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(HYMENOPTERA: COLLETIDAE)

By Roy R. Snelling



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THE BEE GENUS *BICORNELIA* (HYMENOPTERA: COLLETIDAE)¹

By Roy R. Snelling²

ABSTRACT. The diphaglossine genus *Bicornelia* was described by Friese in 1899 from two males from Mexico and has remained essentially unknown since then. The genus is redescribed from recently collected material that includes males of the type species, *B. serrata*, from Mexico and both sexes of a newly described species, *B. inusitata*, from Panama. Pertinent structures of both species are illustrated.

The genus *Bicornelia* was proposed by Friese (1899) for a new species, *B. serrata*, based on two males from "Tuzantlu Laurel," Mexico, collected by Bilimek. It was placed near *Caupolicana* from which it differs in details of wing venation and in the modifications of the legs. *Bicornelia* has remained unstudied and known only from the types, which have not been seen by recent workers. Michener (1966) included it in the tribe Mydrosomini on the basis of the original description and its presumed relationship to *Mydrosoma*. Several males of *B. serrata* are now available, as well as both sexes of an undescribed Panamanian species. The following generic description is patterned after those of Michener (1966) to facilitate comparison with other diphaglossine genera.

SYSTEMATICS

Bicornelia FRIESE

DIAGNOSIS. Diphaglossinae, Mydrosomini. **MALE:** Apical segments of flagellum strongly serrate beneath; mid trochanter with lamelliform apical spine; hind femur moderately to strongly swollen; hind tibia strongly swollen or moderately swollen and with median tubercle at midlength. **FEMALE:** Flocculus of hind femur absent from dorsal face, hairs sparse on anterior and ventral faces, the longer hairs plumose apically only; inner hind tibial spur finely, evenly serrate.

DESCRIPTION. (1) Clypeus evenly convex, weakly elevated above adjacent parts of face, not continuous with supra-clypeal area in profile. Clypeoantennal distance in female slightly greater than diameter of antennal socket. (2) Prestigma about twice as long as stigma; marginal cell not prolonged basally as a narrow sinus to apex of stigma. (3) Hind basitarsus of female a little more than twice longer than wide; second hind tarsal segment of female expanded, but a little longer than wide, third much narrower than second. (4) Outer hind tibial spur of male normal, articulated at base like inner spur. (5) Abdomen without metallic tints, or with extremely

weak bluish to greenish tints basally on terga (*B. inusitata*). (6) Lateral extremities of terga of male without areas of short, dense erect hair. (7) Sixth sternum of male with posterior margin neither thickened nor sulcate. (8) Seventh sternum of male with complex paired lobes. (9) Eighth sternum of male uniformly and moderately pigmented, median process down-curved, longest hairs of distal half shorter than width of process. (10) Gonoforceps swollen apically, truncate.

The only other genus in the tribe Mydrosomini is *Mydrosoma* F. Smith (1879), which I have not seen. The flagellum of male *Mydrosoma* is simple, not serrate beneath as in *Bicornelia*. Neither Smith's description of *Mydrosoma*, nor Moure's (1945) description of the synonymous *Dissoglotta*, mention the presence of a spine on the mid trochanter. However, the transparent, lamelliform spine present in *Bicornelia* is easily overlooked, and it is possible that such a spine may also be present in males of *Mydrosoma*. The very superficial description of the female of *M. metallicum* is not very helpful. The metasomal dorsum is stated to have a metallic green luster. Apparently, also, the first recurrent vein of the forewing is interstitial with Rs. These differences are weak; it may be that, when more material is available, *Bicornelia* will prove to be a synonym of *Mydrosoma*.

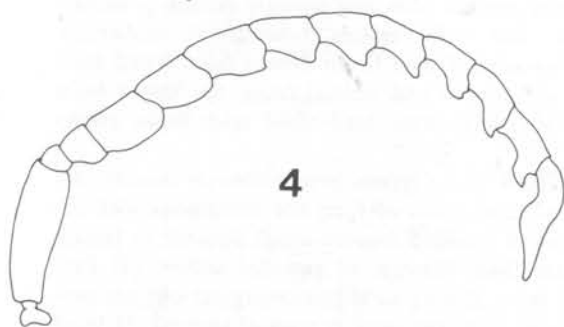
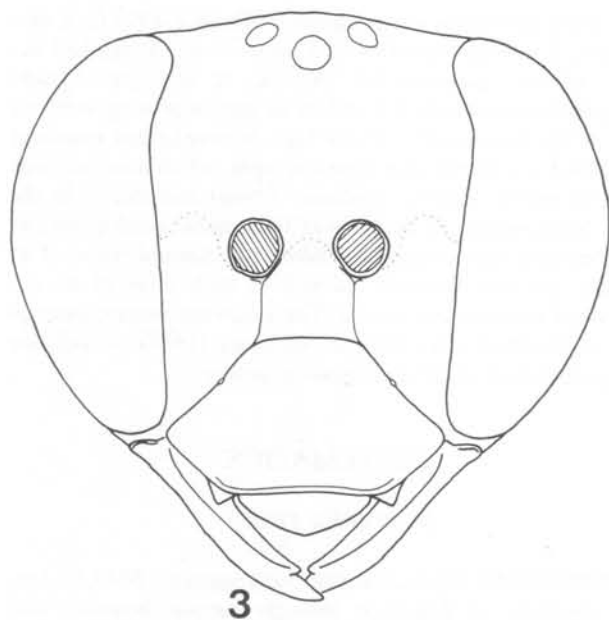
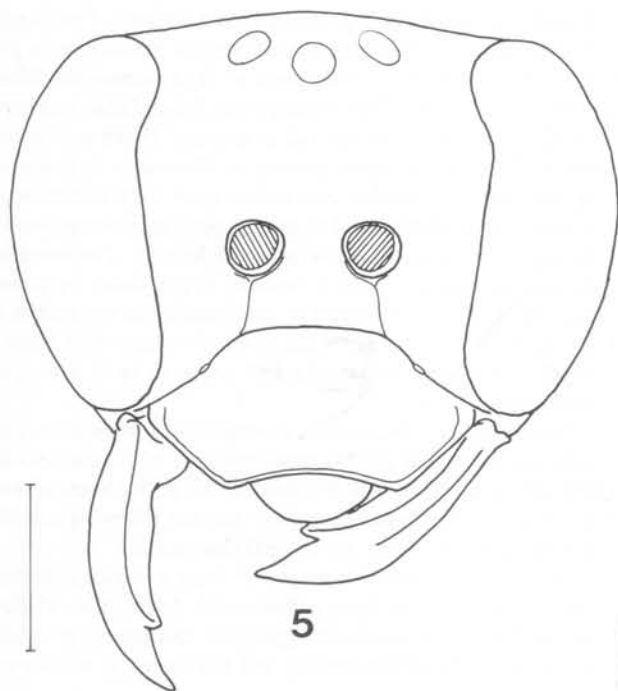
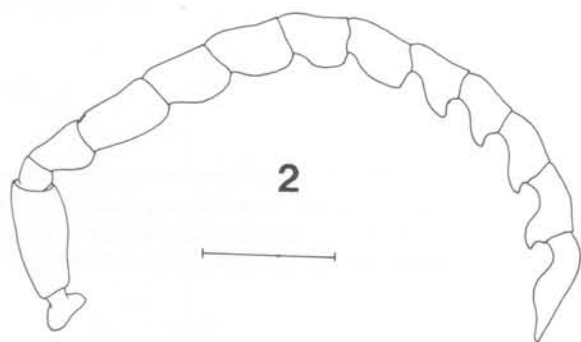
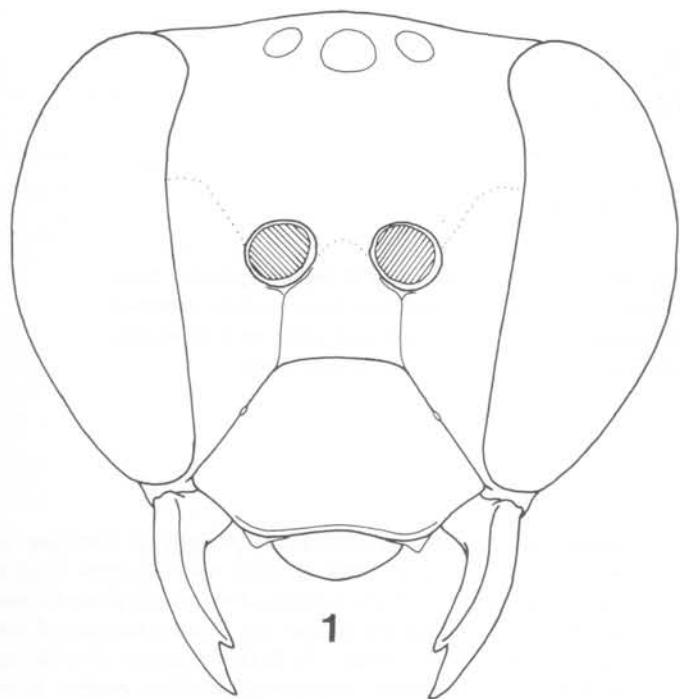
Subsequent to the original description of *Bicornelia* and its type species, Friese (1925) described four additional species in this genus, all from South America. As no material of any of these species has been available to me, the following comments are based wholly upon the original descriptions.

Bicornelia sericata was described from a female collected at Guayaquil, Ecuador, by von Buchwald, April 1923, at flowers of *Cucurbita*. The specimen apparently resembles the female of *B. inusitata* (described below), but the thorax is weakly punc-

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Figures 1 through 5. Head and antennae, *Bicornelia* species. Figure 1, *B. serrata* male, head, frontal view. Figure 2, *B. serrata* male, antenna. Figure 3, *B. inusitata* male, head, frontal view. Figure 4, *B. inusitata* male, antenna. Figure 5, *B. inusitata* female, head, frontal view. Scale lines: Figures 2 and 4, 1.00 mm; Figures 1, 3, and 5, 0.50 mm.

tate, the first flagellar segment is equal to the second, and the first abdominal segment is shinier than the second.

Bicornelia aterrima was described from a female from Tarata, Bolivia, collected by Priewasser. This bee, if correctly placed in *Bicornelia*, may be recognized by the coarsely sculptured abdomen, the dark wings and pilosity, and the short, dense, plumose (?) hairs covering the gastric terga.

Bicornelia andina was described from males from Sierra Parime, Venezuela, and Tarata, Bolivia; the type locality is here restricted to Sierra Parime. Although Friese stated that this is a typical *Bicornelia*, the flagellum is described as simple and the abdomen almost nude. If this is truly a *Bicornelia* (not *Myrdrosoma* ?), these features will render it easily recognized. The legs are apparently not much modified.

Bicornelia longitarsis was described from one male from Blumenau, Brazil. It is said to be similar to *B. serrata* but with the abdomen black, with weak bluish reflections and with broad bands of appressed hairs on the first four segments.

Nothing is known of the biology of *Bicornelia*. The yellowish color and enlarged ocelli of the two species studied suggest that these species are crepuscular, nocturnal, or matinal. The three specimens of *B. serrata* collected near Tequila were taken in the evening.

Floral preferences are unknown. The type of *B. sericata* was collected at flowers of *Cucurbita*. Pollen grains from males taken in Mexico are apparently congeneric with those from pollen loads removed from females from Panama. These have not been identified but apparently are of a legume.

The heads and antennae of *B. serrata* and *B. inusitata*, new species, are shown in Figures 1 through 5. Legs and sternum segments of both species are illustrated in Figures 6 through 11, and genital capsules are compared in Figures 12 and 13.

Bicornelia serrata FRIESE

Figures 1 and 2, 10 through 12

DIAGNOSIS. MALE. Flagellar segments 7–10 serrate beneath; hind femur without transverse lamella beneath in middle; hind tibia swollen but without median tubercle anteriorly. FEMALE. Unknown.

DESCRIPTION: Measurements (in millimeters) are as follows: Head length (HL), 3.18–3.28; head width (HW), 3.85–4.10; wing length (WL), 10.6–11.2; total length (TL, head + thorax + terga 1 and 2), 12.2–13.0.

(1) Inner eye margin sinuate; lower interocular distance 0.88 to 0.92 times greatest interocular distance. Ocelli large; interocellar distance almost twice diameter of anterior ocellus; ocellular distance a little greater than diameter of anterior ocellus; ocelloccipital distance about equal to diameter of anterior ocellus. (2) Extreme basal part of labrum with one or two weak transverse ridges. (3) First flagellar segment less than half as long as scape, about half as long as following segment; flagellar segments 1–6 strongly bulging beneath, segments 7–10 serrate beneath; apical segment a little longer than second flagellar segment, apex pointed, with low median convexity beneath (Fig. 2). (4) Anterior femur, seen from above, about twice longer than thick. Middle trochanter beneath with a thin, apical, transparent spine which is about half as long as greatest thickness of trochanter. Middle femur distinctly flattened beneath and about 2.7 times longer than thick. (5) Hind femur, in

dorsal view, about twice as long as it is thick, ventral surface slightly concave. Hind tibia in lateral view much broadened over lower half, length about 2.9 times apical width. (6) Hind basitarsus about three-fourths as long as hind tibia, about four times longer than it is wide, widest beyond middle, narrowed somewhat toward apex. (7) Propodeal triangle without transverse ridges. (8) Posterior margins of sterna 2–4 transverse; sternum 5 evenly and shallowly concave on posterior margin. (9) Apical margin of sternum 6 weakly convex; disc with a low, shiny prominence on either side of middle at about mid length. (10) Hidden sterna and genitalia shown in Figures 10 through 12. (11) Integument of head black; pale yellowish color on basal two-thirds of mandible, labrum, clypeus, supraclypeal area, side of face to slightly above level of upper margin of antennal socket, lower genal and hypostomal area. Antenna pale ferruginous, with blackish blotches on outer side of flagellar segments 2–7. Thorax black. Legs, tegula, and abdomen reddish yellow; abdomen with sublateral brownish marks on basal face of first tergum and dorsally at about mid length on terga 1–5; tergum 6 with transverse, preapical brownish fascia, which is strongly curved cephalad in middle to join median longitudinal bar; tergum 2 with small lateral spot; tergum 7 mostly brownish; with medioapical yellowish spot. Sterna mostly reddish yellow, but with large, transverse, median brownish blotches. Wings light yellowish brown, slightly darker beyond cells; veins and stigma darker yellowish brown. (12) Pubescence abundant, yellowish, paler on sides and venter. Hairs of tergum 1 long, plumose, erect; remainder of terga with subdecumbent, shorter, simple reddish yellow hairs which become longer caudad. Sterna 2–4 with abundant suberect to erect, long, weakly plumose, yellowish hairs, discs with scattered appressed, simple, short hairs; sternum 5 with conspicuous apicolateral tufts of erect, reddish, simple hairs; sternum 6 with patches of sparse, simple, subappressed to suberect yellowish hairs and a weak row across apical margin; sterna 2–5 with marginal fringe of very short, widely spaced, whitish hairs.

TYPE MATERIAL. "2♂♂ im Mus. Wein von Mexico (Bilimek 1871, Tuzantlu Laurel)." This may be the village of Tuzantla, Michoacan, situated about 48 km SSW of Zitacuaro. The types have not been studied.

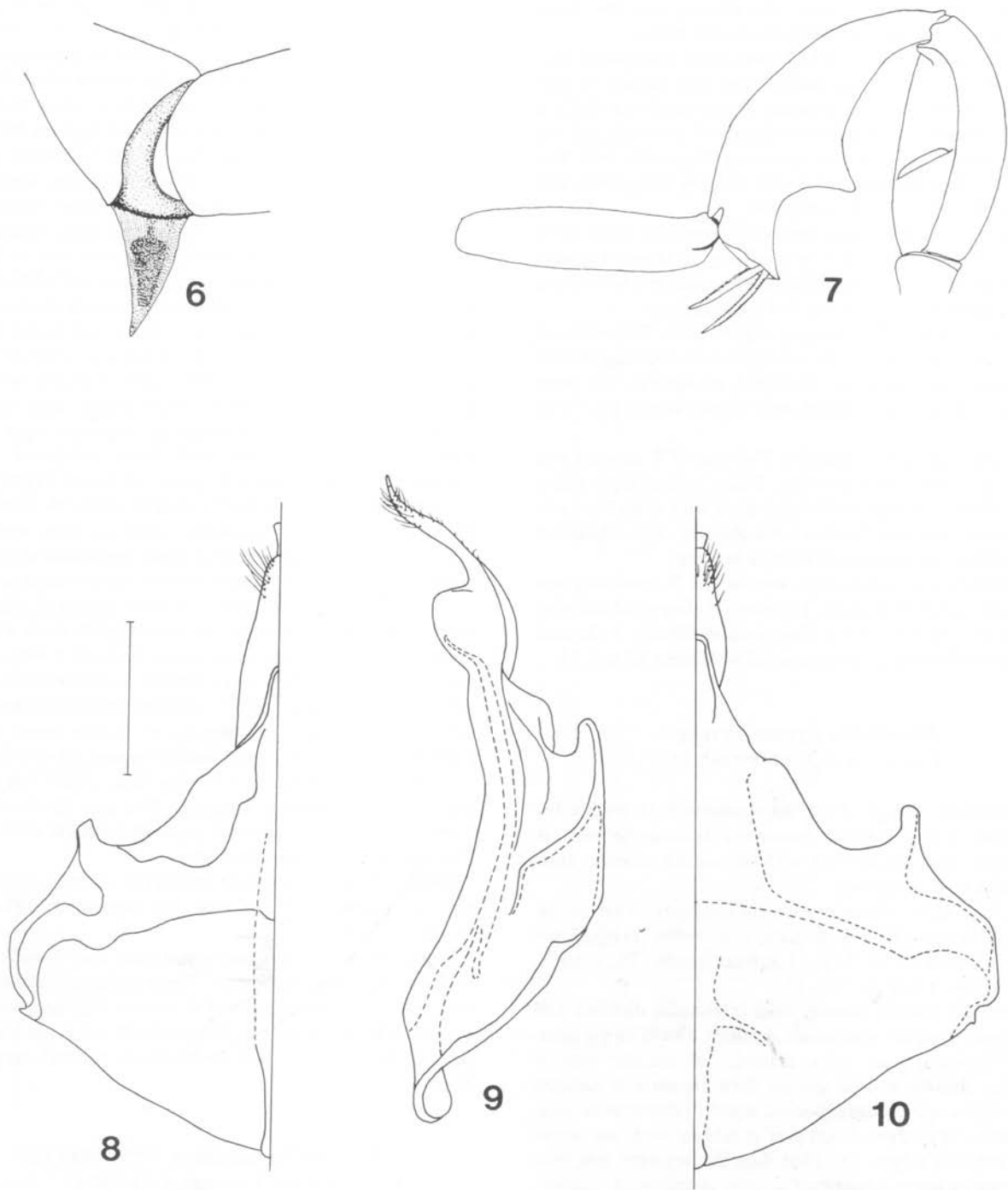
SPECIMENS STUDIED. MEXICO, Jalisco: 3♂♂, 7 km NW of Tequila, 1275 m elev., 10 September 1974 (E.M. Fisher; LACM).

DISCUSSION. The three males from near Tequila are the basis for the above description. These males correspond closely with the original description of *B. serrata*. The bees were taken at dusk flying about plants. The yellowish color and large ocelli suggest the possibility that the species is matinal, crepuscular, or both.

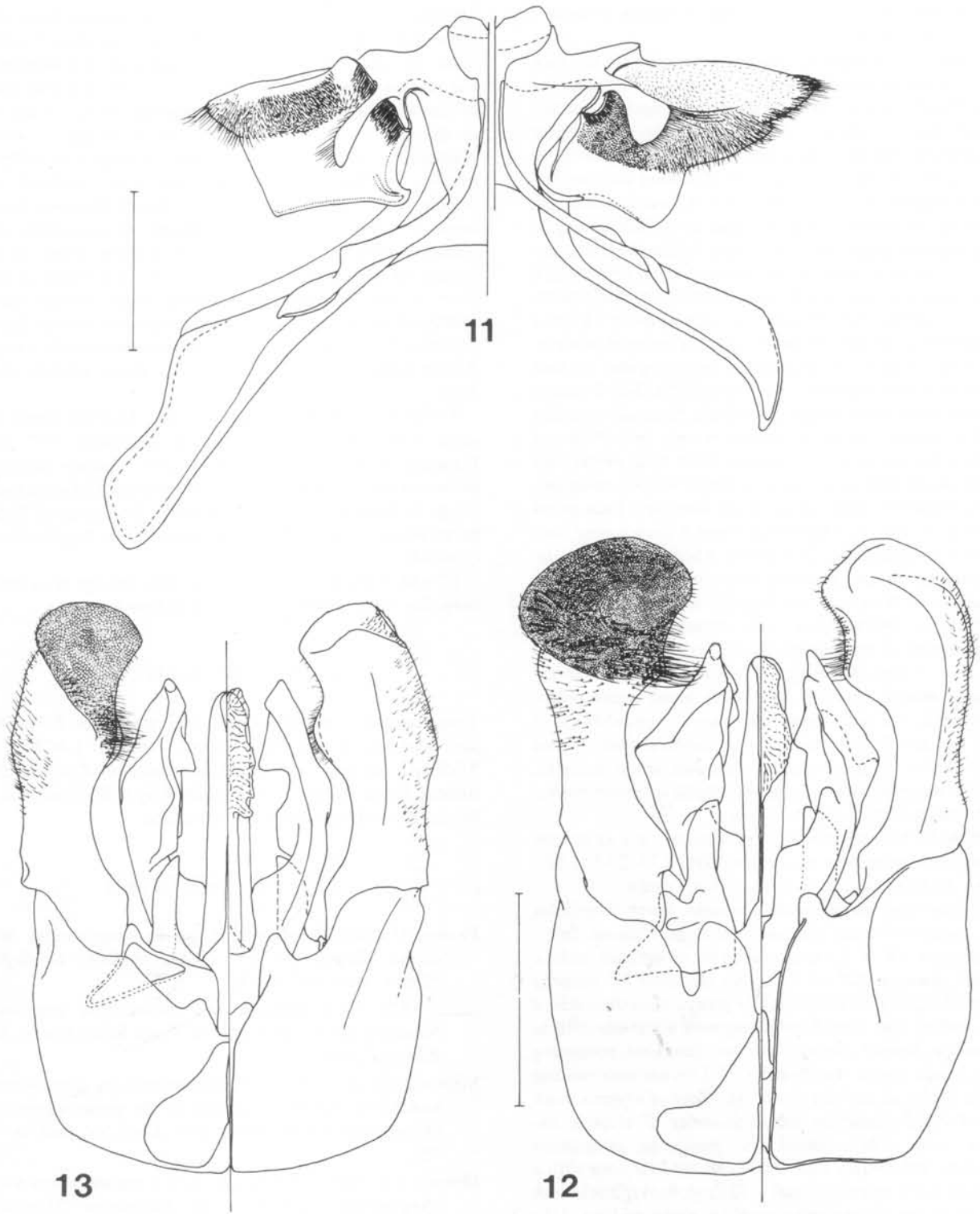
Bicornelia inusitata, NEW SPECIES

Figures 3 through 9, 11 and 13

DIAGNOSIS. MALE. Flagellar segments 5–10 serrate beneath; hind femur with transverse lamella beneath in middle; hind tibia with conspicuous tubercle on anterior margin a little beyond middle. FEMALE. Scutum and scutellum with scattered fuscous hairs; hairs of scopa mostly dark brownish; metasoma mostly brownish; anterior width of second and third submarginal cells subequal.



Figures 6 through 10. Legs and sternites of males of *Bicornelia* species. Figure 6, *B. inusitata*, apex of mesotrochanter. Figure 7, *B. inusitata*, metafemur, metatibia, and metabasitarsus. Figure 8, *B. inusitata*, sternum 8, left half. Figure 9, *B. inusitata*, sternum 8, lateral view. Figure 10, *B. serrata*, sternum 8, right half. Scale line, Figures 8 through 10, 0.50 mm.



Figures 11 through 13. Sternum 7 and genital capsules of males of *Bicornelia* species. Figure 11, Sternum 7 of *B. serrata* (left) and *B. inusitata* (right). Figure 12, *B. serrata* genital capsule, ventral (left) and dorsal (right) views. Figure 13, *B. inusitata* genital capsule, ventral (left) and dorsal (right) views. Scale lines: Figure 11, 0.50 mm; Figures 12 and 13, 1.00 mm.

DESCRIPTION.

MALE. Measurements (in millimeters) are as follows (values in parentheses refer to holotype): HL, 2.87; HW, 3.49–3.59 (3.49); WL, 9.5–9.7 (9.5); TL (HL + thorax + terga 1 and 2), 9.9–10.1 (9.9).

(1) Inner eye margin sinuate; lower interocular distance about 0.90 times greatest interocular distance. Ocelli large; interocellar distance 1.9 to 2.0 times diameter of anterior ocellus; ocellocular distance about 1.5 times diameter of anterior ocellus; ocelloccipital distance a little greater than diameter of anterior ocellus. (2) Extreme basal part of labrum with two distinct, short transverse ridges in middle. (3) First flagellar segment less than one-fifth as long as scape, about half as long as following segment; segments 1–4 strongly bulging beneath, segments 5–10 serrate beneath; apical segment about twice length of second segment, strongly bulging beneath, profile sinuate (Fig. 4). (4) Anterior femur, seen from above, about 2.8 times longer than thick. Middle trochanter (Fig. 6) flattened beneath, apically with a thin, broad, transparent projection that is about as long as maximum thickness of trochanter. (5) Hind femur, in dorsal view, about twice longer than thick, flattened ventrally, with a low, weakly convex, transverse lamella in middle and preapical, flattened, spiniform process. Hind tibia moderately expanded toward apex in lateral view, length about 3 times apical width; anteriorly with a large, blunt tubercle a little below middle (Fig. 7). (6) Hind basitarsus about 5 times longer than wide, widest in basal third. (7, 8 and 9) About as in *B. serrata*. (10) Hidden sterna and genitalia shown in Figs. 8, 9, 11, 13. (11) Head as in *B. serrata* but flagellar segments 2–10 dark brownish above. Thorax black, with extremely faint greenish reflection on side of propodeum. Coxae, trochanters, and hind femur light brownish, remainder of legs reddish yellow. Metasomal terga mostly brownish, with faint bluish green reflections, segments 1–5 with broad, transparent, yellowish apical margins, tergum 7 with medioapical reddish spot. Sterna mostly brownish, with translucent yellowish apical margins. Wings light brownish yellow, veins and stigma yellowish brown. (12) Pubescence about as in *B. serrata*.

FEMALE. Measurements (in millimeters) are as follows (values in parentheses refer to allotype): HL, 2.77–2.92 (2.92); HW, 3.61–3.64 (3.64); WL, 8.7; TL, 9.8–9.9 (9.9).

(13) Inner eye margin weakly sinuate, lower interocular distance about 0.90 times greatest interocular distance. Interocellar distance 1.8 to 2.1 times diameter of anterior ocellus; ocellocular distance 1.8 to 1.9 times diameter of anterior ocellus; ocelloccipital distance slightly greater than diameter of anterior ocellus. (14) First flagellar segment about one-fifth as long as scape. Second segment broader than long, remaining segments a little longer than broad. (15) Labrum with two fine transverse ridges at extreme base. (16) Base of clypeus more finely and closely punctate than remainder of clypeus; supra-clypeal area with scattered fine punctures; integument slightly shiny and sharply tessellate. (17) Anterior coxa with a short, blunt, hairy apical process. (18) Propodeal triangle with very weak traces of transverse wrinkles along midline. (19) Head and thorax blackish brown, side of propodeum with extremely faint greenish reflections, middle of mandible reddish; underside of flagellum yellowish. Legs brown, tibial spurs yellowish, tarsal claws red. Metasoma brown, terga 1–4 with translucent yellowish apical bands, wider in middle; sterna

paler brown than terga, with narrow translucent apical bands on segments 2–5. Wings clear, brownish, darker beyond cell area, veins and stigma brown. (20) Hairs on head mostly whitish, some yellowish hairs apically on clypeus, hairs of occiput dusky. Hairs of thoracic dorsum dark ochreous, becoming paler, whitish, beneath; mesoscutum and scutellum with numerous fuscous hairs. Hairs white on femora and anterior margin of hind tibia and hind basitarsus; remainder of hair of legs light to dark brown. Hairs of basal face of tergum 1 whitish, plumose; on summit of tergum 1 and on terga 2–4, yellowish, simple, appressed to subdecumbent, with scattered erect fuscous hairs, terga 5–6 with hairs suberect, plumose, fuscous; terga 1–4 with narrow apical fringe of appressed, short, plumose, whitish hairs, tergum 5 with dense fringe of long, coarse, apically branched, yellowish red hairs. Hairs of sterna short at base of segment, becoming longer toward margin; mostly whitish to yellowish, but with numerous fuscous hairs on segments 4–6, hairs simple mesially, plumose laterad; sterna 2–5 with weak marginal fringe of very short, whitish, simple hairs.

TYPE MATERIAL. Holotype male, Madden Forest Preserve, Canal Zone, PANAMA, 12 December 1957 (W.J. Hanson). Allotype female, 1 male and 1 female paratypes, same locality, 1 January 1958 (W.J. Hanson). Holotype and allotype in Snow Entomological Museum, University of Kansas; paratypes in Natural History Museum of Los Angeles County (LACM).

ETYMOLOGY. From Latin, *inusitata*, strange or extraordinary, due to the modified antenna and hind leg.

ACKNOWLEDGMENTS

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