

## TWO NEW NEOTROPICAL GENERA OF EMBIIDAE (EMBIOPTERA, INSECTA)

CLAUDIA A. SZUMIK

Instituto Superior de Entomología, Facultad de Ciencias Naturales e Instituto Miguel Lillo  
Universidad Nacional de Tucumán, Miguel Lillo 205,  
C.P. 4000 S.M. de Tucumán, Argentina.

**Abstract.**—Two new genera of Embiidae, *Gibocercus* and *Biguembia*, are described. *Gibocercus* and *Biguembia* contain four and two species, respectively, all newly described: *G. chaco* (Argentina), *G. beni* (Bolivia), *G. urucumi* (Brasil), *G. nanai* (Perú), *B. copo* (Argentina) and *B. cocum* (Brasil). The new genera form a monophyletic group and they are the sister group of *Parhagadochir* plus *Scelembia*; the four genera share, among other characters, a node on the left paraproct and a bifid process on the 10th left hemitergite. The relationships of the new genera, and their species, are discussed.

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As currently delimited, Embiidae is one of the largest families of Embioptera, with representatives in all continents except Australia, including 117 species (only 28 of which are from the Neotropical region).

Davis (1940) suggested that Embiidae was a polyphyletic group, defined on the basis of convergences. A preliminary cladistic analysis of the higher classification of the order (Szumik, 1996) supported Davis' idea.

A more detailed (and unpublished) analysis of the order, with many more characters and taxa (including 104 characters and 90 species of 40 genera, with a better representation of Neotropical taxa), allows recognition of two new genera, *Gibocercus* and *Biguembia*, in the polyphyletic "Embiidae." In this new analysis the neotropical Embiidae (except *Microembia*) and *Scelembia* form a monophyletic group, which in turn is the sister group of Oligotomidae and Teratembidae (Fig. 1). *Gibocercus* and *Biguembia* appear as the sister group of *Pararhagadochir* and *Scelembia* (Embiidae from South America and Africa, respectively); this is suggested by similarities in mandibular, alar and abdominal characters. These four genera share at least four synapomorphies: 1) cross-veins absent between Ma and Mp veins; 2) Rs+Ma forking from Cu, and a cross-vein between R1 and Rs+Ma; 3) a bifid process of the left hemitergite; and 4) the left paraproct with a nodule and denticles. *Gibocercus* and *Biguembia* were represented in this new analysis by their six constituent species, and both resulted as well supported monophyletic groups (Fig. 1). A full discussion of the entire analysis is beyond the scope of this paper; only the results relevant for the relationships of *Gibocercus* and *Biguembia* are included below.

### MATERIAL AND METHODS

The material used here was available as a courtesy of John E. Rawlins, Carnegie Museum of Natural History, Pittsburgh (CMNH); Abraham Willink, Instituto-Fundación Miguel Lillo, Tucumán (IFML); Stefan P. Cover, Museum of Comparative

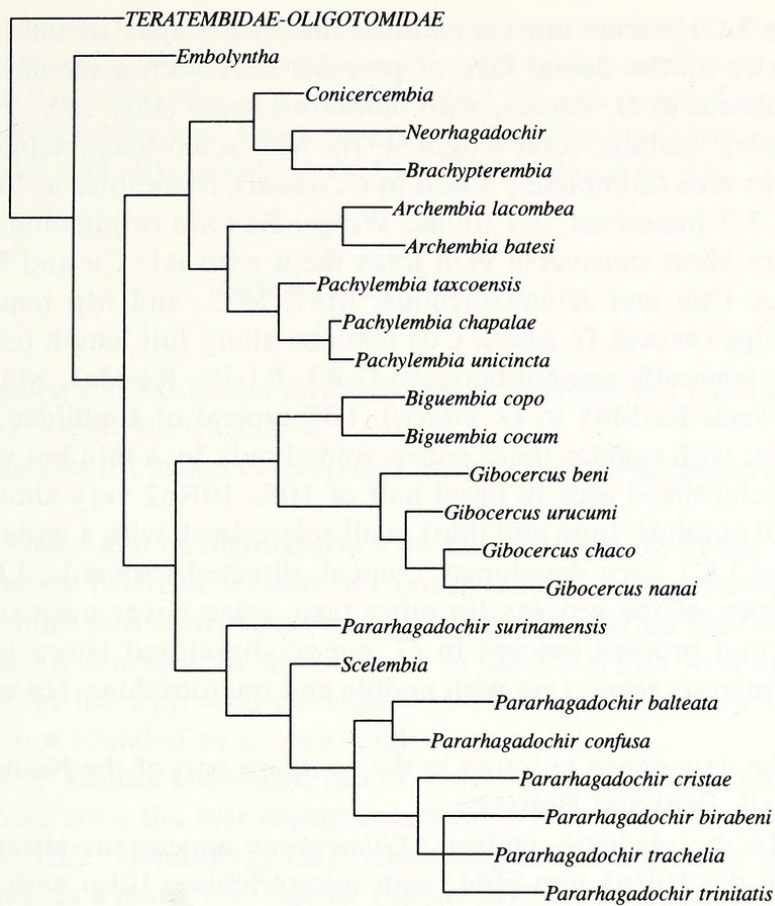


Fig. 1. Partial Cladogram (showing the relationships of Neotropical Embiidae) from the most parsimonious tree (104 characters scored for 90 Embioptera).

Zoology, Cambridge (MCZ); Alcide Costa and Ricardo Pinto da Rocha, Museu de Zoologia, São Paulo (MZSP); David A. Nickle, United States National Museum of Natural History, Washington (USNM).

All measurements are given in millimeters. Ocular ratio is defined in Szumik (1991). The abbreviations used are: Mm, mentum; Sm, submentum; 10T, tenth tergite; 10L, tenth left hemitergite; 10R, tenth right hemitergite; 10Lp, process of the left hemitergite; 10Rp1, posterior process of the 10R; 10Rp2, anterior process of the 10R; H, hypandrium or ninth abdominal sternite; Hp, process of the ninth sternite; Ep, epiproct; Lpp, left paraproct; Rpp, right paraproct; LC1, basal left cercus; LC1dp, distal process of the LC1; LC2, apical left cercus; RC1, basal right cercus; RC2, apical right cercus.

### **Gibocercus**, new genus

*Type species: Gibocercus chaco*, n. sp.

*Etymology:* The generic name corresponds to one of the generic autapomorphies, a semispheric convexity (gibba) on the dorsal face of LC1dp.

*Diagnosis:* 10Lp with inner tip very large and sclerotized (Fig. 2H), outer tip very small, conical, fleshy along its apical half or more. Oblique depression at base of 10Lp and 10L. LC1dp conical, very well developed (more than twice longer than

the width of the LC1); setae not very numerous, in the apex of the process; with a rounded convexity on the dorsal face of process. LC1 with a second latero-internal basal process (absent in *G. nanai*), with numerous setae (Fig. 2F).

*Description (male)*: Robust, total length 9–16. Mm sclerotized, separated from Sm by a membranous area (completely fused in *G. nanai*). Mandibles as in many tropical Embiidae, with 3-2 incissives, 2-1 molar. Wings: Rs+Ma originating from Cu, near this origin a very short transverse vein joins them with R1; Cu and Ma forked; Sc, R1, Rs+Ma, Rs, Cub and A conspicuous; Ma1, Ma2, and Mp tenuous, specially near the wing edge (except *G. beni*); Cua tenuous along full length (except *G. beni*); transverse veins generally present between C-R1, R1-Rs, Rs-Ma1, Ma-Mp (no transverse veins between Rs-Ma1 in *G. chaco*). 10T typical of Embiidae: two well differentiated plates, with regular inner edges, joined only by a thin but well sclerotized bar. A large unsclerotized area in basal half of 10R. 10Rp2 very short and wide (in other neotropical embiids, long and thin), well sclerotized, with a wide rounded edge. Distal process of LC1 very developed, conical, directed forwards; LC1dp setae restricted to the apex of the process (in other taxa, setae cover most of the process). LC1 with a second process (except in *G. nanai*), basal and latero internal, finger-shaped, with numerous setae. Lpp with nodule and microtrichiae. Hp with transversal keels.

*Distribution*: The new genus is found in the southern part of the Neotropical Region (Argentina, Brasil, Perú and Bolivia).

*Relationships*: In the cladistic analysis, *Gibocercus* appears as sister group of *Bi-guembeia* sharing the 10Rp1 non-bifid, with microtrichiae, 10Lp with the base short and wide, and tips of the 10Lp completely separated.

The monophyly of *Gibocercus* is supported by LC1dp conical, a nodule with setae on the inner-basal face of the LC1 (absent in *G. nanai*), a semispheric convexity on the dorsal face of the LC1dp, the shape of the 10Lp tips (see diagnosis), and 10Rp2 wide and rounded. The nodule on the inner-basal face of the LC1 is very unusual; comparable structures are known for very few embiids. *Pachylembia* has a similar but less conspicuous and acusculate process; *Pseudembia* and *Dinembia* have a sort of wart, but set on the dorsal face of the process, and the cuspsules are not confined to the wart. Both the morphological differences, and the distribution of other characters, indicate that the conditions in *Pachylembia*, *Pseudembia* and *Dinembia* are not homologous with the one in some *Gibocercus*.

*G. chaco* and *G. nanai* share the presence of one cross-vein between Rs+Ma and Mp and the absence of cross-veins between Ma-Mp (characters with a lot of homoplasy). *G. chaco*, *G. nanai*, and *G. urucumi* form a monophyletic group (excluding *G. beni*, see Fig. 1), supported by having two cross-veins between Rs-Ma1 (a character with homoplasy).

#### KEY TO SPECIES OF *GIBOCERCUS* (MALES)

1. Inner-basal face of the LC1 without a nodule, Mm and Sm not separated by a membranous band (Fig. 5B) . . . . . *G. nanai*
- Inner-basal face of the LC1 with a nodule with setae (Fig. 2H), Mm and Sm separated by a membranous band (Fig. 2B) . . . . . 2
2. 10Lp with a flat base (Fig. 3F), outer tip of the 10Lp constricted basad (Fig. 3F) . . . . . *G. urucumi*

- 10Lp with a globose base, outer tip of the 10Lp no constricted basad (Fig. 2H) . . . . . 3
- 3. Cross-vein between Ma1-Ma2 present, outer tip of the 10Lp small (less a fifth longer than the inner tip length) (Fig. 4D), nodule of the LC1 with rounded apex . . . . . *G. beni*
- Cross-vein between Ma1-Ma2 absent, outer tip of the 10Lp big (a half longer than the inner tip length) (Fig. 2H), nodule of the LC1 with oblique apex (Fig. 2F) . . . . . *G. chaco*

***Gibocercus chaco*, n. sp.**

(Fig. 2A–H)

*Type*: Male holotype IFML, from ARGENTINA: Santiago del Estero, Reserva Copo, 7-24-X-1990, J. Lopez de Cazenave.

*Etymology*: The specific name corresponds to the phytogeographic region of the type locality.

*Diagnosis*: *G. chaco* can be distinguished of the other species of the genus by having 2 or 3 cross-veins between Rs-Ma, no cross-veins between Rs-Ma1, and medial bladder of the hind basitarsus small and close to the external face. *G. chaco* can be distinguished of *G. urucumi*, by the outer tip of the 10Lp thin with longitudinal keels and the nodule of the Lpp well developed and conical. The apex of the LC1bp is obliquous and not rounded as *G. beni* and *G. urucumi*.

*Male (Holotype)*: Thorax brownish, head brown with a dorso-posterior more or less circular brownish area, the rest orangish brown.

Total length: 15.2. Head (Fig. 2A): width/length, 0.80; eyes (Fig. 2A) with OR: 0.58. Mandibles as Figure 2A. Sm as Figure 2B. Wing length: fore, 10.80; hind, 9.28. Wing venation: Sc, R1, Cub and A well developed, Cua inconspicuous, the rest conspicuous. Cross-veins: fore wing, C-R1: 6 or 8, R1-Rs: 2 or 3, Rs-Ma: 2 or 3, Rs+Ma-Mp: 1; hind wing, C-R1: 5, R1-Rs: 2 or 3, Rs-Ma: 0 or 1, Ma-Mp: 1. Hind basitarsus (Fig. 2C) with numerous setae on inner and outer face, length: 0.62, width/length: 0.39, medial bladder small compared to the other species of the genus, closest to the outer face of the tarsus, medial bladder diameter/basitarsus width: 0.38.

Terminalia (Fig. 2D–H): 10Rp2 broad and well sclerotized, 10Rp1 with microtrichiae (Fig. 2G); basal region of the 10Lp with a semispheric convexity (Fig. 2D, H). Hp with transversal keels. Nodule of the Lpp conical (Fig. 2E) with microtrichiae, Rpp no sclerotized. Longitudinal ratio of LC1/LC2: 1.11. LC1bp conical (Fig. 2F), short, with apex obliquely truncated in latero-dorsal view.

*Female*: Unknown.

***Gibocercus urucumi*, n. sp.**

(Fig. 3A–H)

*Type*: Male holotype MZSP, from BRASIL: Mato Grosso, Serra do Urucum-Corumba, 30-XI-1960, K. Lenko.

*Etymology*: The specific name refers to one of the names of the type locality.

*Diagnosis*: Medial bladder of the hind basitarsus large (more than 50% longer than the basitarsus width); apical third of inner face of the basitarsus without setae. Cross-veins present between Mal-Mp, Mp-Cua. Base of the 10Lp flat (not with a semispheric convexity like *G. chaco* and *G. beni*), outer tip of the 10Lp long and sharp, with a constriction on the base (absent in *G. chaco* and *G. beni*); inner tip of the

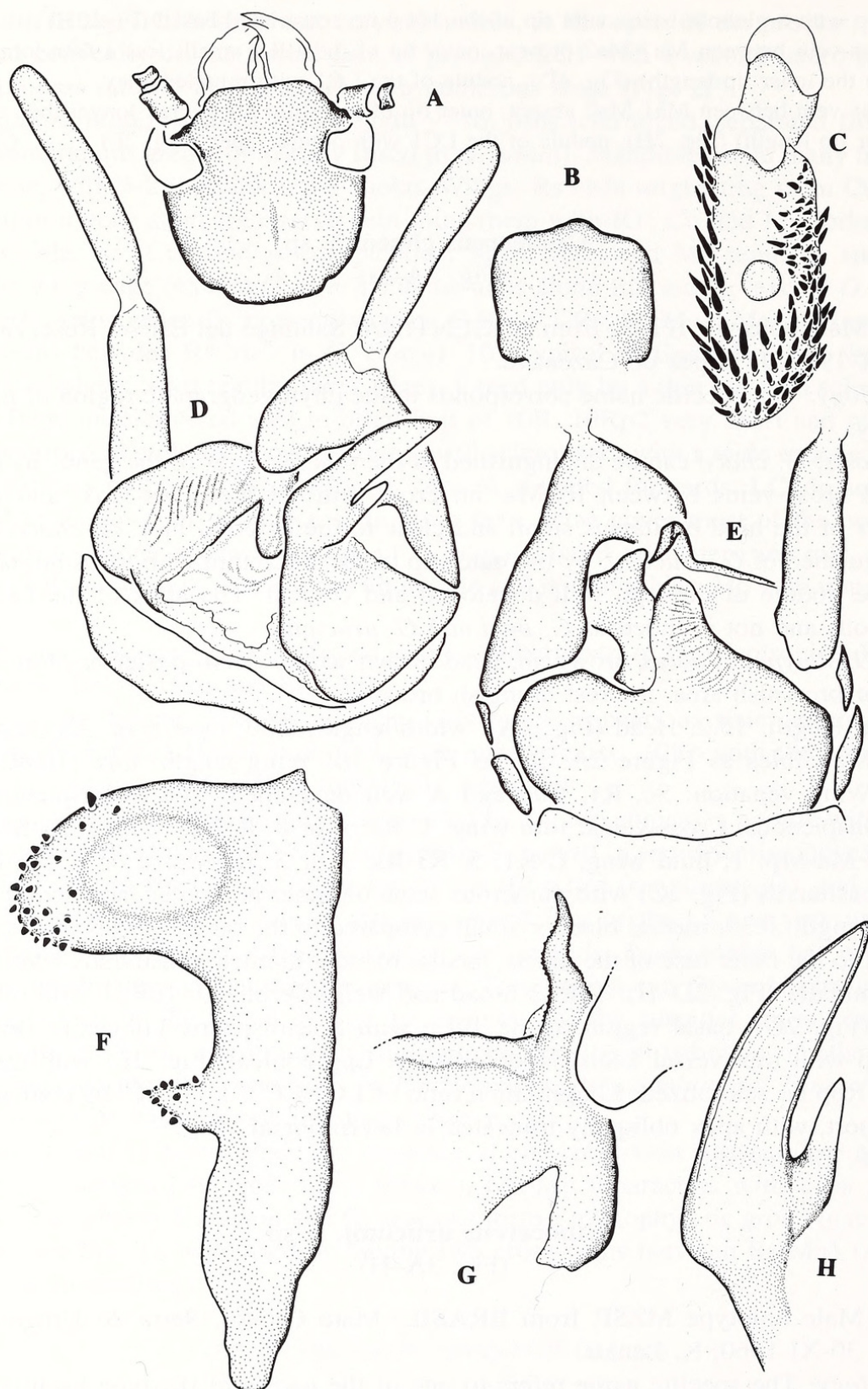


Fig. 2. *Gibocercus chaco*, male. A, head; B, Mm+Sm; C, hind basitarsus; D, terminalia, dorsal view; E, terminalia, ventral view; F, LC1, dorsal view; G, 10Rp1, latero-external view; H, 10Lp, dorsal view.

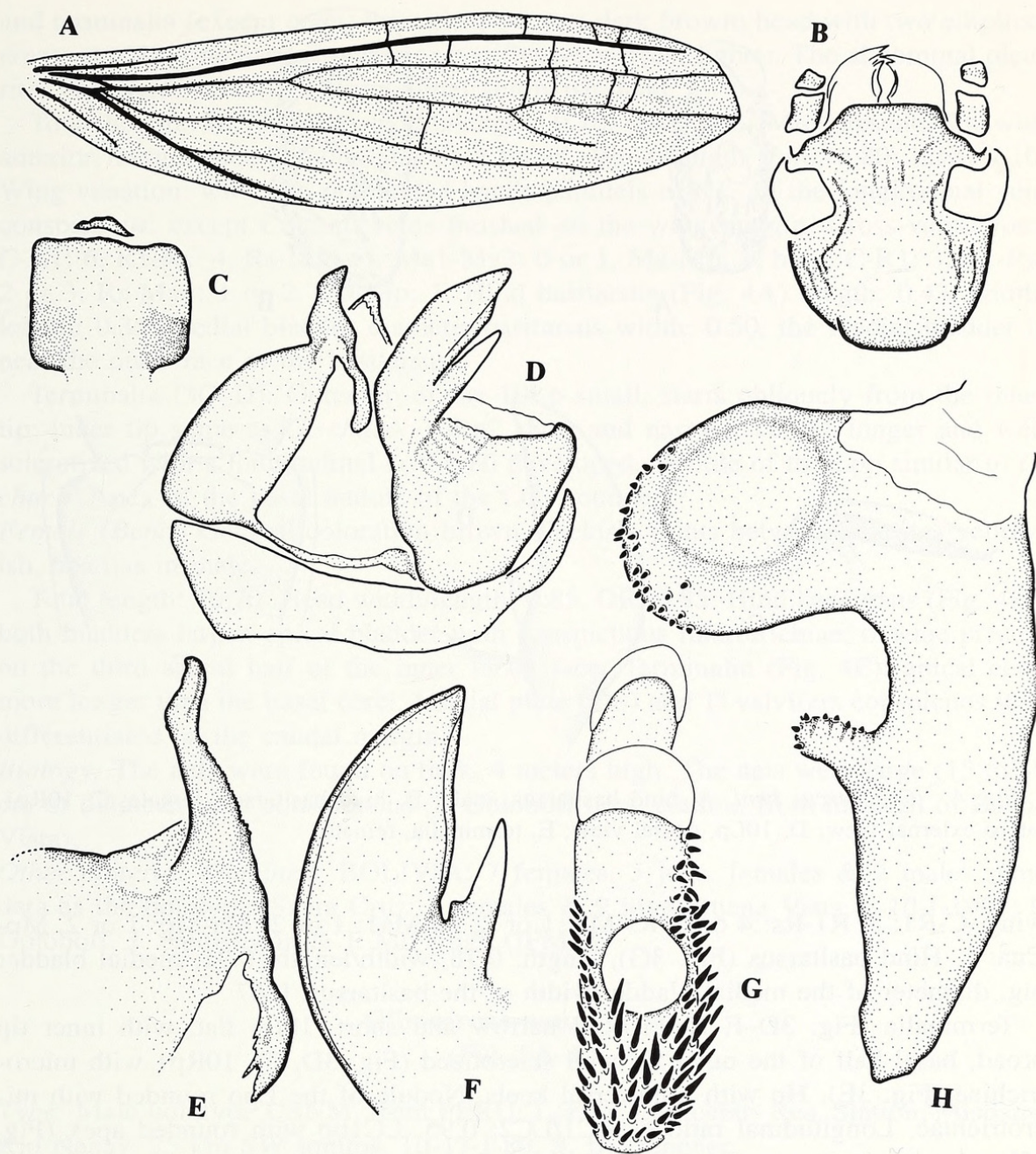


Fig. 3. *Gibocercus urucumi*, male. A, fore wing; B, head; C, Mm+Sm; D, terminalia, dorsal view; E, 10Rp1, latero-external view; F, 10Lp, ventral view; G, hind basitarsus; H, LC1, dorsal view.

10Lp broad, without longitudinal keels. LC1bp with rounded apex, setae on the apex and the caudal face of the process.

**Male (Holotype):** Head, 1° to 18° antennal segment, tibiae and tarsi, and terminalia brown, the rest orangish brown.

Total length: 16.16. Head (Fig. 3B): width/length, 0.79; OR: 0.50. Mandibles as Figure 3B. Sm as in Figure 3C. Wing length: fore, 12.00; hind, 10.88. Wing venation (Fig. 3A): similar to *G. chaco*; Ma2 and Cua tenuous. Cross-veins: fore wing, C-R1: 4, R1-Rs: 3 or 4, Rs-Ma: 1, Rs-Ma1: 2 or 5, Ma-Mp: 1 or 3, Ma1-Mp: 1; hind

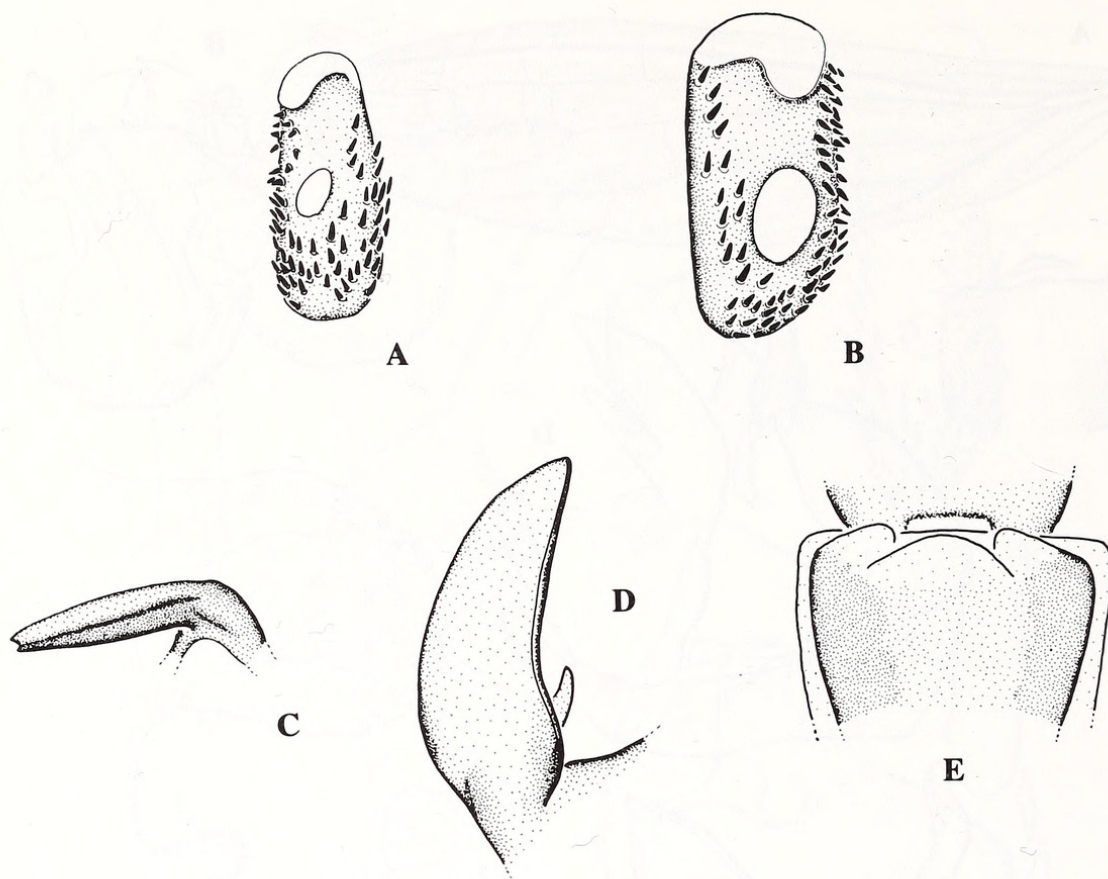


Fig. 4. *Gibocercus beni*. A, hind basitarsus, male; B, hind basitarsus, female; C, 10Rp1, latero-external view; D, 10Lp, dorsal view; E, terminalia, female.

wing, C-R1: 8, R1-Rs: 4 or 6, Rs-Ma: 1 or 2, Rs-Ma1: 1 or 2, Ma-Mp: 1 or 2, Mp-Cua: 1. Hind basitarsus (Fig. 3G), length: 0.78, width/length: 0.31, medial bladder big, diameter of the medial bladder/width of the basitarsus: 0.67.

Terminalia (Fig. 3D-F, H), 10Rp2 narrow and short, 10Lp flat, with inner tip broad, basal half of the outer tip well sclerotized (Fig. 3D, F), 10Rp1 with microtrichiae (Fig. 3E). Hp with transversal keels. Nodule of the Lpp rounded with microtrichiae. Longitudinal ratio of LC1/LC2: 0.95. LC1bp with rounded apex (Fig. 3H).

*Female*: Unknown.

### ***Gibocercus beni*, n. sp.**

(Fig. 4A-E)

*Type*: Male holotype MCZ, from BOLIVIA: Beni, Rurrenabaque, X-XI-1956, L. Peña.

*Etymology*: The specific name corresponds to the type locality.

*Diagnosis*: Hind basitarsus with 3 or 4 setae on the distal third of the inner face; outer tip of the 10Lp small (less than a fifth longer than the inner tip length) and well sclerotized; basal nodule of the LC1 small, with few setae; dorsal tip of the 10Rp1 with a well developed longitudinal keel with microtrichiae.

*Male (Holotype)*: Antennae, prothorax, meso, metathoracic sternites yellowish; legs

and terminalia (except cerci) brownish, the rest dark brown; head with two elliptical areas: anterior one darker, posterior one (between eyes) lighter. The abdominal pleurites and sternites have a longitudinal yellowish band.

Total length: 10.70. Head, width/length, 0.70, OR: 0.66. Mm present, Sm with anterior margin membranous and base broad. Wing length: fore, 8.80; hind, 7.10. Wing venation: with two pigmented bands parallels to R1, all the longitudinal vein conspicuous, except Cua, all veins finished on the wing margin. Cross-veins: fore, C-R1: 6, R1-Rs: 4, Rs-Ma1: 1, Ma1-Ma2: 0 or 1, Ma-Mp: 1; hind, C-R1: 3, R1-Rs: 2 or 3, Rs-Ma1: 1 or 2, Ma-Mp: 1. Hind basitarsus (Fig. 4A) length: 0.43, width/length: 0.35, medial bladder diameter/basitarsus width: 0.50, the medial bladder is near the outer face of the basitarsus.

Terminalia (3C–D): Outer tip of the 10Lp small, starts obliquely from the inner tip; inner tip same as *G. chaco*. 10Rp2 short and narrow; 10Rp1 longer and well sclerotized with a longitudinal keel well developed. Nodule of the Lpp similar to *G. chaco*. Apex of the basal nodule of the LC1 rounded.

*Female (Beni)*: General coloration brown blackish, joints between sclerites yellowish, head as in male.

Total length: 16.70. Head width/length: 0.85, OR: 0.85. Hind basitarsus (Fig. 4B): both bladders larger, apical bladder with conspicuous microtrichiae; 6 setae present on the third apical half of the inner tarsal face. Terminalia (Fig. 4E): apical cerci more longer than the basal cerci. Medial plate (8°S) and 1° valvifers conspicuos well differentiated on the caudal margin.

*Biology*: The nets were found on bark, 4 meters high. The nets were large (15 to 30 cm of diameter) and conspicuous (P. Goloboff pers. comm., from material of Buena Vista).

*Other material examined*: BOLIVIA: 7 females, 5 juvs. females & 2 males same data as the holotype. Santa Cruz: 2 females & 9 juvs. Buena Vista, 8-10-I-1991, P. Goloboff, J. Santisteban & J. Mc Hugh (IFML).

***Gibocercus nanai*, n. sp.**  
(Fig. 5A–F)

*Type*: Male holotype USNM, from PERÚ: Loreto, Callicebus Res. Station, Mishana, Rio Nanay, 25 km SW Iquitos, 10-17-I-80, S. B. Heppner.

*Etymology*: The specific name refers to one of the names of the type locality.

*Diagnosis*: Eyes well developed; Mm and Sm fused, without a membranous band between them; hind basitarsus with only one setae on the apical third of the inner face; cross-veins absent between Rs-Ma, Ma1-Ma2, Ma1-Mp, Mp-Cua, present between Rs-Ma1, Rs+Ma-Mp; apical cerci clearly longer than the basal cerci; inner tip of the 10Lp well sclerotized, with 2 or 3 longitudinal keels; outer tip blunt, rounded, with irregular surface; LC1dp longer, more than twice longer than the width of the LC1, semispheric convexity on the dorsal base of the LC1dp elliptical; second basal and latero internal process of the LC1 absent.

*Male (Holotype)*: General coloration brownish, 16° antennite to the tip yellowish brown.

Total length: 9.92. Head (Fig. 5A) width/length, 0.81; OR: 0.45. Mandibles as Figure 5A. Mm and Sm fused (Fig. 5B). Wing length: fore, 6.72; hind, 6.08. Wing

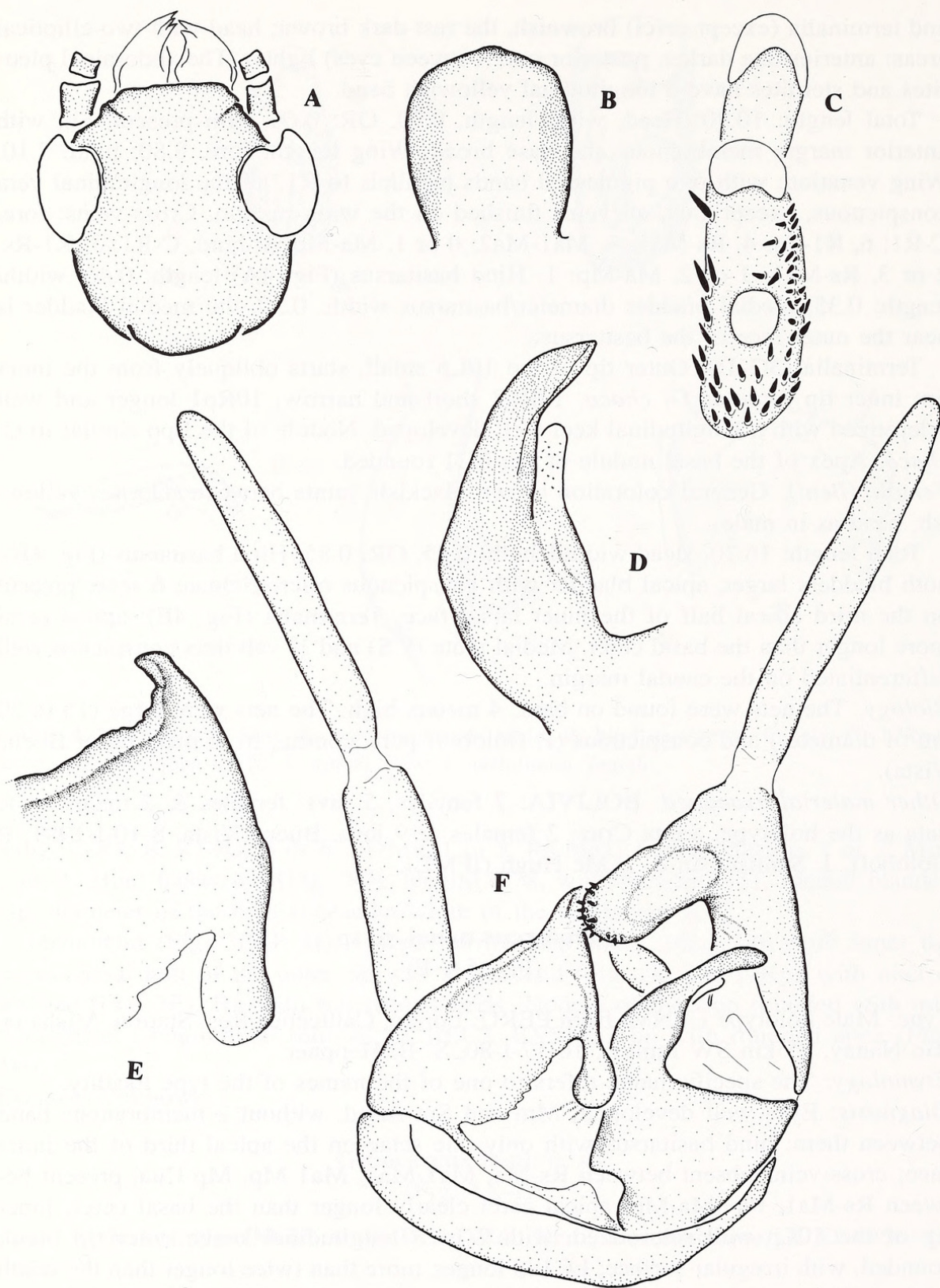


Fig. 5. *Gibocercus nanai*, male. A, head; B, Mm+Sm; C, hind basitarsus; D, 10Lp, latero-external view; E, 10Rp1, latero-external; F, terminalia, dorsal view.

venation: longitudinal veins less conspicuous than in other species of the genus. Cross-veins: fore wing, C-R1: 3, R1-Rs: 1 or 3, Rs-Ma1: 2, Rs+Ma-Mp: 1; hind wing, C-R1: 3 or 4, R1-Rs: 3 or 4, Rs-Ma1: 1 or 3, Ma-Mp: 1. Hind basitarsus (Fig. 5C), length: 0.34, width/length: 0.29, medial bladder bigger, diameter of the medial bladder/width of the basitarsus: 0.60.

Terminalia (Fig. 5D–F): LC1dp longer, extending anteriorly (Fig. 5E). Longitudinal ratio LC1/LC2: 0.85. 10Rp1 short, microtrichiae inconspicuous (Fig. 5C). Inner tip of the 10Lp well sclerotized (Fig. 5D). Hp with transversal keels. Rpp sclerotized, microtrichiae only on the nodule of the Lpp.

*Female*: Unknown.

### **Biguembia**, new genus

*Type species*: *Biguembia copo* n. sp.

*Etymology*: The generic name is a combination of two words, 'bigu' (arbitrary combination) and 'embia'.

*Diagnosis*: LC1dp strongly cubical, flattened in lateral view. 10Rp1 simple, extending posteriorly as an arm with a hunch on its base. Sm quadrangular, base of the Sm broad. Tips of the 10Lp with equal shape, thin and conical, the inner tip more sclerotized and with keels, the outer tip less sclerotized; the process (10Lp) does not have a base.

*Description (male)*: Bigger, total length 16–18. Medial bladder present. Sm with anterior margin straight and diffuse, Mm sclerotized. Winged, Cu forked, all the longitudinal veins conspicuous, with a cross-vein between Mp and Cua; R1 without longitudinal pigmented bands; Rs+Ma originating from Cu and R1. Hind basitarsus broad, bladders well developed.

Terminalia: 10T with membranous area small. 10Rp2 well sclerotized as the rest of the terminalia, without a membranous area between it and the 10R. Lpp with a nodule, more or less sclerotized, with microtrichiae. Rpp sclerotized and conspicuous. Ep sclerotized. LC1dp as in diagnosis; apical cerci longer than the basal cerci.

*Distribution*: This new genus was found in only two localities from Santiago del Estero (Argentina) and one from Mato Grosso (Brasil).

*Relationships*: The synapomorphies of *Biguembia* are mostly wing characters. Others are: the tips of the 10Lp with equal shape, thin and conical, the hunch at the base of the 10Rp1 and the flattened LC1dp.

### **Biguembia copo**, n. sp.

(Fig. 6A–H)

*Type*: Male holotype IFML, from ARGENTINA: Santiago del Estero: Reserva Provincial de Copo, X-1989, J. P. Pelotto.

*Etymology*: The specific name refers to the type locality.

*Diagnosis*: *Biguembia copo* can be distinguished from *Biguembia cocum* by the 10Rp1 with a sharply pointed, inwardly curved process, with a longitudinal keel, the keel starts in the basal hunch of the process. Outer tip of the 10Lp less sclerotized and short (two third longer than the length of the inner tip), the inner tip does not have longitudinal keels. The inner face of the hind basitarsus has many setae. The general coloration is not homogeneous.

*Male (Holotype)*: Head, wings and terminalia brown, thorax, legs and abdominal

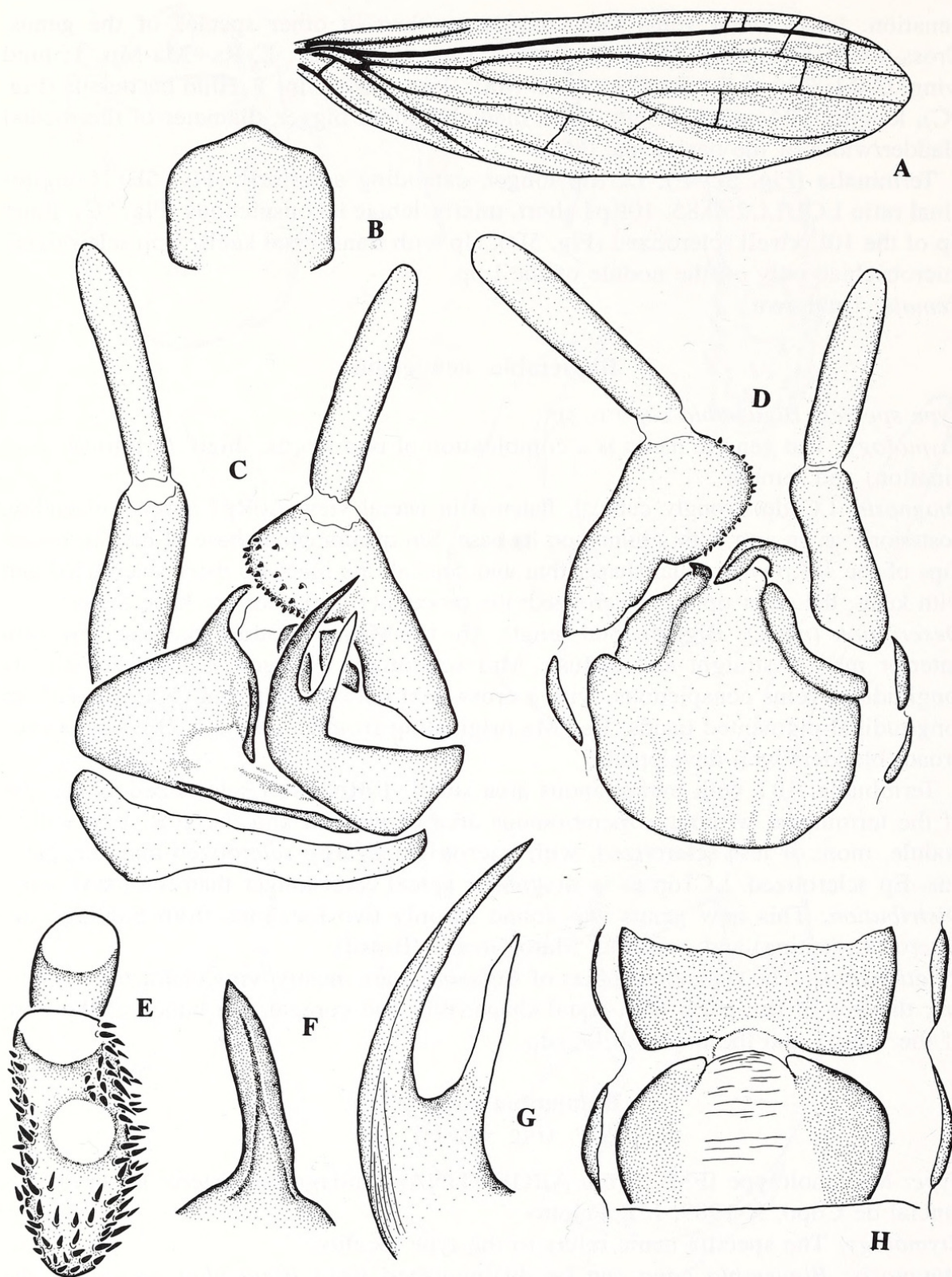


Fig. 6. *Biguembia copo*. A, fore wing; B, Mm+Sm; C, terminalia male, dorsal view; D, terminalia male, ventral view; E, hind basitarsus; F, 10Rp1, dorsal view; G, 10Lp, dorsal view; H, terminalia female.

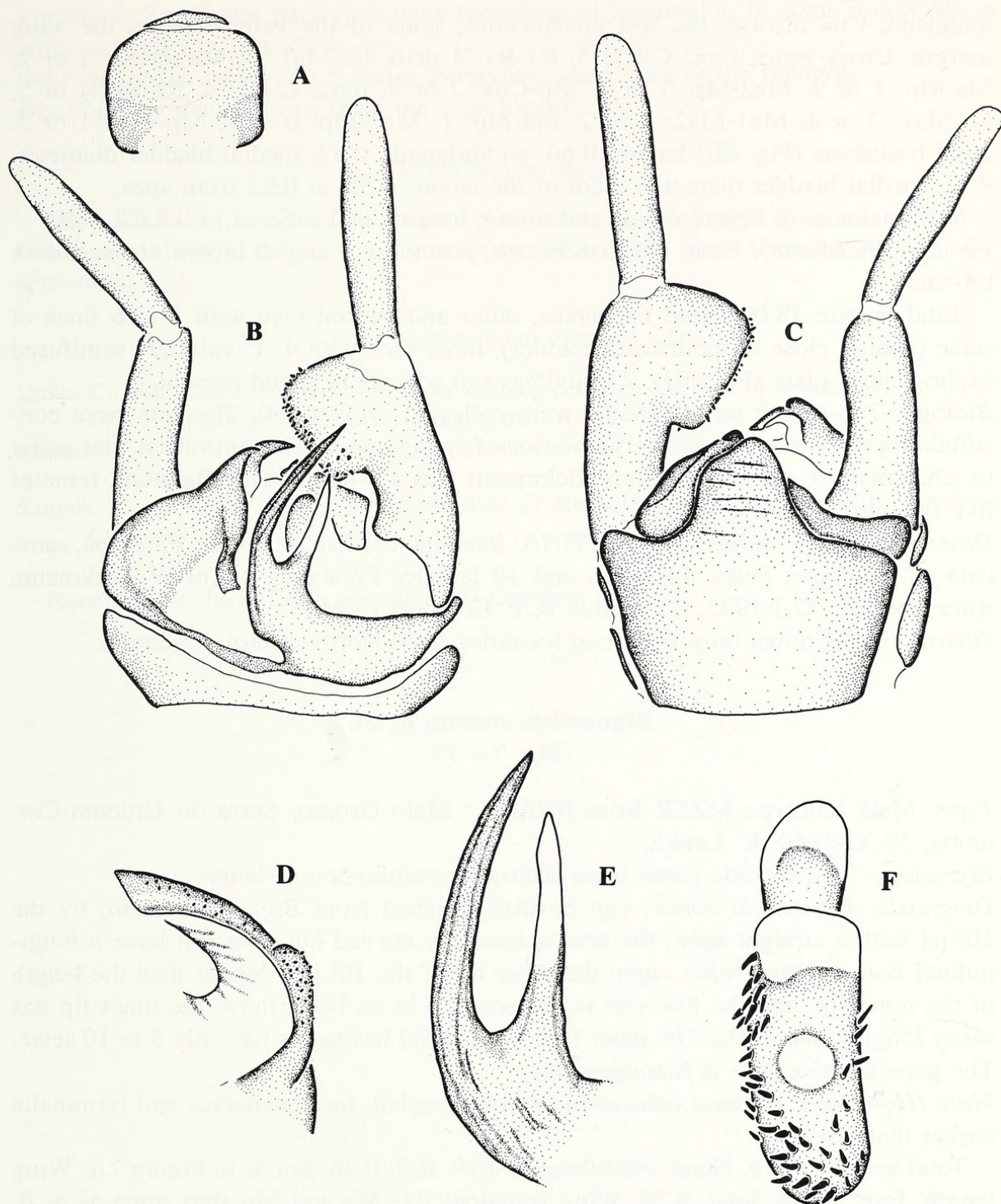


Fig. 7. *Biguembia cocum*, male. A, Mm+Sm; B, terminalia, dorsal view; C, terminalia, ventral view; D, 10Rp1, latero-external view; E, 10Lp, dorsal view; F, hind basitarsus.

tergites brownish, abdominal sternites yellowish white. Antenna: 1° to 25° antennite brown, 26° to 28° antennite brownish, 29° antennite to the tip yellowish white.

Total length: 16.32. Head width/length: 0.82. RO: 0.48. Sm as Figure 6B. Wing length: fore. 10.40; hind, 9.28. Wing venation (Fig. 6A): Rs+Ma and Mp start from a cross-vein between Cu and R1; Ma and Cu forked; R1, Cub and A strongly de-

marcated, Cua diffuse, the rest conspicuous, none of the veins reaches the wing margin. Cross-veins, fore: C-R1: 5, R1-Rs: 4 or 6, Rs-Ma1: 3, Ma1-Ma2: 1 or 2, Ma-Mp: 1 or 2, Ma2-Mp: 1 or 2, Mp-Cua: 2 or 3; hind: C-R1: 4, R1-Rs: 4 or 5, Rs-Ma1: 3 or 4, Ma1-Ma2: 1 or 2, Ma-Mp: 1, Ma2-Mp: 0 or 1, Mp-Cua: 1 or 3. Hind basitarsus (Fig. 6E) length: 0.60, width/length: 0.37, medial bladder diameter: 0.12, medial bladder diameter/width of the tarsus: 0.55, at 0.22 from apex.

Terminalia as in Figure 6C-D and 6F-G; longitudinal ratio of LC1/LC2: 0.93.

*Female (Hickmann)*: Head blackish brown, prothorax orangish brown, the rest dark brown.

Total length: 18.00. Hind basitarsus: outer and ventral face with 5 to 6 lines of setae (ending close to the medial bladder), inner face with 4. 1° valvifers semifused to the central plate (Fig. 6H), 2° valvifers and secondary gland present.

*Biology*: The nets from Hickmann were collected on wet soil. The nets were constituted by many cross tunnels with a lot of spongy web. The time from first instar to adult male (6 specimens from Hickmann) was 291-346 days. The adult females live for more than 250 days.

*Other material examined*: ARGENTINA: Santiago del Estero: 1 male Paratype, same data as Holotype. Salta: 13 males and 10 females Paratypes 2 Km W Hickmann, Ruta Nac. 81, 27-I-1995, C. Szumik & P. Goloboff (IFML).

*Distribution*: Known only from two localities from Northwestern Argentina.

***Biguembia cocum*, n. sp.**  
(Fig. 7A-F)

*Type*: Male holotype MZSP, from BRASIL: Mato Grosso: Serra do Urucum-Corumba, 30-XI-1960, K. Lenko.

*Etymology*: The specific name is an arbitrary combination of letters.

*Diagnosis*: *Biguembia cocum* can be distinguished from *Biguembia copo*, by the 10Rp1 with a straight apex, the arm is inwardly curved but does not have a longitudinal keel, as *Biguembia copo*; the outer tip of the 10Lp is longer than the length of the inner tip, and the first one is esclerotizad in its basal third; the inner tip has many longitudinal keels. The inner face of the hind basitarsus has only 5 to 10 setae. The general coloration is homogeneous.

*Male (Holotype)*: General coloration brown orangish, fore basitarsus and terminalia darker than the rest.

Total length: 17.76. Head width/length: 0.79; RO: 0.48. Sm as in Figure 7A. Wing length: fore, 10.88; hind, 9.76. Wing venation: Rs+Ma and Mp start same as in *B. copo*; Ma and Cu forked. Cross-veins, fore: C-R1: 6, R1-Rs: 7, Rs-Ma1: 2, Ma-Mp: 1; hindwing: C-R1: 4, R1-Rs: 3 or 4, Rs-Ma1: 1 or 2, Ma1-Ma2: 0 or 1, Ma-Mp: 0 or 1, Mp-Cua: 0 or 1. Hind basitarsus (Fig. 7F) length: 0.64, width/length: 0.31, diameter of the medial bladder: 0.10, diameter of the medial bladder/width of the basitarsus: 0.50, at 0.24 from apex.

Terminalia as in Figure 7B-E, Lpp and Rpp more strongly sclerotized than H; Lpp with microtrichiae; Hp with transversal keels. Longitudinal ratio of LC1/LC2: 0.95.

*Female*: Unknown.

**Variation:** Two male paratypes have teratological terminalia. In some wings Ma is unforked and Mp forked.

**Other material examined:** 5 males Paratypes, same data as the holotype.

**Distribution:** Only known from the type locality.

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#### LITERATURE CITED

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