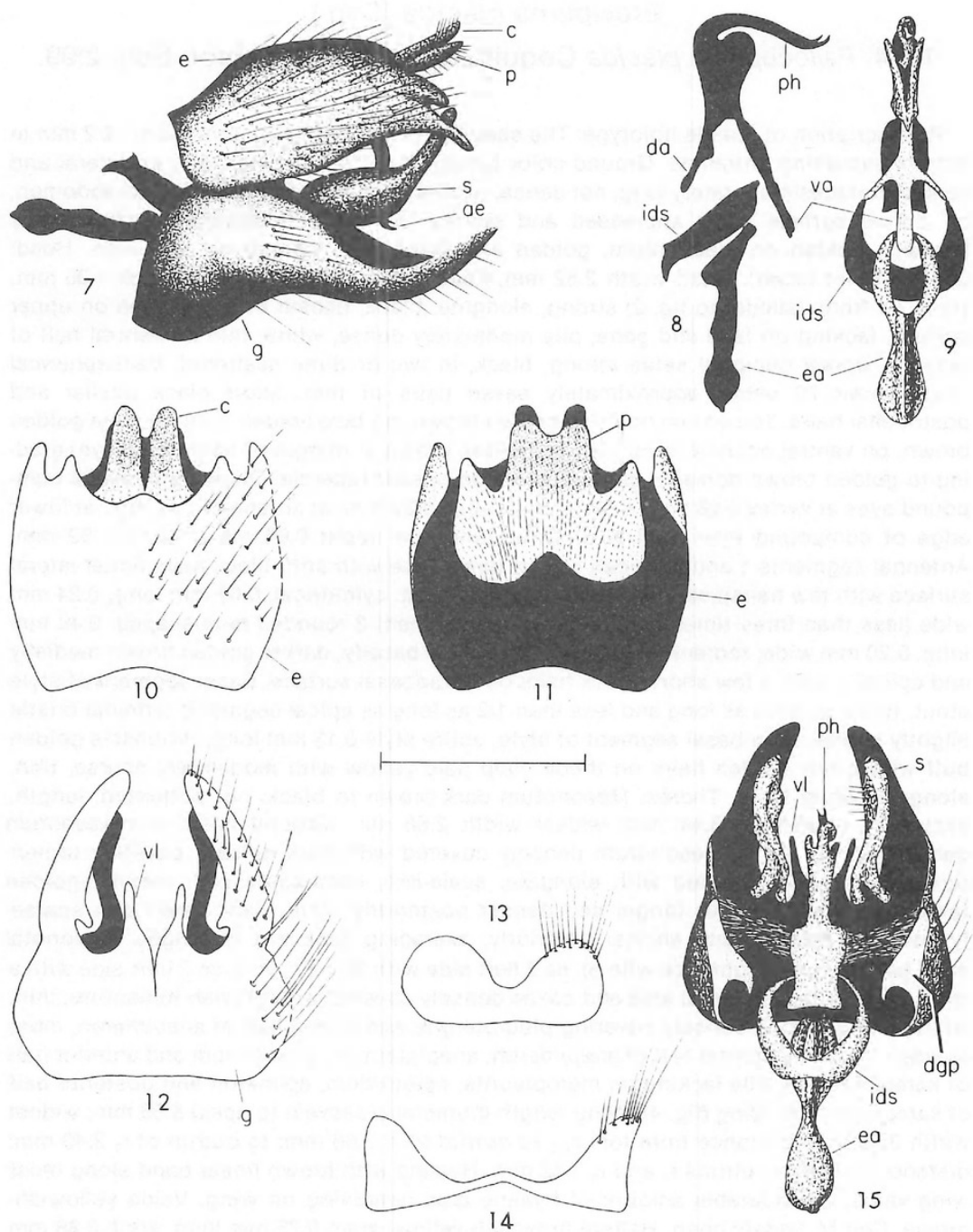
Included species are *B. placida* (Coq.), *B. milleri* Irwin. Material at hand indicates no undescribed species in genus.

*Breviperna* is clearly a member of the *Anabarrhynchus*-group and probably has a sister-group relationship with the genus *Peralia* Malloch. The male terminalia resemble in certain respects those of the genus *Cyclotelus* Walker, but I believe this resemblance may be convergent.



*Breviperna placida* (Coq.)1894. *Psilocephala placida* Coquillett, J. N. Y. Entomol. Soc. 2:99.

Redescription of female holotype: The specimen is in very good condition; 12.2 mm in length, excluding antennae. Ground color brownish-yellow to black; pile on lateral and ventral surfaces moderately long, not dense, whitish on head and thorax, tan on abdomen, on dorsal surface short appressed and sparse; tomentum moderately dense, silver laterally, golden on mesonotum, golden and black, very sparse on abdomen. Head: Ground color brown. Head width 2.52 mm, head height 1.72 mm, head depth 1.36 mm. Hairs on frons (similar to fig. 2) strong, elongate, black, denser on lower than on upper portion, lacking on face and gena; pile moderately dense, white, thin on ventral half of occiput. Dorsal occipital setae strong, black, in two or three scattered, hemispherical rows, about 70 setae; approximately seven pairs of thin, short black ocellar and postocellar hairs. Tomentum on frons golden brown, on face golden buff, on gena golden brown, on ventral occiput silvery white (golden brown at margin of compound eye) grading to golden brown dorsally, golden brown on ocellar tubercle. Distance between compound eyes at vertex 0.28 mm, at anterior ocellus 0.32 mm, at antennae 1.16 mm, at lower edge of compound eyes 1.08 mm. Compound eye depth 0.96 mm, height 1.52 mm. Antennal segments 1 and 2 golden yellow tomentose with stiff, black hairs (inner lateral surface with few hairs); segment 1 barrel-shaped, fat, cylindrical, 0.60 mm long, 0.24 mm wide (less than three times as long as wide); segment 3 rounded pear-shaped, 0.48 mm long, 0.20 mm wide; tomentum light golden yellow basally, darker golden brown medially and apically, with a few short, black hairs on dorsobasal surface. Basal segment of style stout, twice as wide as long and less than 1/2 as long as apical segment; terminal bristle slightly shorter than basal segment of style; entire style 0.13 mm long. Proboscis golden buff with a few golden hairs on theca. Palp pale yellow with moderately sparse, thin, elongate, white hairs. Thorax: Mesonotum dark brown to black, not patterned; length, excluding scutellum, 3.44 mm; widest width 2.68 mm. Ground color of mesonotum dark brown to black. Mesonotum densely covered with dark golden, powdery tomentum and sparsely covered with elongate, scale-like, semi-appressed, metallic-golden tomentum that becomes longer and denser posteriorly. Thin, dark brown pile sparsely covering mesonotum, shorter anteriorly, averaging 0.24 mm in length. Mesonotal setal pattern: np 4 (right side with 5), sa 2 (left side with 3), pa 1, dc 0, sc 2 (left side with a third, smaller seta). Pleural area and coxae densely covered with grayish tomentum; thin, white, elongate pile densely covering pleurotergite and dorsal half of anepimeron, more sparsely covering ventral half of anepimeron, anepisternum, prosternum and anterior half of katepisternum. Pile lacking on meropleurite, episternum, epimeron and posterior half of katepisternum. Wing (fig. 4): Wing length (humeral crossvein to apex) 8.56 mm; widest width 3.20 mm. Distance from fork  $r_{4+5}$  to outrun of  $r_4$  2.68 mm; to outrun of  $r_5$  2.40 mm; distance between outruns  $r_4$  and  $r_5$  1.32 mm. Hyaline with brown linear band along most wing veins; considerable amount of hyaline area remaining on wing. Veins yellowish-brown. Cell  $M_3$  widely open. Haltere brownish-yellow, stem 0.76 mm long, knob 0.68 mm long. Legs: Brownish-yellow, becoming darker apically. Setae black; hairs mostly white on femora 2 and 3, some black on femur 1; setae on tibiae short, tan. Setal pattern: femur 1 ( $f_1$ ) [ad 0, anteroventral (av) 7, pd 0, pv 6], femur 2 ( $f_2$ ) [ad 0, av 4, pd 0, pv 4], femur 3 ( $f_3$ ) [ad 0, av 9, pd 0, pv 21], tibia 1 ( $t_1$ ) [ad 5, av 0, pd 7, pv 5], tibia 2 ( $t_2$ ) [as 7, av 5, pd 7, pv 6], tibia 3 ( $t_3$ ) [ad 15, av 12, pd 12, pv 8]. Femur 1 relatively short, 2.32 mm long, about 1/2 as long as hind tarsus. Largest posterodorsal setae on foretarsus longer than width of foretarsus. Tibia 1, 2.32 mm long; tibia 3, 4.12 mm long; basitarsus 1, 1.08 mm long; basitarsus 3, 1.76 mm long. Abdomen: Ground color dark brown on anterior half of dorsum, yellow to orange brown elsewhere; fasciate on posterior margins of tergites 2 and 3. Pile thin, light tan on segment 1 and tergite 2, black elsewhere; elongate laterally, longest anterolaterad, shortest mid-dorsally, sparse but long ventrally. Tomentum elongate, golden, appressed on segment 1-3, very sparse on rest of abdomen; some gray polinose tomentum on segment 1. Female terminalia: As described in generic description.



Figs. 7-15. Male terminalia of *Breviperna placida* (4040). Fig. 7. Terminalia, lateral view. Fig. 8. Aedeagus, lateral view. Fig. 9. Aedeagus, ventral view. Fig. 10. Epandrium, dorsal view. Fig. 11. Epandrium, ventral view. Fig. 12. Gonocoxites, ventral view. Fig. 13. Sternite 8, ventral view. Fig. 14. Tergite 8, dorsal view. Fig. 15. Gonocoxites, with aedeagus, dorsal view. c = cercus; da = dorsal apodeme of aedeagus; dgp = dorsal gonocoxal process; e = epandrium; ea = ejaculatory apodeme; g = gonocoxite (basistylus); ids = inner dorsal shield of aedeagus; p = paraproct; ph = phallus; s = stylus (dististylus); va = ventral apodeme of aedeagus; vl = ventral lobe of gonocoxite. Scale = 1 mm.



Female variation: Antennal segment 1,  $2/3$  to  $3/4$  as wide as long; wing cell  $M_3$  open or closed, if open distance between outruns of  $m_3$  and  $m_4$  0.13 to 0.35 mm, if closed length of coalesced  $m_{3+4}$  0.00 to 0.05 mm. Most veins with wide band of opaque brown, leaving very little hyaline area. Femoral and tibial setal patterns vary as follows:  $f_1$  [av 4-10, pv 4-8],  $f_2$  [av 2-6, pv 3-9],  $f_3$  [av 8-10, pv 9-22],  $t_1$  [ad 4-7, pd 6-8, pv 5-8],  $t_2$  [ad 4-8, av 3-7, pd 4-7, pv 5-8],  $t_3$  [ad 11-19, av 10-14, pd 8-13, pv 8-21 though most specimens had a portion of a second row of pv setae].

Males similar to females except as follows: minimal distance between compound eyes situated at upper frons, from slightly greater to slightly less than width of anterior ocellus; pile on frons (fig. 1) moderately dense, elongate, black; frontal tomentum usually dark brown to brownish-gold, occasionally grayish (specimens 4039, 4041); specimens from the Chiricahua Mountains have a more abruptly raised frons than those from the Santa Rita Mountains. Mesonotal setal pattern: np usually 4 (3-5), sa always 2, pa usually 1 (1-2), dc usually 1 (0-1), sc usually 2 (1-2). Wing cell  $M_3$  open or closed; if closed length of coalesced  $m_{3+4}$  from 0.00 to 0.05 mm, if open distance between outruns of  $m_3$  and  $m_4$  0.28 to 0.30 mm; femoral and tibial leg setae vary as follows:  $f_1$  [av 5-9, pv 4-8],  $f_2$  [av 2-5, pv 1-1-8],  $f_3$  [av 7-10, pv 4-16],  $t_1$  [ad 5-9, pd 4-8, pv 4-8],  $t_2$  [ad 5-7, av 4-5, pd 5-7, pv 4-7],  $t_3$  [ad 13-19, av 9-13, pd 10-16, pv 6-12 with specimen 4037 possessing a double row totalling 23]; wing hyaline with dark brown linear band around vein  $r_1$ ; abdominal segments 2-4 with a few short, black hairs medially; abdominal ground color black dorsally, brownish yellow ventrally; fasciate on posterior margins of tergites 1-2, slightly on 3; pile thin, white; tomentum silvery, dense dorsally, sparse ventrally, very sparse laterally. Male terminalia (figs. 7-15): As depicted under generic description. Ground color orangish-brown with black hairs. Sternite 8 with long, thin, white hairs along posterior margin; tergite 8 with long, mostly white (a few black) hairs along posterolateral margin; epandrium 1.30 mm wide and 0.93 mm long (measured medially longitudinally and latitudinally), with long, thick, black hairs over most of dorsum, the longest being posterolaterad; outermost tooth of posterior margin of epandrium much larger than innermost, extending to level of apex of cercus; paraproct shallowly bilobate with very thin, brownish-yellow hairs apically, thinly sclerotized; cerci separated for most of their length, united only basally, sclerotized medially and apically with several hairs on dorsal surface, slightly longer than paraproct; gonocoxites large; stylus elongate, blade-like, straight, twisted inward and upward at its tip; basal portion of dorsal gonocoxal process short, squat, with a thickened, inwardly hooked base situated well within gonocoxal capsule. Aedeagus very large; ejaculatory apodeme enlarged, bar-bell shaped, extending from anterior portion of ventral apodeme 0.98 mm anteriorly into abdomen; tip of phallus asymmetrically twisted to the right when viewed from anterodorsal position (fig. 15).

Holotype data: Female, "Florida", H. K. Morrison, collector, according to type notes entered by Coquillett in 1907; a USDA specimen housed in the Smithsonian Institution. Morphologically, this specimen fits well within the limits of the specimens collected from the mountains of Arizona and Mexico, listed below. It seems possible that this specimen originated in Arizona or mountainous Mexico; perhaps it was confiscated by quarantine personnel. The specimen now contains the following labels, from top to bottom: 1) "Fla.", 2) "Type/no. 10420/USNM" [red], 3) "HOLOTYPE/BREVIPERNA/placida/Coq. ♀/det. M. E. IRWIN, 1977", 4) "*Psilocephala placida* Coq./Type" [in Coquillett's hand printing], 5) "USNM", 6) "THEREVIDAE/M.E. IRWIN/Specimen #4051".

Other material examined: 12 males, 12 females. ARIZONA, Santa Cruz Co.; Santa Rita Mts., Madera Canyon, J. G. Franclemont, 1 ♂ (4025 CU) 1700 m, May 8, 1963; 1 ♂ (4026 CU) and 1 ♀ (4028 MEI) 1490 m, May 8, 1963; 1 ♂ (4027 MEI) and 1 ♀ (4029 CU) 1490 m, May 3, 1963; 2 ♀ (4030 CU, 4031 CU) and 2 ♂ (4042 UZM, 4043 MEI) 1490 m, May 14, 1963; 1 ♀ (4032 CU) 1490 m, May 9, 1963. Same locality, 2 ♀ (4033 UA, 4034 UA) May 15, 1960, Laubscher; 1 ♂ (4041 UA) May 8, 1957, G. Butler & F. Werner; 1 ♀ (4049 CIS) 1400 m, June 14, 1965, R. D. Sage; 1 ♀ (4048 MEI) Santa Rita Mts., May 15, 1940, Bryant (Lot 19). PIMA Co.; Santa Catalina Mts., 1 ♀ (4035 UZM) Marshall Gulch, June 20, 1960, F. Werner. COCHISE Co.; Chiricahua Mts., 1 ♂ (4036 KSU) Cave Creek, 1590 m, May 18, 1961, R. H. & E. M. Painter; Southwestern Research Station of the American Museum of Natural History (N.Y.), 8 km

west of Portal, 1650 m, V. Roth, malaise trap, 2 ♂ (4039 SWRS, 4040 MEI) May 28, 1965; 1 ♂ (4038 SWRS) June 5, 1965; 1 ♂ (4037 AMNH) June 7, 1965. Gila Co., Globe, 1 ♀ (4050 USNM), May 14, 1948, F. H. Parker. MEXICO, *Nayarit*; 15 km NW Santa Isabela, 1 ♂ and 1 ♀ (mating) (4052 USNM, 4053 USNM), March 10, 1972, F. D. Parker and D. R. Miller.

To date specimens of *B. placida* have been collected between 1350 and 1700 m above sea level in the mountain ranges of southeastern Arizona and in the Sierra Madre Occidental of Nayarit, Mexico. The species probably occurs throughout the range of the Sierra Madre Occidental and its northern limit is probably southern Arizona.

### ***Breviperna milleri*, new species**

Female holotype (4055), 9.7 mm in length, excluding antennae. Two other females, paratypes (4054, 4056), 9.3 and 9.1 mm long respectively. Ground color black; pile on lateral surfaces generally whitish-gray and moderately long, that on dorsum short, appressed and sparse; tomentum sparse, whitish-gray laterad and ventrad, predominantly brown on mesonotum and head, very sparse on dorsum of abdomen. Head: Width 1.92 mm, height 1.20 mm, depth 1.06 mm. Frons not patterned except for a pair of velvety-brown semicircular spots midway between antennae and ocellar tubercle adjacent to compound eyes; silvery-white tomentose area just below each velvety spot (these barely distinguishable on holotype because face is greasy). Hairs on frons (fig. 16) black, short, sparse on upper frons, rather dense, longer on lower frons, continuing along lateral areas of face; pile white, elongate on face and lower occiput, shorter and black on gena. Dorsal occipital setae thick, black, in two uneven hemispherical rows, about 40 setae; approximately seven pairs of thin, short, black ocellar and post-ocellar hairs. Tomentum on frons sparse, brown, on face whitish, on gena black, on occiput sparse and whitish, on ocellar tubercle brown. Distance between compound eyes at vertex 0.40 mm, at anterior ocellus 0.46 mm, at antennae 1.04 mm, at lower edge of compound eye 1.20 mm. Compound eye depth 0.66 mm, height 1.08 mm. Antennal segments 1 and 2 brown, thinly whitish and golden tomentose with stiff black hairs (inner lateral surface of segment 1 without hairs); segment 1 elongate, thin, curved outward in center, 0.44 mm long, 0.14 mm wide (more than three times as long as wide); segment 3 elongate pear-shaped, 0.38 mm long, 0.14 mm wide; tomentum dark brown basally, more golden apically, with several short, black hairs on dorsobasal surface. Style apparently one segmented with an elongate terminal bristle. Proboscis and palp black with sparse brown tomentum. Thorax: Mesonotum patterned, brown tomentose with a pair of silvery-gray tomentose stripes and a pair of silvery-gray patches covering area of sa and pa setae, also covering scutellum; mesonotum sparsely covered with metallic golden, appressed, scale-like tomentum and sparse, black pile. Mesonotal setal pattern: np 3, sa 2, pa 1, dc 0, sc 2. Pleural area and coxae densely covered with grayish tomentum; thin, white, elongate pile densely covering same areas as on *B. placida*. Wing: Wing length (humeral crossvein to apex) 5.34 mm, widest width 2.30 mm. Distance from fork  $r_{4+5}$  to outrun of  $r_4$  1.64 mm, to outrun of  $r_5$  1.56 mm; distance between outruns  $r_4$  and  $r_5$  0.76 mm. Hyaline with light brown patch near outrun of  $r_1$ . Veins medium brown. Cell  $M_3$  closed with a coalesced  $m_{3+4}$  0.12 mm long. Haltere dark brown, stem 0.52 mm long, knob 0.54 mm long. Legs: Femora black, tibiae yellowish-brown. Setae black; femora with whitish pile and appressed scale-like whitish hairs; setulae on tibiae short, black. Setal pattern:  $f_1$  [ad 0, av 1-2, pd 0, pv 0],  $f_2$  [ad 0, av 0, pd 0, pv 0-1],  $f_3$  [ad 0, av 4-5, pd 0, pv 5-6],  $t_1$  [ad 3-5, av 0, pd 3-6, pv 4-6],  $t_2$  [ad 4-5, av 2-3, pd 4-5, pv 4-5],  $t_3$  [ad 12-14, av 7-10, pd 7-8, pv 9-11]. Femur 1 relatively short, 0.77-0.81 mm long, about 2/3 as long as femur 3 and about 1/2 as long as hind tarsus. Longest postero-dorsal seta on foretarsus longer than width of foretarsus. Tibia 1, 1.66 mm long; tibia 3,



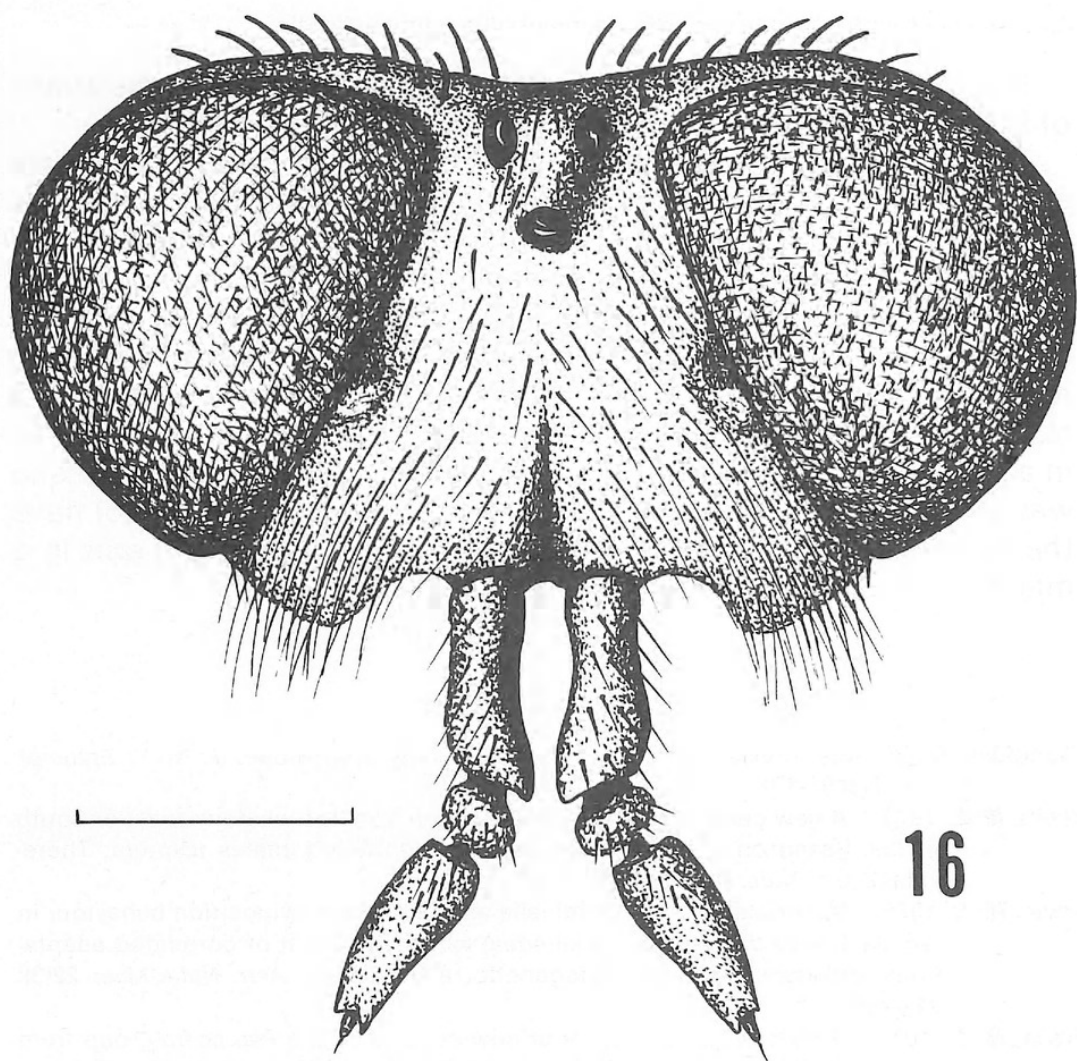


Fig. 16. Head of *Breviperna milleri*, female (4056), frontal view. Scale = 0.5 mm.

3.06 mm long; basitarsus 1, 0.74 mm long; basitarsus 3, 1.16 mm long. Abdomen: Ground color black; fasciate on posterior margins of tergites 2 and 3. Pile relatively long, dense on lateral margins of tergite 1, sparse elsewhere, whitish on segments 1 and 2, black elsewhere. Thin silvery tomentum on segment 1, thinner on 2. A pair of silvery tomentose patches laterally on tergites 4 and 5. Female terminalia: See generic description.

Male: Unknown.

Material examined: 3 females. MEXICO, *Puebla*, 8 km S. Tecomachalco, 2100 m, August 10, 1967, collected as larva in narrow canyon, M. E. Irwin (with last larval exuvium and pupal exuvium) (holotype female, 4055 MEI; paratype female, 4056 temporarily kept in the collection of MEI). *Oaxaca*, 17 1/2 km N of Miltipepec, March 3, 1972, F. D. Parker and D. R. Miller (paratype female, 4054 USNM).

Derivation of name: Named in honor of Douglass R. Miller, lifelong friend and colleague.

Diagnosis: This species is smaller than *B. placida*, darker in color and can easily be distinguished by the following combination of characters: frons with a dark velvety brown spot contiguous with each compound eye (fig. 16), lateral portion of face with elongate whitish (and some black) pile, antennal segment 1 much thinner (3 times as long as wide), and

antennal style with only one apparent segment plus terminal bristle.

To date specimens of *B. milleri* have been collected from the states of Puebla and Oaxaca, Mexico, at an elevation of over 2000 m.

Two larvae of *B. milleri* were sieved from a coarse sandy substrate along the side of a narrow canyon on August 10, 1967. They were reared in the laboratory at the University of California, Riverside, CA on a diet of *Tribolium confusum* larvae. They pupated on January 14, 1967 (4056) and January 16, 1967 (4055). Dates of eclosion were not recorded, but on the average this subfamily of therevids emerges 10 to 14 days after pupal initiation. One specimen (4055) was kept alive as an adult for several days. She was fed sugar water and maintained in a glass-sided terrarium with a sand substrate. During the time she was alive and active she laid 39 eggs, even though she did not have the opportunity to mate. These eggs are preserved in glycerin in a microvile attached to the pin of specimen 4055.

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