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New Nemobiinae crickets (Orthoptera, Grylloidea, Trigonidiidae) from northern Neotropical Region

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Laguna negra, Páramo de Ocetá. Photo: Javier vargasj. In medaillon: face of *Acronemobius tabanoensis* n. sp. female holotype MNHN-EO-EO3507.

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New Nemobiinae crickets (Orthoptera, Grylloidea, Trigonidiidae) from northern Neotropical Region

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ABSTRACT
Nemobiinae Saussure, 1877 crickets (Orthoptera, Grylloidea, Trigonidiidae) are particularly well-diversified in the Neotropics, with 11 endemic genera, over the 16 genera reported from the region. We describe two additional genera and four new species from Mexico and Colombia: *Mexiconemobius* n. gen. (type species *Mexiconemobius xalapaensis* n. gen., n. sp.) is the first nemobiine from Mexico not belonging to Pteronemobiini Vickery, 1973; *Absonemobius descampsi* n. sp. and *Phoremia puracensis* n. sp. attest the presence of both genera in Colombia; and *Acronemobius* n. gen. (type species *Acronemobius tabanoensis* n. gen., n. sp.) is described from the Colombian Andes. We discuss the value of hind tibia apical and subapical spurs in nemobiine taxonomy and the distinction between the Pteronemobiini and Nemobiini Saussure, 1877. We present the contrasted distributions of *Absonemobius* Desutter-Grandcolas, 1993 and *Phoremia* Desutter-Grandcolas, 1993 in the Neotropics. The new taxa provide the first evidence for the presence and diversification of the so-called ground crickets in the páramos, as high as 3450 m a.s.l.

KEY WORDS
Colombia, distribution, Mexico, Nemobiini, Pteronemobiini, new records, new species, new genera.

RÉSUMÉ
Nouvelles espèces de grillons de la sous-famille des Nemobiinae (Orthoptera, Grylloidea, Trigonidiidae) provenant du nord de la région néotropicale.
Les grillons Nemobiinae Saussure, 1877 (Orthoptera, Grylloidea, Trigonidiidae) sont particulièrement bien diversifiés en région néotropicale, avec 11 genres endémiques, sur les 16 genres signalés de cette région. Nous décrivons deux genres supplémentaires et quatre espèces nouvelles originaires du Mexique et de Colombie : *Mexiconemobius* n. gen. (espèce type *Mexiconemobius xalapaensis* n. gen., n. sp.) est le premier Nemobiinae du Mexique n'appartenant pas aux Pteronemobiini Vickery, 1973 ; *Absonemobius descampsi* n. sp. et *Phoremia puracensis* n. sp. attestent la présence des deux genres en Colombie ; et *Acronemobius* n. gen. (espèce type *Acronemobius tabanoensis* n. gen., n. sp.) est décrit des Andes colombiennes. Nous analysons l'intérêt des caractères des éperons apicaux et subapicaux du tibia postérieur dans la taxonomie des Nemobiinae et pour la séparation des Pteronemobiini et des Nemobiini Saussure, 1877. Nous présentons la distribution contrastée d'*Absonemobius* Desutter-Grandcolas, 1993 et de *Phoremia* Desutter-Grandcolas, 1993 en région néotropicale. Les nouveaux taxons attestent pour la première fois la présence et la diversification des grillons dits de sous-bois dans les páramos, à des altitudes aussi élevées que 3 450 m a.s.l.

MOTS CLÉS
Colombie, répartition, Mexique, Nemobiini, Pteronemobiini, signalements nouveaux, genres nouveaux, espèces nouvelles.

INTRODUCTION

Nemobiines have long been recognized as a distinct group within the crickets, but they have been assigned to different taxonomic levels. For a long time, Nemobiinae were classified with the field crickets, as a tribe or a subfamily depending on the general taxonomic frame adopted by the author. As a subfamily, they have been transferred into the Trigonidiidae Saussure, 1870 family on a morphological basis (Gorochov 1986; Desutter 1987). The sister relationship to the subfamily Trigonidiinae Saussure, 1870 has been attested only recently with large scale molecular studies of the whole cricket clade (Chintauan-Marquier *et al.* 2013, 2016), and is well-supported by several morphological apomorphies (Desutter-Grandcolas *et al.* 2021).

Studying North American species and genera, Vickery (1973) considered two tribes within the Nemobiinae Saussure, 1877, i.e., the Nemobiini Saussure, 1877 and the Pteronemobiini Vickery, 1973, defined according to the number of subapical spurs and the presence/absence of a short and thick, supposed glandular, subapical spur 4 in males. Since then, the progressive discovery of the diversity of the subfamily lead to the definitions of additional tribes, i.e. Burcini Gorochov, 1986 (now eight genera), Grylliscini Gorochov, 1986 (one genus), Marinemobiini Gorochov, 1985 (now five genera), Lissotrachelini Hubbell, 1938 (one genus, moved from the Pentacentrinae Saussure, 1878), but these taxonomic acts were not performed in a phylogenetic perspective. As a consequence, the tribes are not defined according to mutually exclusive characters (see Hugel & Desutter-Grandcolas 2021 for Burcini) and 20 of the 74 genera (27%) classified in the subfamily have no tribal affiliation (Cigliano *et al.* 2026). This present state of systematic knowledge of the Nemobiinae precludes any study of the evolution of this clade, while a phylogenetic analysis of their world-wide distribution and of their ecological and behavioural diversification would be most welcome.

In the present paper, we describe/redescribe five genera and seven species of Nemobiinae from the Neotropical Region: *Mexiconemobius xalapaensis* n. gen., n. sp. is the first known Mexican nemobiine that does not belong to the Pteronemobiini as currently defined. *Monopteropsis* de Mello & Jacomini, 1994 originates from Northern Colombia; it presents a unique FW condition within Nemobiinae (see de Mello & Jacomini 1994, figure 5), and its classification remains problematical. Here, we emend the description of *Monopteropsis acrophylus* de Mello & Jacomini, 1994. We extend the known distribution of *Absonemobius* Desutter-Grandcolas, 1993, previously known only as far North as Costa Rica, to the Mexican states of Veracruz and Chiapas (*Absonemobius* spp.), and we describe a new species from Colombia. Similarly, the presence of *Phoremia* Desutter-Grandcolas, 1993, previously only known from Peru and Brazil, is confirmed in Colombia through the description of a new species from the páramos of the Cauca Department (3450 m a.s.l.), and additional material from the Putumayo Department (1650 m a.s.l.). Finally, *Acronemobius tabanoensis* n. gen., n. sp., which could be close to *Phoremia*, is described from Colombian páramos of the Nariño department at 3200 m a.s.l.

Through the descriptions of these taxa, we discuss the limits of the tribes acknowledged today within the subfamily and the characters that have been used to define them, especially the presence of so-called glandular subapical spurs on the male hind tibia. We also extend the known distributions of several genera, and highlight the surprising diversity of the Nemobiinae in the Colombian Andean páramos. The taxa presented here confirm the considerable evolutionary interest of the Nemobiinae, their high diversification in the Neotropics and the need to clearly characterize natural groups of genera within this superficially homogenous, large clade.

MATERIAL AND METHODS

Morphology

In crickets s.l., apical tibial spurs (a) can first be identified according to their location on tibial side, i.e. inner (ia) versus outer (oa). On each side, they are also identified according to their location on tibia apex, i.e. ventral vs dorsal for TI and TII, which have at most four apical spurs each, and ventral (1), median (2) and dorsal (3) for TIII, which has at most

six apical spurs (three on each side). Most Nemobiinae have six apical spurs on hind tibiae, but some have only five, as *Hygronemobius* Hebard, 1913 for example.

The subapical (sa) spurs are identified on inner (isa) and outer (osa) sides of hind tibiae, and according to their positions from TIII apex upwards, the first subapical spurs being the closest to dorsal apical spurs. The inner subapical spurs 1 to 3 are sometimes particularly elongated, swollen and more or less concave ventrally, at least at their base, instead of having the regular, narrow shape of outer subapical spurs (see figs 9, 10); these spurs, which occur only in males, may play a role in mating, as observed for the short isa4 of Pteronemobiini (Di Rienzo & Marshall 2013) and references therein). Although modified spurs were initially interpreted as glandular structures (Vickery, 1973), no definitive evidence supporting a secretory function has been reported to date. They are consequently referred here without presuming a glandular function.

Male genitalia are named after Desutter (1987), modified in Desutter-Grandcolas (2003). Although nemobiine genitalia are very small, the different 'lobes' present on pseudepiphallic apex could be identified as follow: the median lobes are usually in medio-dorsal location, facing the median plate of pseudepiphallic sclerite; the lateral lobes are connected to the lateral sclerotization of pseudepiphallus; the pseudepiphallic parameres are usually more ventral in location, and they are partly sclerotized especially at their attachment to the ectophallic apodeme via a connecting sclerite (here called a-ps.p., by analogy with the way a cross vein connecting two main veins A and B would be named, i.e. with a hyphen a-b). This homology criterion to identify the pseudepiphallic parameres is usually quite obvious, and is clear for example in *Mexiconemobius* n. gen. or *Absonemobius*. It is applied here to interpret the male genitalia of *Phoremia* species, and to separate the median lobes, the lateral lobes and the pseudepiphallic parameres. In Nemobiinae, there is no distinct sclerotized structure corresponding to a true ectophallic arc; what has traditionally been referred to as the 'arc' actually corresponds to the variably sclerotized floor of the epi-ectophallic invagination (EEI). We therefore refer to this structure as the 'EEI sclerotization'.

FFOCT observations

We used a Light-CT Scanner (LLTech SAS, Paris, France) to image two of the specimens in air. This instrument is an optical sectioning imaging system based on full-field optical coherence tomography (FFOCT) (Vabre *et al.* 2002). It provides in depth *en face* images of a sample over a one-millimeter travel range, with 1.5 µm lateral and axial resolutions, over a 1250×1250 µm² field of view.

As the refraction index mismatch between air and the immersion medium of the reference arm (silicone oil, n=1.41) introduces defocus in depth, blurring images and reducing the signal intensity, we used Light-CT tools to compensate for this defocus all along the axial displacement (Dubois 2017).

The result of a FFOCT acquisition is a stack of images representing slices at each depth. We used ImageJ software (Schindelin *et al.* 2012) to combine (average Z projection) either all of these slices (Fig. 10A, D) or only a subset of them (Fig. 10B, C), in order to visualize the entire sample or to isolate a portion of it respectively. We also applied a gamma correction (power law) to Figure 10A-C in order to balance higher and weaker signals.

Abbreviations

Institutions

ANSP	Academy of Natural Sciences of Philadelphia, Philadelphia;
MNHN	Muséum national d'Histoire naturelle, Paris;
MNRJ	Museo Nacional de Rio de Janeiro, Rio de Janeiro;
MZUSP	Museu de Zoologia da Universidade de Sao Paulo, Sao Paulo.

Measurement

BL	body length;
FIII	hind femur;
FW	forewing;
iod	interocular distance;
L	length;
ovp	ovipositor;
Prn	pronotum;
tars1.III	basitarsomere III;
TIII	hind tibia;
W (a, p)	width (anterior, posterior).

Morphology

I, II, III	anterior, median, posterior (leg, tibia, femur, tarsi);
DD, LL	dorsal disc, lateral lobe of pronotum;
ia1, 2, 3	inner apical spur 1, 2 or 3 of TIII;
isa1, 2, 3	inner subapical spur 1, 2 or 3 of TIII;
oa1, 2, 3	outer apical spur of TIII;
osa1, 2, 3	outer subapical spur of TIII;
SGP	subgenital plate.

Male genitalia

a-ps.p.	sclerotization between EEI and the pseudepiphallic paramere;
d.cav.	dorsal cavity;
ec.a.	ectophallic apodeme;
ec.f.	ectophallic fold;
EEI	epi-ectophallic invagination;
en.a.	endophallic apodeme;
en.s.	endophallic sclerite;
l.l.	lateral lophi of pseudepiphallus;
m.l.	median lophi of pseudepiphallus;
ps.p.	pseudepiphallic paramere;
ps.s.	pseudepiphallic sclerite;
r.	rami;
v.v.	ventral valves.

Distribution and maps

Distribution maps were produced using QGIS 3.44. Occurrence data were based on examined specimens, including type material and additional records in MNHN collection. Type localities were obtained from the original species descriptions and from the Orthoptera Species File (Cigliano *et al.* 2026). Each locality was georeferenced and plotted as point data on a base map of the Neotropical region.

RESULTS

Superfamily Grylloidea Laicharting, 1781
Family Trigonidiidae Saussure, 1874
Subfamily Nemobiinae Saussure, 1877

Genus *Mexiconemobius* n. gen.
(Figs 1; 2; 9A, B; 13)

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Type species. — *Mexiconemobius xalapaensis* n. sp. (by monotypy).

Diagnosis. — Within Neotropical Nemobiinae, *Mexiconemobius* n. gen. is characterized by the following combination of characters: male and female apterous without auditory tympana; TII with two apical spurs, ventral, subequal in length. TIII with three pairs of subapical spurs, alternate and short, neither thickened, nor concave even in male (Fig. 9A, B); subapical spurs subequal in length on each side, the inners slightly longer and curved distally; TIII subapical spurs all shorter than the longest apical spur; first subapical spurs not close to apical spurs, even on inner side. TIII with three inner and three outer apical spurs; on inner side: dorsal apical spur the longest, slightly longer than half basitarsomere III; median apical spur slightly shorter than dorsal inner spur; ventral apical spur about 1/3 median spur length; on outer side: median apical spur the longest, shorter than the median inner spur; dorsal spur slightly longer than ventral spur. TIII shorter than FIII. Basitarsomere III more than half TIII length; inermous, except for one inner and one outer apical spines.

Male. TIII inner apical and subapical spurs neither inflated, nor concave ventrally (Figs 1A; 9A, B). Male genitalia (Fig. 1D-F) very large for a nemobiine; pseudepiphallic sclerite with large lateral expansions, anteriorly and posteriorly; pseudepiphallic parameres long and hook-like; endophallic sclerites well developed, the median part narrowed subdistally.

Female. Ovipositor extremely short, consisting almost entirely of its apex (Fig. 2). Ventral valves greatly and abruptly narrowed at basal third, acute otherwise and smooth. Dorsal valves strongly crenulated on dorsal margins, except for the thin and acute apex.

Distribution. — Mexico, State of Veracruz (Fig. 13).

Etymology. — Genus named after its distribution in Mexico, and the suffix 'nemobius' attributed to many taxa of the subfamily, and referring to their living in forest (νέμος, woods; βίος, life, after Serville 1838: 345).

Remarks

Because of the characters of its TIII spurs and its male genitalia, *Mexiconemobius* n. gen. cannot be included in the Pteronemobiini. It shares the same number of subapical spurs (three pairs on each side) with *Hygronemobius*, *Pineronemobius* Yong, 2018, *Absonemobius* p.p., *Phoremia*, and *Nemobius* Serville, 1838, the type genus of the Nemobiini. *Hygronemobius* and *Pineronemobius* lack an inner ventral apical spur (present in *Mexiconemobius* n. gen.); the male genitalia of *Hygronemobius* are characterized by a squared pseudepiphallic sclerite, long and membranous lophi directed ventrally and a long and rounded ectophallic fold, all these characters not present in *Mexiconemobius* n. gen., while those of *Pineronemobius* could be more similar to those of some *Absonemobius* (see Yong 2018: figure 9; Desutter-Grandcolas 1993 figures 36-40; Desutter-Grandcolas & Hugel 2016). *Mexiconemobius* n. gen. is apterous, as *Absonemobius* and *Phoremia* (*Nemobius* has fully-developed or small forewings), but its male genitalia differ greatly from those genera, especially for the shape of pseudepiphallic sclerite, parameres and rami. The Neotropical genus *Zuchiella* de Mello, 1990 is also apterous, but shows four pairs of TIII subapical spurs, none short and thick in males, and its genitalia are close to those of *Absonemobius* (de Mello 1990: figures 5-7).

Pepoapua Jesus & Pereira, 2017 and *Monopteropsis* de Mello & Jacomini, 1994, also classified in the Nemobiini, have four inner and three outer subapical spurs, and their male genitalia could be more similar to those of Pteronemobiini than to those of *Nemobius* (see Jesus *et al.* 2017: figure 4; de Mello & Jacomini 1994: figure 2). All these genera differ anyway from *Mexiconemobius* n. gen., which can be classified here neither in the Pteronemobiini, nor in the Nemobiini.

Description

Size and general coloration

Middle sized nemobiine with abundant strong, black setae and shorter golden setae on its whole body. General coloration brown, the face, legs, cerci and pronotum DD lighter; no contrasted coloured pattern (Figs 1; 2).

Head and pronotum

Head (general shape, ocelli, eyes, scapes, maxillary palpi) and pronotum as in current Nemobiinae (Desutter-Grandcolas *et al.* 2021).

Legs

TI with two apical, ventral spurs, subequal in length; without an inner and an outer tympanum. TII with two apical, ventral spurs, subequal in length. TIII with three inner and three outer apical spurs; inner spur relative size: ia1 < ia2 < ia3; outer spur relative size: oa1 < oa3 < oa2; oa1 and ia1 subequal. TIII with three inner and three outer subapical spurs, all subequal, not increasing in size toward TIII apex; ia3 about twice as long as subapical spurs, and about half as long as basitarsomere III. No spur widened or concave at base; no subapical spur shortened and thicker. TIII not serrulated. Basitarsomere III very long, higher than wide; no dorsal spine, except for one inner and one outer, the inner spine longer than the outer; with two apical spurs, the inner twice as long as the outer.

Male (Fig. 1)

Apterous. No thoracic and abdominal tergite glandular. Supra-anal plate long and narrow, plicate at 90° at mid length, slightly concave between lateral and apical margins. Subgenital plate very large for a nemobiine, much longer than wide, bordering the very large male genitalia.

Male genitalia (Fig. 1D-F)

Very large for a Nemobiinae. General shape of genitalia quadrate (Fig. 1D); pseudepiphallic sclerite more or less H-shaped, due to the long, wide and convex lateral expansions of the pseudepiphallic sclerite, separated by a narrow, transverse dorsal sclerotization (Fig. 1D); a pair of small, membranous medial lophi (Fig. 1D); no separate lateral lophi. Pseude-

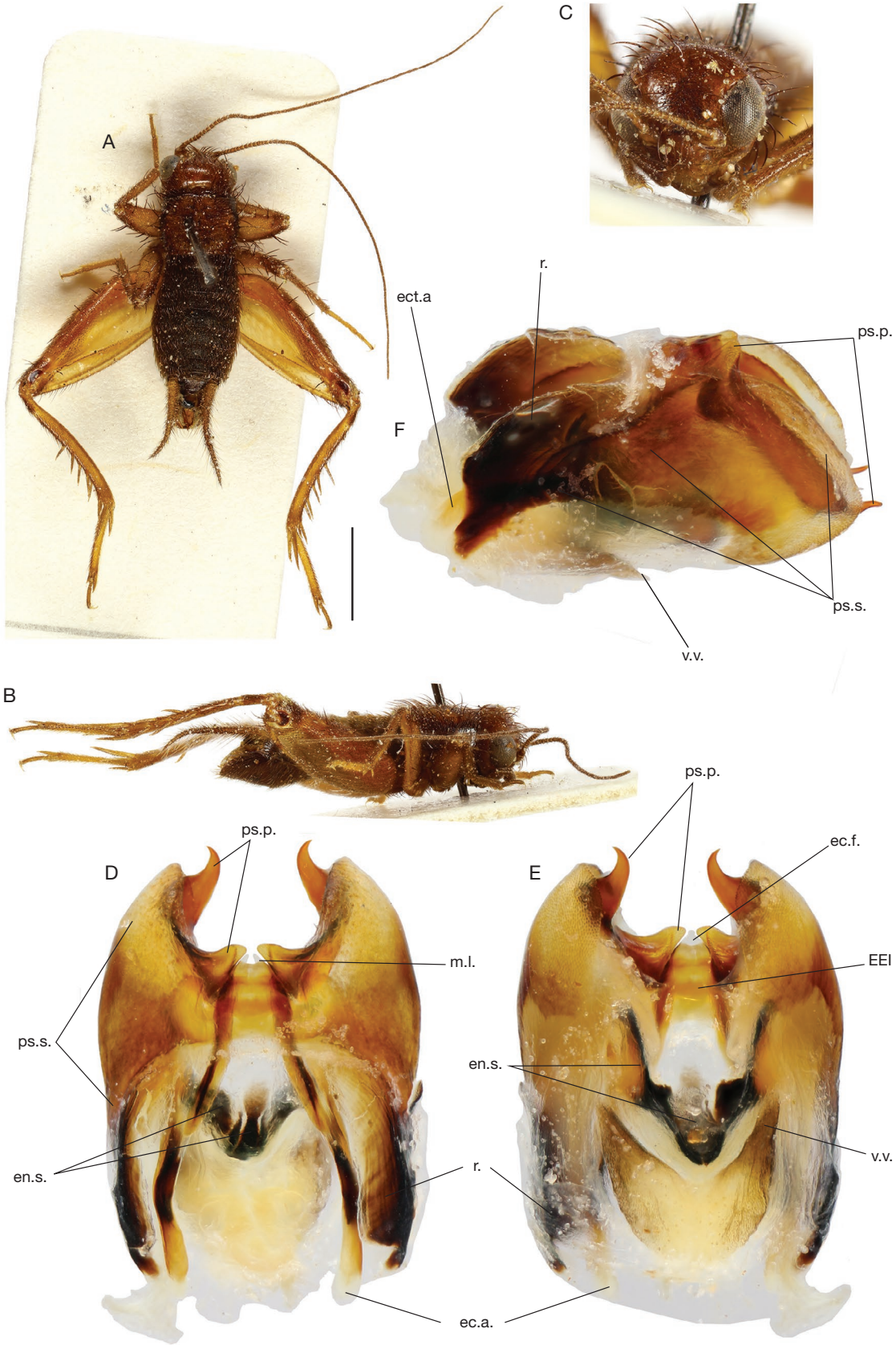


Fig. 1. — *Mexicononemobius xalapaensis* n. gen., n. sp., male holotype MNHN-EO-EO3143: **A**, **B**, dorsal and lateral view; **C**, face; **D**-**F**, male genitalia, dorsal (**D**), ventral (**E**), side (**F**) views. Abbreviations: See Material and methods. Scale bar: 2 mm.

piphallic parameres long and narrow, with a distal hook, and anteriorly with a triangular expansion that partly covers the median lophi (Fig. 1D, E). Rami short and wide (Fig. 1F). Ectophallic apodemes long and relatively thick for a nemobiine (Fig. 1D). Endophallic sclerite typical of a nemobiine but well-developed, with a long and thin median sclerite, bordered by a pair of thin, narrow and short sclerites, and more externally by a pair of very large sclerites narrowed at mid length (Fig. 1D). Ventral valves long and thin, reinforced (Fig. 1E).

Female (Fig. 2)
As the male. Supra-anal plate long and narrow, plicate, concave. Subgenital plate transverse. Ovipositor very short, not reaching the cerci apex (Fig. 2A, D), and wide (see Fig. 2D); ventral valves very wide at base where it envelops the dorsal valve, greatly and abruptly getting narrow at apex level; dorsal valve wide, regularly becoming narrow toward apex; apex of both valves acute and smooth, except the dorsal margin of dorsal valve with few, strong crenulation (Fig. 2E).

REMARK
According to Cigliano *et al.* (2026), five Nemobiinae genera have been recorded in Mexico, and all belong to the Pteronemobiini tribe, characterized mostly by four pairs of subapical spurs on hind tibiae, the fourth inner subapical spur being short and supposedly glandular in males. These genera are *Allonemobius* Hebard, 1913, *Argizala* Walker, 1869, *Marcelonemobius* Cadena-Castañeda, Rodríguez & Navarrete-Heredia, 2019, *Neonemobius* Hebard, 1913 and *Pteronemobius* Jacobson, 1904. *Mexiconemobius* n. gen. is the first nemobiine obviously not belonging to Pteronemobiini, as defined today, described from Mexico.

Mexiconemobius xalapaensis n. sp.
(Figs 1; 2; Table 1)

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TYPE LOCALITY. — Mexico; Veracruz, Xalapa.

TYPE MATERIAL. — **Holotype**. **Mexico** • 1 ♂; Veracruz, Xalapa, Jardin botanique; 1.IX.1990, jour, litière; L. Desutter rec.; MNHN-EO-EO3143.
Allotype • 1 ♀; same locality, collector and habitat as the holotype; 31.VIII.1990; MNHN-EO-EO3506.
Paratypes. Mexico • 1 ♂; same locality, collector, date and habitat as the holotype; MNHN-EO-EO3552 • 2 ♂; same locality, collector, date and habitat as the allotype; MNHN-EO-EO3551, EO3553 • 1 ♂; same locality, collector, date and habitat as the allotype; MNRJ • 4 ♀; same locality, collector, date and habitat as the allotype; MNHN-EO-EO3509, EO3510, EO3511, EO3512 • 1 ♀; same locality, collector, date and habitat as the allotype; MNRJ.

ETYMOLOGY. — Species named after its type locality.

DIAGNOSIS. — As for the genus.

HABITAT. — Species found by day in the leaf litter of deciduous forest.

DESCRIPTION
In addition to the characters of the genus.

TABLE 1. — Measurements (in mm) of males and female of *Mexiconemobius xalapaensis* n. gen., n. sp.

	BL	iod	PrnL	PrnW	FIIIL	FIIIW	TIIIL	tars1-III	OvpL
♂ Holotype	5.95	0.89	1.48	1.61	4.16	1.64	3.19	1.43	–
♀ Allotype	6.40	0.95	1.48	1.64	4.64	1.72	3.27	1.53	1.38
♂ n = 4									
Average	6.0	0.95	1.47	1.57	4.33	1.62	3.18	–	–
Min	5.8	0.89	1.43	1.52	4.19	1.59	3.06	–	–
Max	6.2	1.02	1.52	1.59	4.51	1.65	3.33	–	–
♀ n = 4									
Average	6.75	0.99	1.5	1.65	4.44	1.75	3.21	1.5	1.42
Min	6.4	0.94	1.41	1.56	4.38	1.72	3.14	1.44	1.33
Max	7.0	1.06	1.56	1.70	4.50	1.76	3.28	1.56	1.52

Body size
Around 6 mm.

Coloration
General coloration brown (Figs 1A; 2A), with the legs, cerci, pronotum DD, face (Figs 1C; 2C), cheeks and base of antennae lighter. Abdomen, meso- and metanotum blackish brown. Cerci with a lighter basal ring.

Pronotum
Slightly wider than long.

Male
Supra-anal plate long and narrow (Fig. 1A), slightly concave dorsally between its margins. Subgenital plate large, longer distally.

Male genitalia
Very large for a nemobiine. General shape quadrate (Fig. 1D, E); pseudepiphallic sclerite more or less H-shaped due to the long, wide and convex lateral expansions of pseudepiphallic sclerite separated by its narrow and transverse dorsal part; median lophi small and membranous, somewhat dejected ventrally (Fig. 1D); pseudepiphallic sclerite prolonged anteriorly on each side by a narrow sclerite, doubled by an additional, wider sclerite (that could be the rami, Fig. 1D). Pseudepiphallic parameres long, arcuate and narrow, their distal parts hook-like, slightly asymmetrical (Fig. 1F); anterior part of pseudepiphallic parameres triangular, located above the median lophi (Fig. 1D, E, F). Ectophallic apodemes long and relatively thick for a nemobiine (Fig. 1D), longer than the rami; a subdistal sclerotisation of EEI perhaps present (Fig. 1E). Endophallic sclerite complex, typical of nemobiine crickets (Fig. 1D, E), but very well developed; median sclerites very long, narrowed subdistally, bordered on each side by a very thin and short sclerite, and more externally by a very wide sclerite. Ventral valves long and thin, each reinforced distally (Fig. 1E, F).

Female
Supra-anal plate long and relatively narrow (Fig. 2D). Subgenital plate transverse, distal margin sinuate. Ovipositor extremely

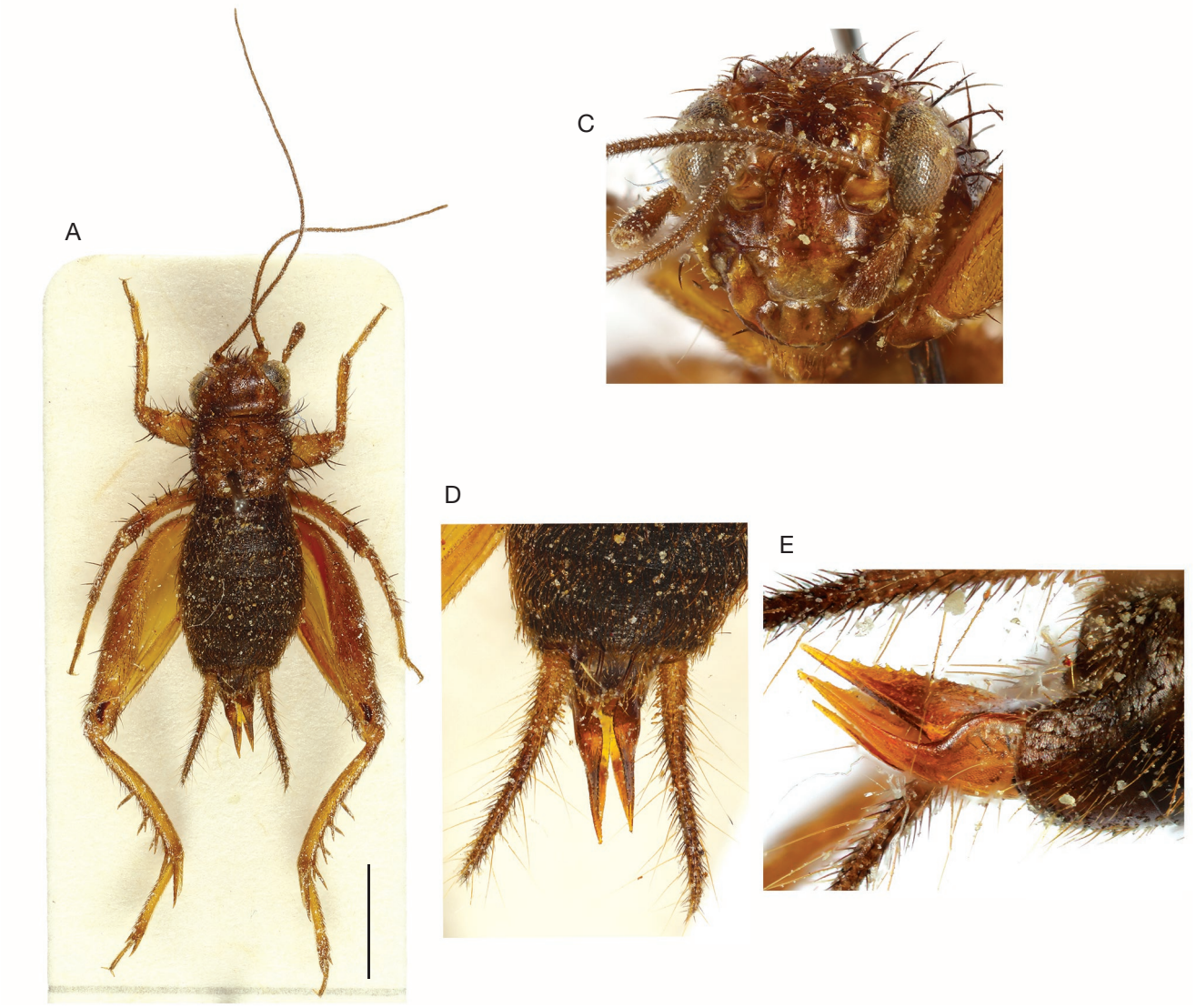


Fig. 2. — *Mexicononemobius xalapaensis* n. gen., n. sp., female allotype MNHN-EO-EO3506: **A**, **B**, dorsal and lateral view; **C**, face; **D**-**E**, ovipositor, dorsal (**D**) and side (**E**) views. Scale bar: 2 mm.

short, almost reduced to its apex (Fig. 2D, E); ventral valves greatly and abruptly narrowed at 1/3 of their length, acute on about 2/3 of their length, without crenulation; dorsal valves regularly narrowed toward apex, strongly crenulate on dorsal margins, their apex thin and acute (Fig. 2E).

Measurements (in mm)
See Table 1.

Genus *Acronemobius* n. gen.
(Figs 3; 13; Table 2)

urn:lsid:zoobank.org:act:9DE0178D-305B-45F6-BD67-C4C23A1AEFA5

Type species. — *Acronemobius tabanoensis* n. sp. (by monotypy).

Diagnosis. — Within Neotropical Nemobiinae, *Acronemobius* n. gen. is characterized by the following combination of characters: very large nemobiine with shiny cuticle and a very bright coloration yellow and blackish brown (Fig. 3A); head very wide compared to pronotum, and much wider than long (Fig. 3A); face very short, the distance between ventral margin of antennal pit and epistemal suture equal to scape length; vertex flat (Fig. 3B); ocelli set as a flat triangle, lateral ocelli bigger than median ocellus (Fig. 3C); scape wider than long. TI with two apical spurs, ventral; without inner and outer tympanum. TII with two apical spurs, ventral. TIII with three inner and three outer apical spurs, the dorsal inner and the median outer the longest on each side respectively, the former the longest and as long as half basitarsomere III; TIII with three pairs of long and thin subapical spurs, slightly alternate, the first subapical spurs not close to the dorsal apical spurs, the spurs getting longer toward TIII apex, but short compared to basitarsomere III length (Fig. 3B); TIII apical and subapical spurs distinctly thinner and perhaps curved at apex (Fig. 3B).

Female. Apterous; ovipositor long and straight, the apex hardly enlarged (Fig. 3D); apex of dorsal valves with many shallow ornamentations, more or less aligned along superior margin and dispersed on outer surface (Fig. 3D).
Male. Unknown.

DISTRIBUTION. — Colombia, Nariño department, páramo de [El] Tábano, 3200 m (Fig. 13). This páramo is located in the Central zone of the páramos of the Nariño department, south Colombia (Solarte *et al.* 2007 *in* Martinez-Revelo & Lopera-Toro 2014).

ETYMOLOGY. — Genus named after its occurrence in the high-altitude paramos of Colombia (from the Greek acro, high), and the suffix 'nemobius' attributed to many taxa of the subfamily.

REMARK
Among Neotropical genera, only *Absonemobius* p.p., *Hygronemobius*, *Mexiconemobius* n. gen., *Phoremia* and *Pineronemobius* have three pairs of subapical spurs on TIII. *Acronemobius* n. gen. can be separated from *Hygronemobius* and *Pineronemobius* by its head shape and by the presence of the ventral inner apical spur of TIII (lacking in these two genera, which heads are not wider than the pronotum). The head and pronotum shapes and a much bigger size also distinguish *Acronemobius* n. gen. from *Absonemobius*, *Mexiconemobius* n. gen. and *Phoremia*.

Acronemobius n. gen. can be separated from *Monopteropsis* by its much wider head compared to pronotum, its TIII apical and subapical spurs (number, shape, distance from inner apical spurs, fringes of long setae) and its bigger size.

DESCRIPTION
Size and general coloration
Large nemobiine with shining cuticle. General coloration blackish brown with a pattern of yellow dots.

Head
Very large, much wider than pronotum, almost as long dorsally (from fastigium to occiput distal margin) as pronotum length. Eyes not protruding, largely separate. Vertex flat. Ocelli as a very flat triangle; lateral ocelli much bigger than median ocellus. Face very short, the distance between lower margin of antennal pit and epistemal suture equal to scape length. Maxillary palpi: article 5 slightly longer than article 4, much longer than article 3; article 5 regularly widened toward apex.

Pronotum
Much wider anteriorly than posteriorly; width of DD posterior margin 1.04 × pronotum midlength; width of DD anterior margin 1.3 × pronotum midlength.

Legs
TI with two apical spurs, both ventral, inner longer than outer; no inner and outer tympanum. TII with two apical spurs, both ventral, inner longer than outer. TIII with three inner and three outer apical spurs; inner spur relative size: ia1 < ia2 < ia3, median and dorsal inner spurs with a fringe of very long, closely-set light yellow setae; outer spur relative size: oa1 < oa3 < oa2; oa1 and ia1 subequal. TIII with three inner and three outer subapical spurs, all subequal, very long and thin, slightly alternate, increasing in size toward TIII apex, isa1 and osa1 not close to dorsal apical spurs; isa1 almost as long as the longest apical spur, i.e. ia3. TIII not serrulated. Basitarsomere III very long, slightly higher than wide; no dorsal spine, except for one inner and one outer, the inner spine longer than the outer; with two apical spurs, the inner twice as long as the outer.

Male
Unknown.

Female
Apterous. Supra-anal plate much longer than wide, concave. Subgenital plate transverse. Ovipositor straight; apex only slightly widened after the middle; apex of dorsal valves widened on ventral margin only, with both ventral margins and a median crest slightly crenulate; ventral valves slightly enlarged on ventral margin, with a notch on dorsal margin.

REMARK
Acronemobius n. gen. is described even though it is known only by one female, because of its remarkable morphological characters (head and pronotum, TIII spurs, coloration, size, shape of ovipositor) and its occurrence in high-altitude páramos.

Acronemobius tabanoensis n. sp.
(Fig. 3; Table 2)

urn:lsid:zoobank.org:act:1ED60E86-BF36-4018-8E05-D3FEC9255933

TYPE LOCALITY. — Colombia, Departamento Nariño, páramo de [El] Tábano, 3200 m.

TYPE MATERIAL. — **Holotype**. **Colombia** • 1 ♀; Departamento Nariño, páramo de [El] Tábano, 3200 m; 6.XI.1968; M. Descamps rec.; MNHN-EO-EO3507.

ETYMOLOGY. — Species named after its type locality.

DIAGNOSIS. — As for the genus.

DESCRIPTION
In addition to the characters of the genus.

Size
Species large for a Neotropical nemobiine (BL 8 mm), with a very large head (head width behind the eyes 2.65 mm), relatively short TIII and ovipositor, and long basitarsomere III (see Table 2).

Coloration
Head and LL black, shiny (Fig. 3B, C); head dorsum with four equally distant longitudinal yellow lines (Fig. 3A): one pair of longer and wider lateral lines, running along each eye inner margin, from the occiput to lateral ocelli, and one pair of shorter distal lines, median. Scapes, antennae and palpi black

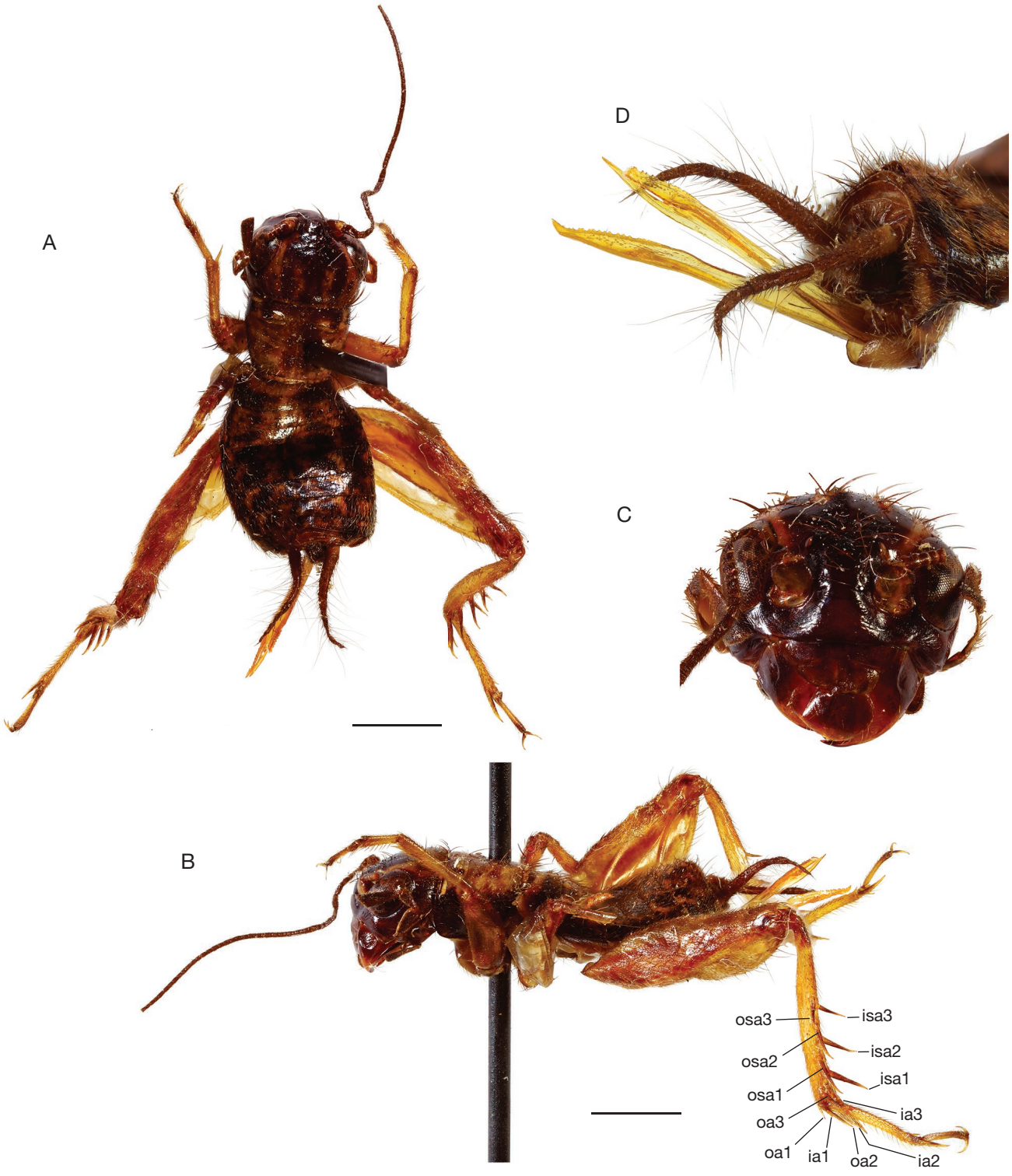


FIG. 3. — *Acronemobius tabanoensis* n. sp. female holotype MNHN-EO-EO3507: **A**, **B**, dorsal and lateral view; **C**, face, not at scale; **D**, ovipositor, side views, not at scale. Abbreviations: see Material and methods. Scale bars: 2 mm.

brown (Fig. 3C). DD yellowish (Fig. 3A), largely mottled with brown, separated from black LL (Fig. 3B) by a more or less distinct yellow oblique band, prolonged along DD posterior margin; anterior margin yellow. Body (Fig. 3A, B) otherwise mottled yellow and black, with narrow yellow flecks aligned medially, and bigger yellow flecks making more irregular bands, four dorsal and one on each body side. Last tergites and supra-anal plate light brown (Fig. 3D). Cerci brown with

TABLE 2. — Measurements (in mm) of female holotype of *Acronemobius tabanoensis* n. gen., n. sp.

	BL	iod	PrnL	PrnWa	PrnWp	FIIIL	FIIIW	TIIIL	tars1-III	ovipL
♀ H	8	1.55	1.75	2.30	1.83	5.05	1.88	3.85	3	1.90

a lighter basal ring (Fig. 3A, D). Sternites yellowish, with two large longitudinal brown bands; last tergite light brown with a large yellow fleck on each side distally; subgenital plate brown. Legs (Fig. 3A, B) light yellowish brown, femora darker with lighter dots.

Male
Unknown.

Female
Ovipositor about half TIII length. Female genitalia not studied.

Measurements (in mm)
See Table 2.

Genus *Absonemobius* Desutter-Grandcolas, 1993
(Figs 4; 5; 9C-E; 11)

Absonemobius Desutter-Grandcolas, 1993: 26.

TYPE SPECIES. — *Absonemobius tessellatus* Desutter-Grandcolas, 1993.

OTHER SPECIES INCLUDED. — *Absonemobius guyanensis* Desutter-Grandcolas, 1993; *A. minor* Desutter-Grandcolas, 1993; *A. niger* Desutter-Grandcolas, 1993; *A. nauta* Desutter-Grandcolas, 1993; *A. septentrion* Desutter-Grandcolas & Hugel, 2016; *A. lucensis* Desutter-Grandcolas & Hugel, 2016; *A. vincenti* Desutter-Grandcolas & Hugel, 2016; *A. darienicus* (Hebard, 1913); *A. alatus* Otte, 2006; *Absonemobius descampsi* n. sp.; *Absonemobius* spp.

DIAGNOSIS. — See Desutter-Grandcolas (1993: 26).

DISTRIBUTION (Fig. 11). — Northern Neotropical Region: eastern and western Amazonia in the South (Desutter-Grandcolas 1993); southern Central America (Panama, Costa Rica) and the Lesser Antilles (Guadeloupe, St Lucia, St Vincent) (Desutter-Grandcolas & Hugel 2016). *Absonemobius* is reported here for the first time in Colombia (*Absonemobius descampsi* n. sp.) and its distribution in Central America is extended as far north as southern Mexico (*Absonemobius* spp.: Chiapas and Veracruz states). *Absonemobius* is not reported today from central Amazonia and the Atlantic Forest, nor in the drier vegetal formation as in Central Brazil or southern South America.

REMARK
No inflated subapical spur that could be hypothesized as glandular according to its shape has been described to date in the genus, which is devoid of the small and thick isa4 of the Pteronemobiini. *Absonemobius descampsi* n. sp. is the first species of the genus with largely swollen inner subapical spurs on hind tibia in males (compare Figure 9D, E with the subapical spurs in *A. tessellatus* as shown on Figure 9C, see Material and methods).

Absonemobius descampsi n. sp.
(Figs 4; 9D, E; Table 3)

urn:lsid:zoobank.org:act:CE4B269D-B04C-4F5A-8C84-5CBA94934604

TYPE LOCALITY. — Colombia, Dept. El Valle Marès [sic] [dept. Valle del Cauca], Cali, 2000 m.

TYPE MATERIAL. — **Holotype. Colombia** • 1 ♂; Dept. El Valle Marès [sic] [dept. Valle del Cauca], Cali, 2000 m; 9.II.1968; M. Descamps; MNHN-EO-EO3633.

DIAGNOSIS. — Within the genus, relatively large species characterized by its uniform black brown coloration, with yellowish legs and cerci; TIII with three pairs of subapical spurs. Male with all three inner subapical spurs swollen and greatly enlarged basally (Fig. 9D), their inner sides concave and setose (Fig. 9E); dorsal and median inner apical spurs also inflated, with thinner apex (Fig. 9E). Male genitalia resembling those of the other South American species of the genus by their general shape and structures (pseudepiphallus without a wide basal part and a narrow distal part, *contra* species occurring in the Lesser Antilles), but the pseudepiphallus more squared (neither rounded as in *A. tessellatus*, nor rectangular as in *A. guyanensis*), without dorsal setae (*contra A. minor*), devoid of an endophallic cavity (present in all the other species), and with well separate median lobes (*contra A. tessellatus*, *A. guyanensis*, *A. minor*, *A. nauta*). Female unknown.

DESCRIPTION
In addition to the characters of the genus:

Size
Species large for the genus (see measurements in Table 3).

Coloration
Head (including palpi and antennae), thorax and abdomen black brown, shining. Sternites ochre brown laterally; subgenital plate black brown. Legs and cerci light yellowish, the femora a little more orangish.

Legs
TIII (Fig. 4B, 9D) with three inner and three outer subapical spurs, all short, somewhat longer toward TIII apex. TIII with three inner and three outer apical spurs; oa1 and oa3 subequal, shorter, oa2 the longest, about twice as long as oa1 and oa3; ia2 twice as long as ia1, ia3 the longest, more than half basitarsomere III length; ia1 shorter than oa1. Basitarsomere III with two apical spines.

Male
TIII isa1-3 greatly inflated, concave ventrally and setose (Fig. 9D, E); ia2 and ia3 also inflated, with thin and acute apex (Fig. 9E).

Male genitalia (Fig. 4D, E)
Very small. Pseudepiphallus only slightly longer than wide (not considering the rami) and slightly convex laterally; no narrow distal part, but instead pseudepiphallus made of a dorsal median plate, short and broadly oval, and a pair of lateral sclerites related to the rami anteriorly and

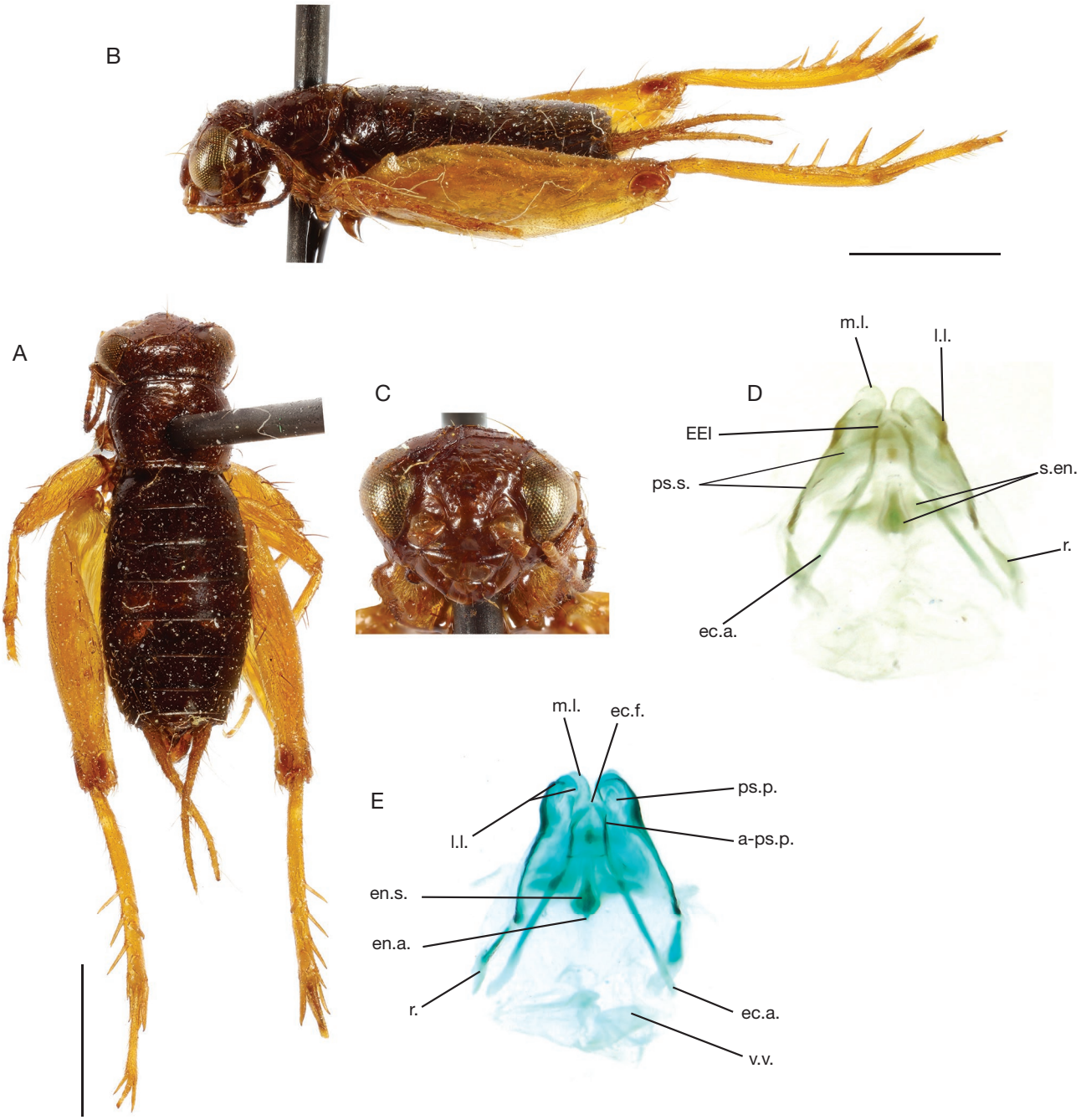


FIG. 4. — *Absonemobius descampsi* n. sp. male holotype MNHN-EO-EO3633: **A**, **B**, habitus, in dorsal (**A**) and lateral (**B**) view; **C**, face; **D**-**E**, male genitalia, dorsal (**D**), ventral (**E**) views. Abbreviations: see Material and methods. Scale bars: 2 mm.

to the lateral lobes posteriorly (Fig. 4D). Median lobes globulous, membranous (Fig. 4D). Lateral lobes at least partly sclerotized, bifid (Fig. 4E). Pseudepiphallic parameres short, membranous, located ventrally to the median lobes (Fig. 4E). Rami elongate and thin, articulated to the pseudepiphallic sclerite; median plate of pseudepiphallic sclerite well-defined, apparently separate from the lateral sclerites (Fig. 4D). Median lophi slightly longer than lateral lophi. Ectophallic apodemes reaching rami apex; EEI almost completely sclerotized; a short and thin sclerotization running from the EEI to the pseudepiphallic parameres (Fig. 4E, a-ps.p.). Median endophallic sclerite well-developed, with a crest-like endophallic apodeme, and flanked with wide lateral sclerites; no well-developed dorsal cavity (Fig. 4E).

Female

Unknown.

TABLE 3. — Measurements (in mm) of male holotype of *Absonemobius descampsi* n. sp.

	BL	iod	PrnL	PrnW	FIIIL	FIIIW	TIIIL	tars1-III
♂ Holotype	5.25	1.03	1.33	1.60	3.75	1.58	2.58	1.08

Measurements (in mm)
See Table 3.

REMARK
One juvenile female from Colombia (Dept. El Valle Marès, 1650 m; 17.X.1968; M. Descamps; MNHN-EO-EO3634) belongs to *Absonemobius* and attests the wider presence of the genus in this country. Its specific identification is uncertain.

Absonemobius sp.
(Fig. 5)

TYPE LOCALITY. — Mexico, Chiapas, Tuxtla Gutierrez, Ocozocoautla.

MATERIAL EXAMINED. — **Mexico** • 5 juveniles; Chiapas, Tuxtla Gutierrez, Ocozocoautla, Route d'Ocuilapa, Laguna Belgica; 19.X.1990; forêt, jour, litière; L. Desutter; MNHN-EO-EO3508, EO3513, EO3514, EO3515, EO3516.

REMARK
Within the genus, this Chiapanecan species has three pairs of subapical spurs. According to the oldest juvenile (EO3508), this species could be separated by its coloration, which is as follows: Body of a uniform light ochre with numerous strong black setae; a line around the eyes, and the cheeks, scapes, bases of antennae and mouthpart tips light yellowish. Legs yellowish grey, the femora darker with whitish dots at the base of long setae; FIII with five whitish dots on dorsal margin, and on outer side a pair of larger yellowish flecks close to the knee and a series of thin yellowish oblique line. Cerci yellowish, becoming greyish toward tip. Apparently, some subapical spurs of this oldest juvenile are larger than other subapical spurs and concave ventrally (Fig. 5B, arrows); these are the first and second outer subapical spurs.

Absonemobius sp.

MATERIAL EXAMINED. — **Mexico** • 1 juvenile; Veracruz, Jalapa, Jardin botanique; 1.IX.1990; L. Desutter; jour, litière; MNHN-EO-EO3554.

REMARK
This specimen attests the presence of *Absonemobius* in the Veracruz state of Mexico. It seems different from the Chiapanecan species of *Absonemobius* by its coloration (FIII entirely light brown, without whitish flecks).

Tribe Nemobiini Saussure, 1877

TYPE GENUS. — *Nemobius* Serville, 1838.

Genus *Monopteropsis* de Mello & Jacomini, 1994
(Figs 6; 13)

Monopteropsis de Mello & Jacomini, 1994: 27.

TYPE SPECIES. — *Monopteropsis acrophilus* de Mello & Jacomini, 1994.

OTHER SPECIES INCLUDED. — *Monopteropsis vicinus* de Mello & Jacomini, 1994. The two species known presently in the genus are distributed according to elevation, *M. vicinus* being recorded at low elevation (about 1370 m a.s.l.) and *M. acrophilus* being recorded in higher altitude (about 2300-2600 m a.s.l.), according to de Mello & Jacomini (1994).

EMENDED DIAGNOSIS. — According to de Mello & Jacomini (1994), and examined MNHN material. Head broader than pronotum, higher than wide in front view. TI with two apical spurs, ventral; without tympanum. TII with three apical spurs, the outer dorsal spur missing. FIII particularly wide and robust. TIII with four inner and three outer subapical spurs, none modified and so-called glandular; first subapical spurs not close to the apical spurs, even on inner side; with three inner and three outer apical spurs, dorsal spur the longest on inner side, dorsal spur slightly longer than median spur on outer side. Basitarsomere III not serrulated but with two apical spines, one on each side. In male, right forewing short, coriaceus, displaced medially (Fig. 6A, B, F, G), with a stridulatory file; left forewing regressed, hidden under the pronotum. Male genitalia very small, rectangular and flat (Fig. 6D-E); pseudepiphallic sclerite with a slightly sclerotized median plate (not figured in de Mello & Jacomini 1994 figures 5D, I), in addition to lateral sclerotization (Fig. 6D-E, I); with wide and flat median lophi, and bifid, distal lateral lophi; pseudepiphallic parameres small and flat; ectophallic apodemes long and thin, divergent; no complete sclerotization of EEI; median endophallic sclerite spear-shaped; one pair of sclerites on each side of the median endophallic sclerite, including a short, faint sclerite close to endophallic median sclerite and a larger, longer than wide external sclerite. Female apterous. Ovipositor long and straight, without ornamentation.

DISTRIBUTION. — Northern Colombia (Fig. 13). *Monopteropsis* is known from the Sierra San Lorenzo, Sierra Nevada de Santa Marta, Magdalena Department, along the Caribbean Sea at two different altitudes (2300-2600 m a.s.l. for *M. acrophilus*, and 1370 m a.s.l. for *M. vicinus*).

REMARK
Cigliano *et al.* (2026) mention two different localities for the distribution of *Monopteropsis* in the Magdalena Department, the 'Sierra San Lorenzo' on one hand, and the 'Santa Marta, Hacienda Cincinnati' on the other, while both species have been described from the 'Sierra San Lorenzo' (de Mello & Jacomini 1994).

Monopteropsis acrophilus de Mello & Jacomini, 1994
(Fig. 6; Table 4)

Monopteropsis acrophilus de Mello & Jacomini, 1994: 27.

TYPE LOCALITY. — Colombia, Magdalena, Sierra san Lorenzo, 7500 to 8500 feet (2300-2600 m a.s.l.).



Fig. 5. — *Absonemobius* sp., male juvenile MNHN-EO-EO3508 from Mexico (Chiapas, Tuxtla Gutierrez, Ocozocoautla): **A**, dorsal view; **B**, **C**, left and right lateral views; **D**, face. Scale bars: 2 mm. **Arrows** show outer subapical spurs apparently larger and concave ventrally.

Type material. — **Holotype. Colombia** • 1 ♂; Magdalena, Sierra san Lorenzo; 7500 to 8500 feet; 27-29.VII.1920; M. Hebard; ANSP. **Paratypes. Colombia** • 14 ♂, 13 ♀; same data as the holotype; ANSP • 2 ♂, 1 ♀; same data as the holotype; MZUSP.

Material examined. — **Colombia** • 1 ♂; Département Magdalena, Sierra Nevada de Santa Marta, San Lorenzo, 2200 m; 1-3.XI.1970; M. Descamps; MNHN-EO-EO3556.

Emended diagnosis. — In addition to the characters of the genus and those listed in de Mello & Jacomini (1994):
Coloration. Head dorsum yellowish, with five brown longitudinal lines, including a wide median line crossed by a thin yellow line along its whole length and arriving posteriorly to the ocelli, and a shorter line close to each cheek; three ocelli, located each in a short black line, joining anteriorly to the face coloration (median ocelli), or to the coloration of the antennal pits; face and cheeks dark brown,

shining; scapes yellowish, the antennae becoming progressively brown. Pronotum LL black; DD dark brown, more or less mottled with yellowish, the limit between LL and DD as a yellowish oblique, slightly curved line, prolonging head coloration. Abdomen and rest of the thorax more or less mottled with yellowish, brown and black. Cerci dark brown. Legs yellowish, mottled with brown. Male FWs brown, shining; sternites and subgenital plate dark brown.

Measurements (in mm)
See Table 4.

REMARK
The male MNHN-EO-EO3556 fits the definition of *Monopteropsis acrophilus*, including for its genitalia (Fig. 6D-E). Another male MNHN-EO-EO3555, which has been collected at the same locality and elevation according to the labels, shows genitalia with longer and distally curved ectophallic apodemes (Fig. 6), which resembles the other species known in the genus, *M. vicinus*, described from specimens collected at lower elevation. The identity of this second specimen will have to be checked further.

TABLE 4. — Measurements (in mm) of *Monopteropsis acrophilus* de Mello and Jacomini, 1994 (male MNHN-EO-EO3556), and *Monopteropsis* sp. (male MNHN-EO-EO3555) Symbol: **, male of incertain specific identification.

	BL	iod	PrnL	PrnW	FW L	FIIIL	FIIIW	TIIIL	tars1-III
♂ EO3555 **	6.8	1.15	1.63	1.78	0.94	4.40	1.80	3.28	1.45
♂ EO3556	7	1.23	1.76	2.13	1.06	4.15	1.78	3.44	1.44

Genus *Phoremia* Desutter-Grandcolas, 1993
(Figs 7; 8; 9F-K; 10; 12)

Phoremia Desutter-Grandcolas, 1993: 34. — Mesa *et al.* 1999: 59. — Pereira *et al.* 2011: 31.

TYPE SPECIES. — *Phoremia tabulina* Desutter-Grandcolas, 1993.

OTHER SPECIES INCLUDED. — *Phoremia circumcincta* Mesa & Garcia, 1999; *P. nigrofaciata* Mesa & Garcia, 1999; *P. rolfsi* Pereira, Sperber & Lhano, 2011; *P. zefai* Perreira, Sperber & Lhano, 2011; *P. puracensis* n. sp., *P.* nr *puracensis* sp.

DIAGNOSIS. — See Desutter-Grandcolas (1993: 34).
Observations of several species of *Phoremia*, including the type species, show that inner subapical spurs of TIII can be inflated and concave, although with variable conditions (see Figs 9F-K; 10 and below for *P. tabulina*, *P. circumcincta*, *P. puracensis* n. sp. and *Phoremia* sp.).

DISTRIBUTION (Fig. 12). — Described from the Peruvian Amazonia (Desutter-Grandcolas 1993), this genus has been found in Brazil, i.e. in the states of Sao Paulo (Mesa *et al.* 1999) and Minas Gerais (Pereira *et al.* 2011). Colombian material was mentioned in Desutter-Grandcolas (1993) and is described below. An additional species remains to be described from Sao Paulo state (identified *Phoremia* sp. MNHN). *Phoremia* has not been found in French Guiana.

REMARK
Originally described in Nemobiinae without tribal assignation, *Phoremia* has been transferred to Pteronemobiini without argument (Otte 1994, catalogue), together with *Absonemobius* and *Hygronemobius*, although these three genera do not present a short and thick, supposedly glandular fourth inner subapical spur. The last two genera have been sorted out of the tribe, but *Phoremia* has been kept in the Pteronemobiini. Preliminary molecular phylogenies confirm the relationship of *Phoremia* with *Nemobius* (Faberon 2022). This genus is consequently moved here to Nemobiini.

Phoremia puracensis n. sp.
(Figs 7; 8; 9H, I; Table 5)

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TYPE LOCALITY. — Colombia, Dept. Cauca, Páramo de Puracé, 3450 m.

TYPE MATERIAL. — **Holotype. Colombia** • 1 ♂; Dept. Cauca, Páramo de Puracé, 3450 m; 23.II.1968; M. Descamps rec.; MNHN-EO-EO3626.
Allotype. Colombia • 1 ♀; same locality, collector, date and habitat as the holotype; MNHN-EO-EO3627.
Paratype. Colombia • 1 ♀; same locality, collector, date and habitat as the holotype; MNHN-EO-EO3628.

ETYMOLOGY. — Species named after its type locality.

DIAGNOSIS. — Within the genus, size relatively large compared to the type species of the genus, but similar to the Brazilian species of the genus, with relatively short ovipositor (Fig. 8B); species characterized by its shiny appearance, dark coloration with few light spots Figs 7A, B; 8A, B). In male, inner subapical spurs 1-3 short and strongly inflated at base (Fig. 9H, I); male genitalia with long and thin 'distal lobes' between the pseudepiphallic lateral lobes (Fig. 7D, E). In the male genitalia of *P. puracensis* n. sp., the sclerotization which prolonged the ectophallic apodemes posteriorly (a-ps.p.) allows to identify the long 'distal lobes' as the pseudepiphallic parameres (see Material and Method). The latero-apical lobes that prolonged the lateral pseudepiphallic sclerites correspond to the pseudepiphallic lateral lobes (l.l.), as in other nemobiine genera (*contra* Pereira *et al.* (2011)). This interpretation implies that the median lobes, that in other nemobiines face the pseudepiphallic plate dorsally, are here greatly reduced (see Fig. 7D-F).

DESCRIPTION
In addition to the characters of the genus:

Size, general coloration
Species of relatively large size (see measurements in Table 4) for the genus, with shiny appearance and dark coloration (Figs 7A; 8A, coloration much lighter in the male specimen than in the two females).

Coloration
Head shiny black, lighter in male holotype (Fig. 7C), cheeks and mouthparts lighter; a yellow line running from the inner mid-length of each eye toward occiput, and prolonged as an irregular band on lateral margin of pronotum DD, this yellow band prolonged obliquely toward and on DD posterior margin (Figs 7A; 8A, B); maxillary palpi brown, base and apex of articles 4 and 5 lighter; antennae light brown without rings. Pronotum LL black, lighter in the male holotype, shining;

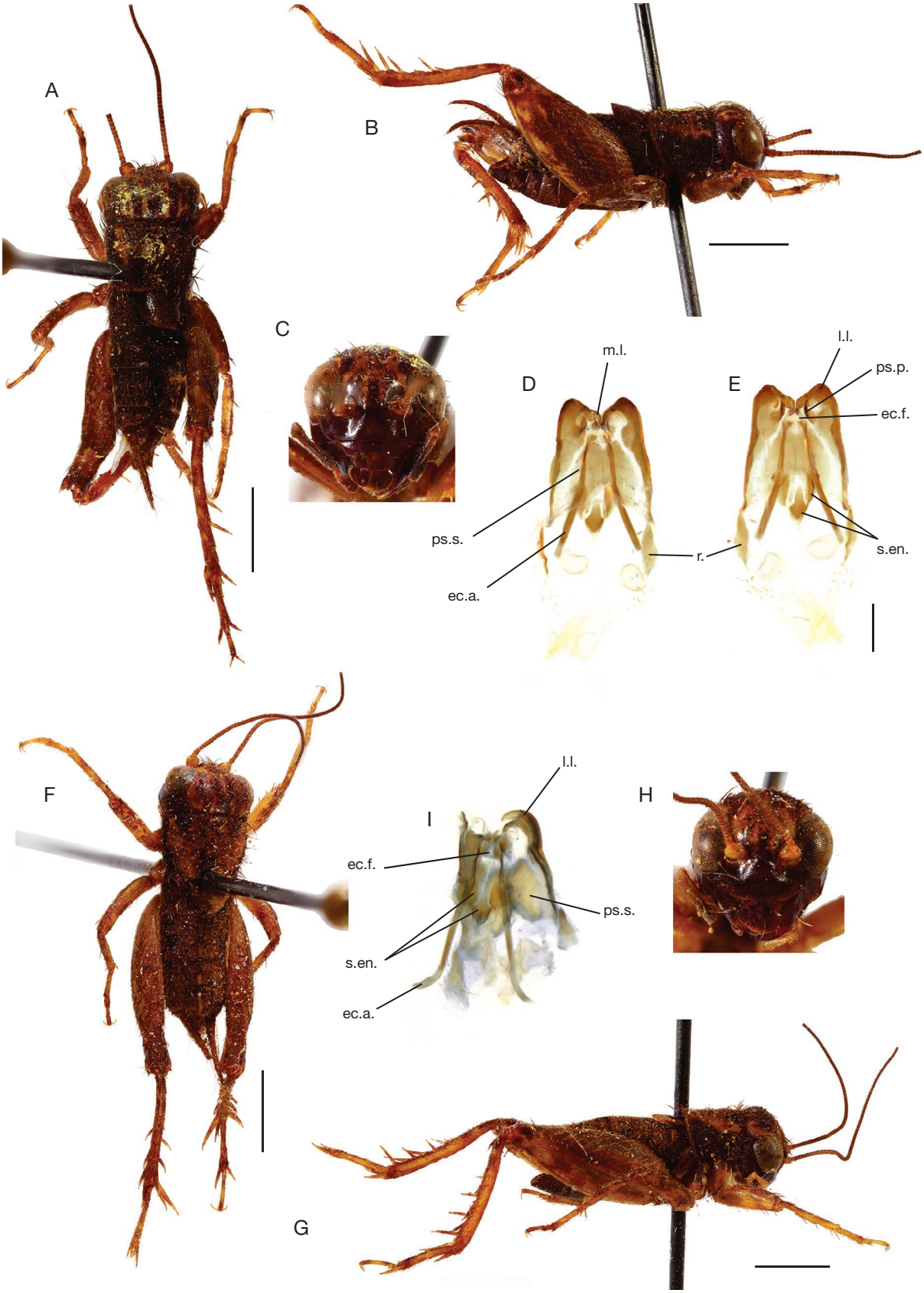


FIG. 6. — *Monopteropsis* de Mello & Jacomini, 1994, males MNHN-EO-EO3556 (**A**-**E**, identified *Monopteropsis acrophilus* de Mello & Jacomini, 1994) and MNHN-EO-EO3555 (**F**-**I**, identified *Monopteropsis* sp.): male habitus in dorsal (**A**, **F**) and side (**B**, **G**) views; **C**, **H**, face, not at scale; **D**-**E**, male genitalia of male EO3556, dorsal (**D**) and side (**E**) views; **I**, male genitalia of male EO3555, opened laterally, ventral view. Abbreviations: see Material and methods. Scale bars: A, B, F, G, 2 mm; D, E, I, 0.2 mm.

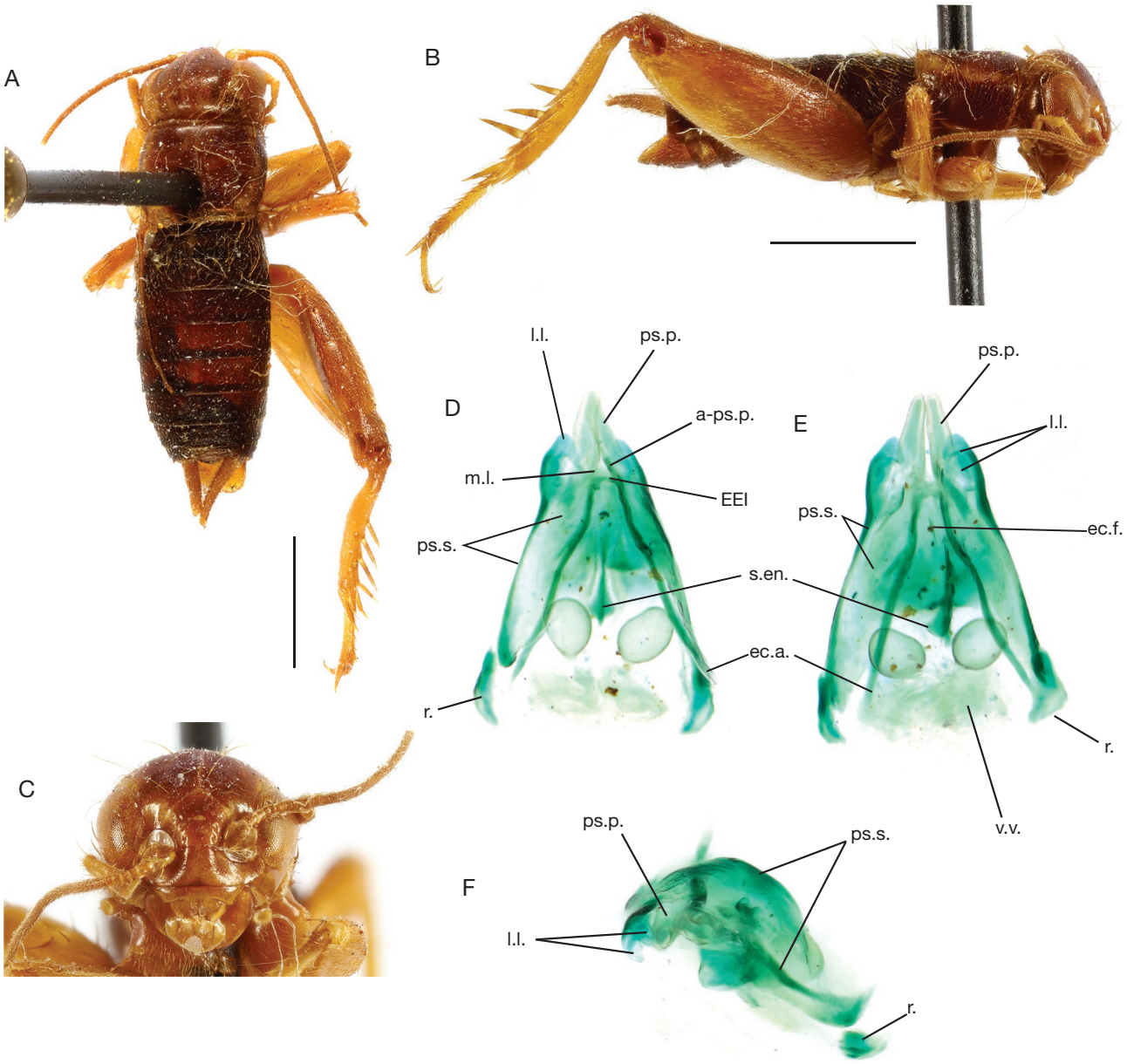


FIG. 7. — *Phoremia puracensis* n. sp., male holotype MNHN-EO-EO3626: **A**, **B**, habitus, dorsal (**A**) and lateral (**B**) view; **C**, face; **D**-**F**, male genitalia, dorsal (**D**), ventral (**E**), side (**F**) views. Abbreviations: see Material and methods. Scale bars: 2 mm.

anterior margin yellowish, other margins of LL light brown. Legs: femora dark brown, tibiae and tarsi yellowish; dorsal side of femora with light yellowish spots; FIII additionally yellowish on ventral inner and outer sides, with a large yellowish spot near the knee; TIII subapical and apical spurs light brown. Meso and metanotum and abdomen black with three rows of light-yellow spots, one row on each side, with the spots getting smaller toward abdomen apex, and one median row; cerci yellowish.

Male

TIII outer subapical spurs longer than inner subapical spurs, and thin over their whole length, osa3 > osa2 > osa1; TIII inner subapical spurs 1 to 3 and perhaps inner apical spur 2 (inner apical spur 3 missing in the only male available) inflated (Fig. 9H), with a small ventral concave area near their base (Fig. 9I).

TABLE 5. — Measurements (in mm) of *Phoremia puracensis* n. sp.

	BL	iod	PrnL	PrnW	FIIIL	FIIIW	TIIIL	tars1-III	OvpL
♂ Holotype	6.75	1.18	1.63	1.93	4.28	1.70	2.98	1.60	–
♀ Allotype	7.10	1.13	1.78	1.90	4.35	1.70	2.95	1.58	2.83
♀ Paratype	6.75	1.20	1.65	1.90	4.30	1.70	2.85	1.63	2.95

Male genitalia (Fig. 7D-F)
Similar to the other species of the genus, except for the very long pseudepiphallic parameres, which come up dorsally to prolonge the pseudepiphallic sclerite but originate from below the pseudepiphallic sclerite (Fig. 7E); these parameres reinforced laterally by a-ps.p.; pseudepiphallic medio-dorsal plate well-developed, with almost straight anterior and posterior margins (Fig. 7D); pseudepiphallic lateral lobes prolonging the pseudepiphallic lateral sclerites bifid (Fig. 7F); rami short and wide, well separate from the pseudepiphallic lateral sclerites (Fig. 7D). Ectophallic apodemes very long and thin, divergent anteriorly; EEI sclerotization well-developed and complete; ectophallic fold very short. Median endophallic sclerite particularly elongate and narrow (Fig. 7D), especially in its median part, bearing a crest-like endophallic apodeme (Fig. 7E); endophallic sclerite flanked by the two usual lateral pairs of sclerites seen in Nemobiinae, the inner one thin, narrow and quite elongate, the outer one very large.

Female (Fig. 8)
Sternites black brown, lighter on sides; a large yellowish spot on sternite 7. Subgenital plate yellowish, short and transverse; distal margin concave. Ovipositor short.

Measurements (in mm)
See Table 4.

Remarks
The coloration of *Phoremia puracensis* n. sp. is less contrasted in the male holotype, which has a globally lighter coloration; the yellow marks on the pronotum and the yellow lines behind the eyes can however be seen (Fig. 7A, B).

Four additional females originating from Colombia (label: Dept. Putumayo, San Francisco, 2300 m, 7.XI.1968, M. Descamps rec.) may represent a different species close to *P. puracensis* n. sp. from which they differ by their darker coloration (head without yellowish line on eye inner margins: Fig. 8D), five lines of yellow spots on meso-, metanotum and abdomen (Fig. 8D), and a longer ovipositor (mean value 3.46 mm versus 2.89 mm in *P. puracensis* n. sp.). They are referred to in MNHN collections as *Phoremia* n. sp. nr *P. puracensis*, with the collection numbers MNHN-EO-EO3629, EO3630, EO3631 and EO3632.

Phoremia circumcincta Mesa & Garcia, 1999
(Fig. 9J, K)

Phoremia circumcincta Mesa & Garcia, 1999: 59.

Type locality. — Brazil, Sao Paulo state, Salesópolis, Boracéia Biological Station, 23°40'06"S, 45°53'47"W.

Type material. — **Brazil** • 3 ♂, 1 ♀; Sao Paulo state, Salesópolis, Boracéia Biological Station, 23°40'06"S, 45°53'47"W; 23.VIII.1996 • 2 ♀; same locality; 16.XII.1996.

Material examined. — **Brazil** • 2 ♂; Sao Paulo State, Salesópolis, Station biologique de Boraceia, [23°40'06"S, 45°53'47"W]; forêt de brume, 800 m; de jour, litière; L. Desutter-Grandcolas rec.; 22.X.1992, fn 4, 5; MNHN-EO-EO3612, EO3614 • 1 ♂; same locality, habitat and collector; 23.X.1992, fn 15; MNHN-EO-EO3615 • 2 ♂, 1 juvenile; same locality, habitat and collector; 24.X.1992, fn 2, 1, 3, 4; MNHN-EO-EO3611, EO3616, EO3617, EO3625 • 2 ♂, 3 ♀, 1 juvenile; same locality, habitat and collector; 25.X.1992, fn 23, 24, 25, 26, 27, 28; MNHN-EO-EO3610, EO3613, EO3618, EO3619, EO3620, EO3624 • 1 ♀; same locality, habitat and collector; 26.X.1992, fn 9; MNHN-EO-EO3621 • 1 ♀; same locality and collector, herbaceous area; 23.X.1992, fn 23; MNHN-EO-EO3622 • 1 ♀; same locality and collector, herbaceous area; 27.X.1992, fn 8; MNHN-EO-EO3623.

Remarks
The male holotype (not identified among the three listed male types) and one female paratype kept at MZUSP; one male and one female paratypes to be sent at ANSP; rest of the specimens initially kept at UNESP (see Mesa *et al.* 1999: 60), later transferred to MZUSP.

The examined material fits perfectly the description of *P. circumcincta* for its morphology (including male genitalia) and originates from the type locality. Detailed observation of male TIII shows that the first and second inner subapical spurs of the males are inflated and concave, perhaps glandular (see Fig. 9J, K). By contrast, in male paratypes of *P. tabulina*, only the first inner subapical spur seems to be slightly concave ventrally, without being particularly inflated (see Fig. 9F, G).

DISCUSSION

All the nemobiine genera known from Mexico belong to the Pteronemobiini tribe, defined at least by the four pairs of subapical spurs and the supposedly glandular, short and thick, fourth inner subapical spur in males. Most pteronemobiines have wings and stridulate, except *Marcelonemobius*, which has short forewings without a stridulum. All have an elongate ovipositor, straight or slightly curved upwards, with variously ornamented valves. The discovery of *Mexiconemobius* n. gen., which is apterous and presents different conditions of subapical spurs, male genitalia and ovipositor, is thus a most valuable addition to the knowledge of the Mexican Nemobiinae.

The distributions of *Absonemobius* and *Phoremia* are also greatly extended by the new taxa described here, and may present significant differences: *Absonemobius* (Fig. 11) was known in western and eastern Amazonia, southern Central America and the Lesser Antilles; it is now also attested in northern South America (Colombia) and in Central America as far North as the Chiapas and Veracruz states in Mexico. It is not known from other South American forests such as the Atlantic Forest, which is an important center of endemism in South America (Costa *et al.* 2000; Thomé *et al.* 2010; Campos *et al.* 2021), nor in Central Amazonia or South of the Amazonian forest. This pattern could be modified in the future by the descriptions of additional species, as these very small nemobiines can easily remain unnoticed or mistakenly considered as juveniles even where they are abundant. By contrast, *Phoremia* is known in northern South America (Colombia, Eastern Peru) and well-diversified in south eastern Brazil, where at least five species have been discovered (Fig. 12). It

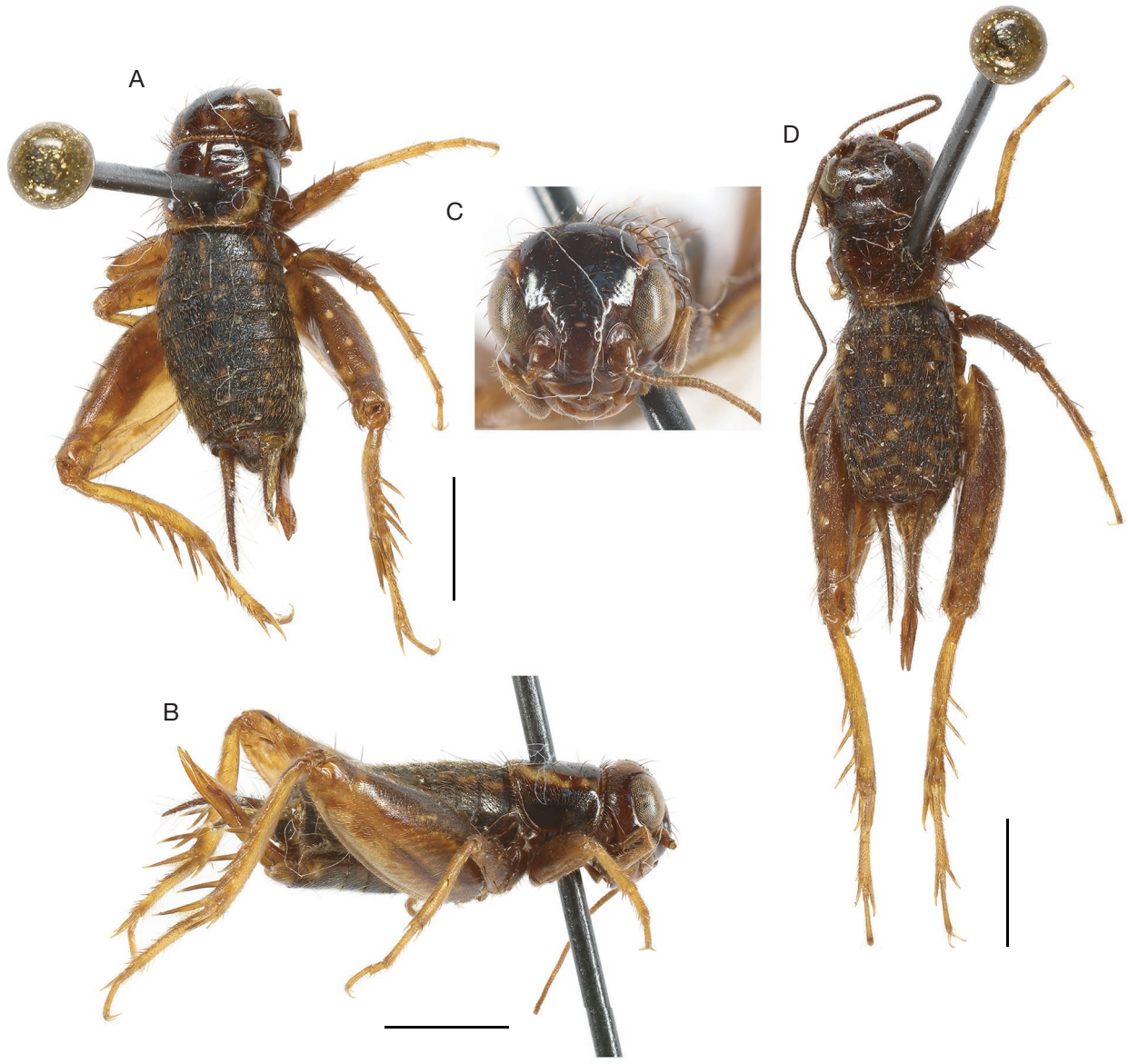


FIG. 8. — *Phoremia* Desutter-grandcolas, 1993 species: **A**-**E**, *Phoremia puracensis* n. sp., female allotype MNHN-EO-EO3627: **A**, **B**, dorsal and lateral view; **C**, face. *Phoremia* sp. nr. *puracensis* n. sp, female MNHN-EO-EO3631, **D**, dorsal view. Scale bars: 2 mm.

has not been collected in French Guiana, in spite of intensive sampling, including an expedition 'Our Planet Reviewed' in 2015 (Touroult *et al.* 2018), nor in Central America. Similarly, the distribution of *Phoremia* may also be expanded by future discoveries, particularly given that Central Amazonia region remain poorly sampled for crickets.

Such contrasting distributional patterns between morphologically similar, ecologically equivalent genera are not uncommon among Neotropical crickets. In the family Phalangopsidae Blanchard, 1845, *Eidmanacris* Chopard, 1956 and *Phalangopsis* Serville, 1831, both associated with humid forest floor microhabitats, including leaf litter, soil burrows, rock crevices and caves, show a comparable pattern: *Eidmanacris* species are restricted to the Atlantic Forest and gallery forests of the Cerrado and Chaco (Campos *et al.* 2021), whereas *Phalangopsis* species are distributed in northern South America within the Amazonian domain, although not present in western Amazonia (see Souza-Dias *et al.* 2022). Similarly, in the family Oecanthidae, *Tafalisca* Walker, 1869 and *Brazitrypa* Gorochov, 2011 (subfamily Tafaliscinae Desutter, 1988) are morphologically similar genera that share comparable microhabitats, being found on leaves and sheltering inside hollow twigs, yet their distributions are different: *Tafalisca* ranges across Amazonia, Central America and the Caribbean, while *Brazitrypa* is restricted to the Atlantic Forest (Campos *et al.* 2022; Cigliano *et al.* 2026).

At the Neotropical scale, including the Caribbean (Cigliano *et al.* 2026), only two nemobiine tribes are acknowledged, the Nemobiini and the Pteronemobiini. Two neotropical genera are presently classified in the Nemobiini, i.e., *Monopteropsis* and *Pepoapua* Jesus & Pereira, 2017. The Pteronemobiini appear by contrast more diversified, with species belonging

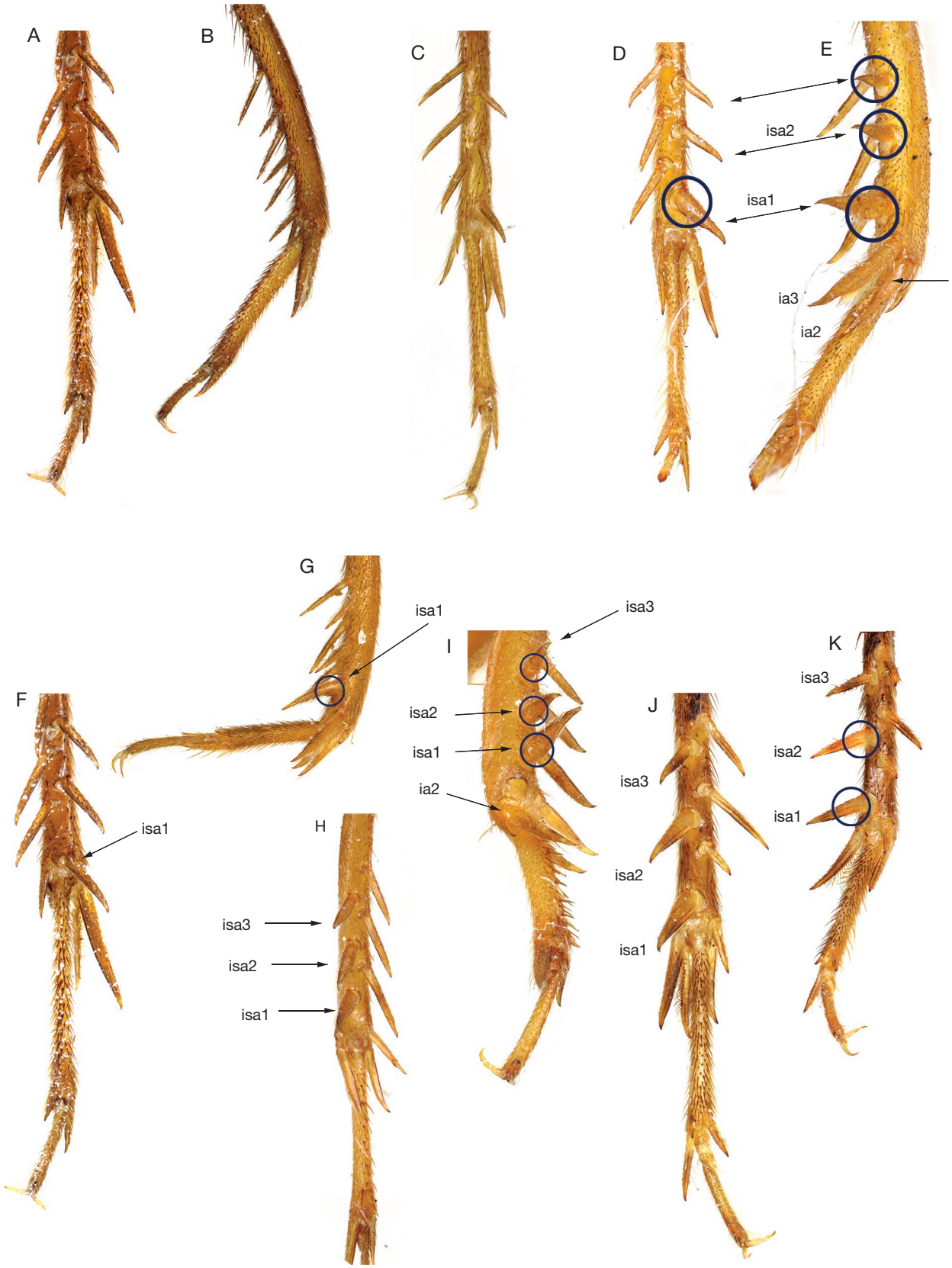


FIG. 9. — Comparisons of apical and subapical spurs in: **A**, **B**, *Mexiconemobius xalapaensis* n. gen., n. sp., male holotype MNHN-EO-EO3143, dorsal (**A**) and side (**B**) views; **C**, *Absonemobius tessellatus* Desutter-Grandcolas, 1993, male paratype MNHN-EO-ENSIF7851, dorsal view; **D**, **E**, *Absonemobius descampsi* n. sp., male holotype MNHN-EO-EO3633, dorsal (**D**) and side (**E**) views; **F**, **G**, *Phoremia tabulina* Desutter-Grandcolas, 1993, male paratype MNHN-EO-ENSIF8208, dorsal (**F**) and side (**G**) views; **H**, **I**, *Phoremia puracensis* n. sp., male holotype MNHN-EO-EO3626, dorsal (**H**) and side (**I**) views; **J**, **K**, *Phoremia circumcincta* Mesa & Garcia, 1999, male MNHN-EO-EO3613, dorsal (**J**) and side (**K**) views. Not to scale. Abbreviations: see Material and methods.

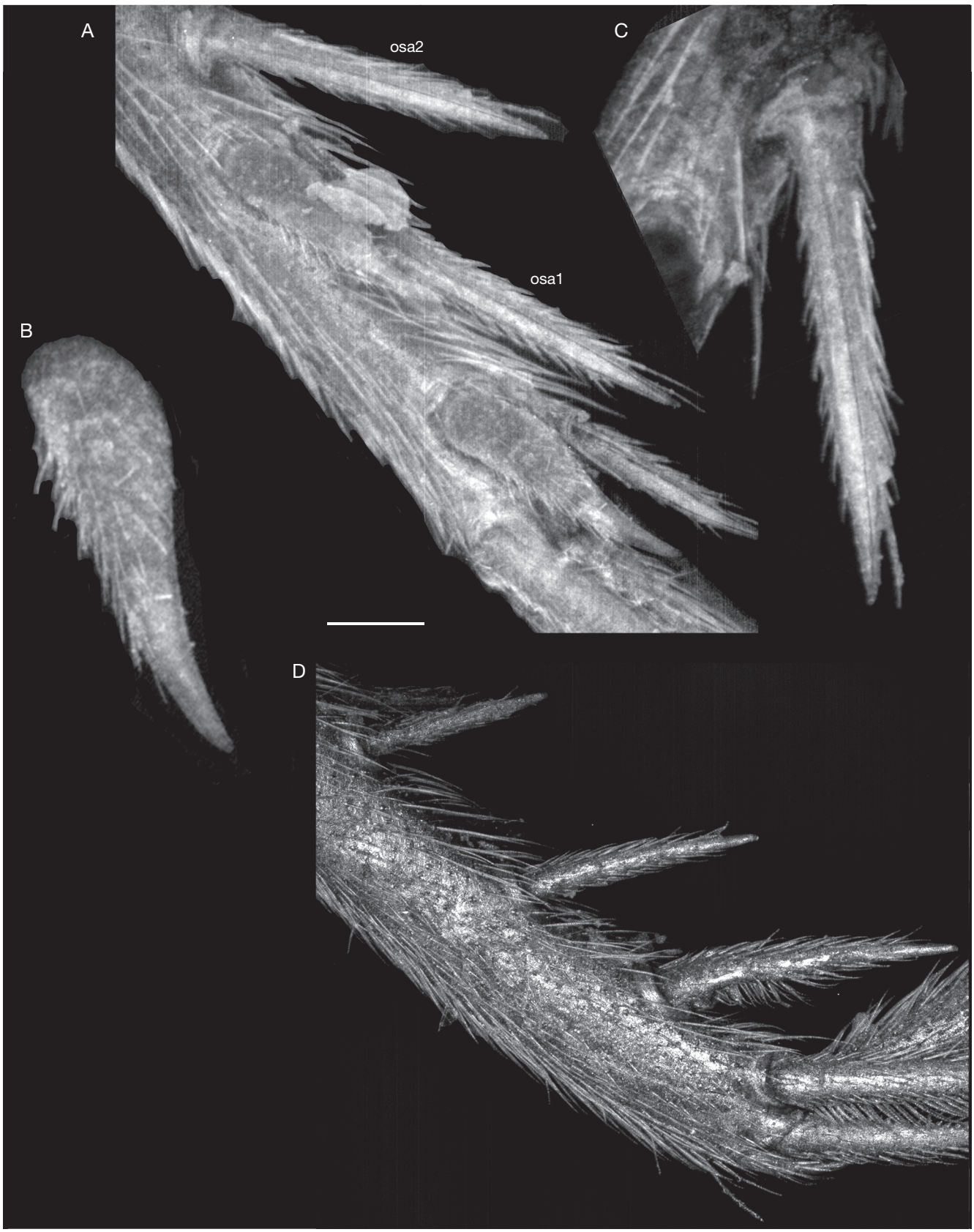


FIG. 10. — Subapical spurs of hind tibia in *Phoremia* sp., male MNHN-EO-EO3640 (**A**-**C**) and *P. tabulina* Desutter-Grandcolas, 1993, male paratype MNHN-EO-ENSIF8208 (**D**), showing subapical spurs in dorso-lateral (**A**) or lateral (**D**) views, and contrasting inner (**B**) and outer (**C**) subapical spurs. Abbreviations: see Material and methods. FFOCT images, scale bars: A, 200 µm; D, 300 µm; B, C, not to scale.

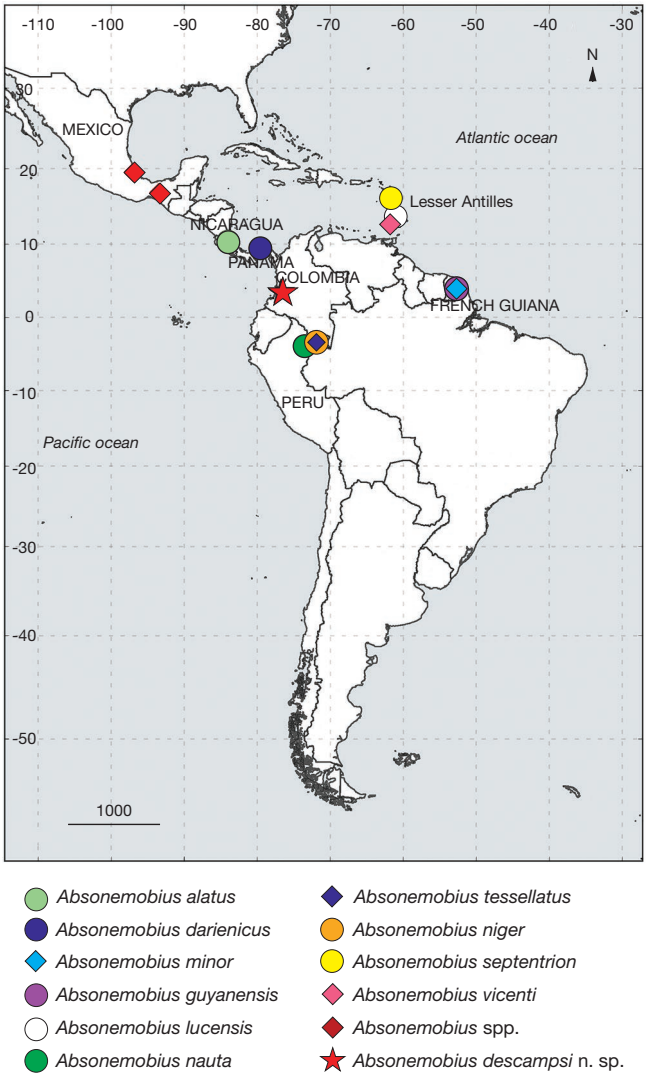


Fig. 11. — Distribution map of *Absonemobius* Desutter-Grandcolas, 1993 in the Neotropical Region.

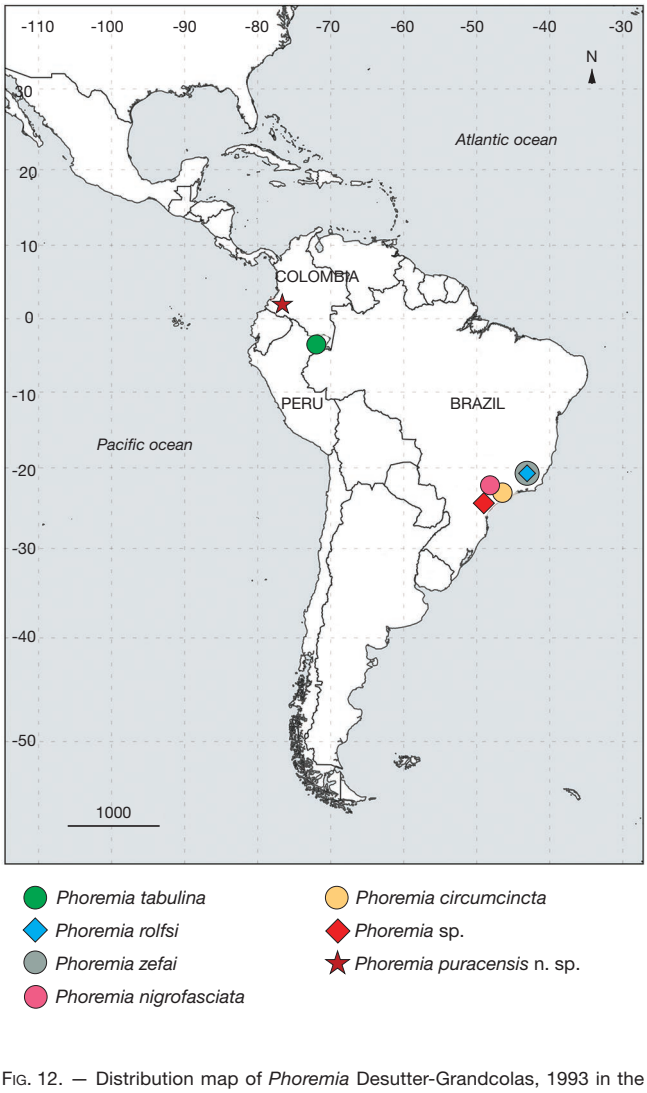


Fig. 12. — Distribution map of *Phoremia* Desutter-Grandcolas, 1993 in the Neotropical Region.

to *Amanayara* de Mello & Jacomini, 1994, *Argizala* Walker, 1869, *Kevanemobius* Bolfarini & Mello, 2012, *Neonemobius* Hebard, 1913, *Pepoyara* Mello & Capellari, 2012, *Phoremia* and *Pteronemobius* Jacobson, 1904, in addition to *Allonemobius* Hebard, 1913 (USA and Mexico), *Eunemobius* Hebard, 1903 (USA, species to be described from South America) and *Marcelonemobius* (Mexico). One species described in the genus *Nemobius*, i.e. *N. piracicabae* Piza, 1968, is recorded from Brazil (Sao Paulo, Piracicaba). The large size, and relative sizes, of TIII subapical spurs of *N. piracicabae* female type specimen shows however without doubt that this specimen belongs either to the Pteronemobiini, or to the genus *Hygronemobius* (see https://orthoptera.speciesfile.org/otus/833531/overview): the presence vs absence of the first inner apical spur of TIII could help identifying this species. Several Neotropical genera are presently not classified within a definite tribe. This is the case of *Absonemobius* Desutter-Grandcolas, 1993, *Hygronemobius* Hebard, 1913, *Pineronemobius* Yong, 2018, and *Zuchiella* de Mello, 1990. Apart from male genitalia, one of the main characters used today in the classification of the nemobiines is the number of TIII subapical spurs and the presence of the supposedly glandular isa4 in males. As already discussed by Hugel & Desutter-Grandcolas (2021) for the Burcini, these characters should be considered with caution. The close similarity of male genitalia of *Absonemobius* and *Zuchiella*, with three and four pairs of subapical spurs respectively, is a good example in this matter: both would be classified in different tribes according to spur numbers, and the discovery of deeply modified, perhaps glandular subapical spurs in *A. descampsi* n. sp., while they are absent in the type species of the genus, is a real issue. As a matter of fact, de Mello (1990) proposed to classify *Zuchiella* in the Nemobiini when he described this genus, because of the lack of the short and thick, supposedly glandular subapical spur 4, whatever the number of subapical spurs on TIII. Pereira *et al.* (2011) considered *Zuchiella* close to *Phoremia*, here also with different combinations of subapical spurs, but *Phoremia* is presently in the Pteronemobiini. If the presence of a 'glandular' inner subapical spur 4 on TIII could

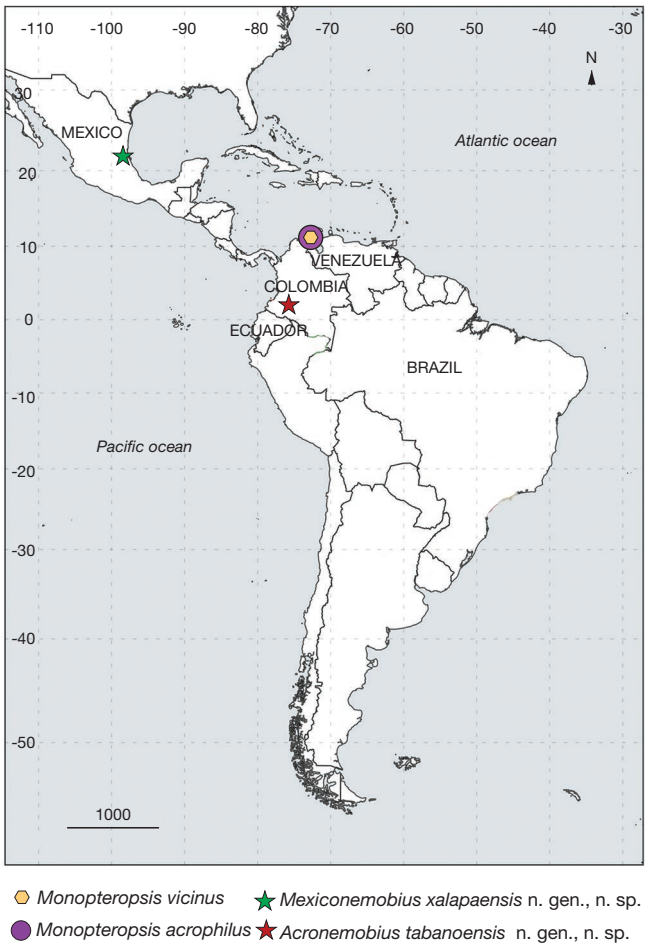


Fig. 13. — Distribution map of *Monopteropsis* & Jacomini, 1994, *Mexiconemobius* n. gen and *Acronemobius* n. gen. in the Neotropical Region.

be a strong character to define the Pteronemobiini, the lack of this structure may be more delicate to evaluate: as usual in evolutionary biology, the lack of a structure can be a plesiomorphic condition or the result of a disappearance, and this can be solved only through a large-scale phylogenetic analysis and applying comparative phylogenetic methods. Without a phylogeny, it sounds reasonable to classify together only the taxa that present the given structure. In the present case, if Pteronemobiini are defined using the 'glandular' fourth inner subapical spur, *Phoremia* should not be classified in this tribe. Acording to preliminary phylogenetic analyses (Faberon 2022), we propose to move *Phoremia* to the Nemobiini.

It is here interesting to note that while a thick and short, 'glandular', isa4 could be a constant feature of the Pteronemobini, or at least some of its members, a large variation is observed for the inner subapical spurs 1 to 3: we have shown here different conditions in species of *Absonemobius* and *Phoremia*, but the first inner subapical spur is also qualified as glandular in some Pteronemobiini, as signaled by Hebard (1913) and shown by Bolfarini *et al.* (2012) in *Kevanemobius*, this spur 'bearing vestiges of a ventral gland (more developed in *Amanayara* and *Pepoyara*)' (Bolfarini *et al.* 2012: 20), i.e. being concave ventrally at its base (Bolfarini *et al.* 2012, figure 4H). The taxonomic distribution of such long and inflated subapical spurs, which could functionally be very different from the short and thick isa4 chewed by the female during mating, could actually be much larger than previously thought, at the scale of crickets. They exist for example in the grylline *Gialaia strasbergi* Hugel, 2014 from Mauritius, which inner subapical spurs are greatly inflated, especially isa2 and 3 (see Hugel 2014, figures 11, 14). These observations call for a reappraisal of supposedly glandular structures in crickets, ideally with information about habitat and mating sequences, to test a hypothesis of functional convergence. Mating has been observed in few nemobiines, i.e. *Allonemobius* spp (Mays 1971, Paul 1975; Bidchoka & Snedden 1985; Fedorka & Mousseau 2002; Sadowski *et al.* 2002), *Nemobius sylvestris* (Bosc, 1791) (Gabbutt 1954; Mays 1971; Campan & Demai 1983), *Bobilla victoriae* (Evans 1988), *Hygronemobius alleni* (Mays 1971), *Neonemobius* sp. (Mays 1971; Forrest *et al.* 1991), *Dianemobius csikii* (Bolivar, 1901) (Kuriwada 2024), or *Eunemobius carolinus* (Scudder, 1877) (Mays 1971; Piascik *et al.* 2010), and behavioral information remains scarce. As to *Gialaia strasbergi*, this species is known to dig underground burrows, but its mating sequence is not yet documented (Hugel 2014). The glandular nature of all these spurs should anyway be reinvestigated, because neither the documented structures of the spurs, nor the role of 'hemolymph pump' documented by Di Rienzo & Marshall (2013) for isa4 in a pteronemobiine, can fully support this hypothesis. Inflated, basally concave spurs, very similar to those shown here, have been found in other insect orders, where they may have varied functions, such as grooming via antenna cleaning in some ants (Hackmann *et al.* 2015).

Whatever their classification, Nemobiinae are most diversified in two parts of the World: the Neotropics and New Caledonia. For comparison, studies available today for other regions recorded nine genera in Australia (Otte & Alexander 1983), two in Hawaii (Otte 1994), or 12 genera in China (He *et al.* 2021), even though the definitions of the genera may bias these evaluations. In the Neotropics, 13 genera among the 18 now reported from the Region are endemic to the Neotropics (Table 6). This diversification is evident when the morphological characters of these taxa are analyzed, especially the forewing and spurs conditions, and of course male genitalia. The habitats of these taxa seem however relatively homogenous, most of these taxa living in the leaf litter of forested areas. The nemobiines described in the present paper from the Andean Páramos, up to 3450 m a.s.l., may have particular habitat and life habits, owing to specificities of these high-mountain 'islands' and to their past histories (Hoorn *et al.* 2010; Flantua *et al.* 2019): these taxa may actually reveal a yet unknown cricket diversity. As an example, *Acronemobius tabanoensis* n. gen., n. sp., *Monopteropsis acrophilus* and *Phoremia puracensis* n. sp. are comparatively larger than their relatives, and at least the first two show particularly large heads, much larger than the anterior margin of their pronotum. Size is supposed to diminish with altitude (Somme 1989), but ground crickets may be exceptions to this rule.

TABLE 6. — Neotropical Nemobiinae according to Cigliano *et al.* (2026), except for *Phoremia* Desutter-Grandcolas, 1993, moved to Nemobiini, and including taxa described in the present paper. **NC**, not classified; *****, exclusively Neotropical; **@** / **-**, presence / absence of a short and thick inner subapical spur 4 on TIII; **(F)**, taxon known by female only.

Tribe	Genus	Species	Distribution	TIII sa
NC	*Absonemobius**	12	Peru, French Guiana, Panama, Costa Rica and Mexico	3 : 3 -
	*Acronemobius** n. gen.	1	Colombia	3 : 3 (F)
	Hygronemobius	32	Central America, South America, Caribbean, USA (Florida State).	3 : 3 -
	*Mexiconemobius** n. gen.	1	Mexico	3 : 3 -
	*Pineronemobius**	1	Cuba	3 : 3 -
	*Zucchiella**	2	Brazil	4 : 4 -
Nemobiini	*Monopteropsis**	2	Colombia	4 : 3 -
	*Pepoapua**	1	Brazil	4 : 3 -
	*Phoremia**	7	Brazil, Peru and Colombia	3 : 3 -
Pteronemobiini	*Allonemobius*	10	North America?	4 : 4 @
	*Amanayara**	5	Brazil	4 : 4 @
	*Argizala**	2	Argentina, Brazil, Ecuador and Peru	4 : 4 @
	Eunemobius	4	North America and Trinidad and Tobago	4 : 4 @
	*Kevanemobius**	1	Brazil	4 : 4 @
	*Marcelonemobius**	1	Mexico	4 : 4 @
	Neonemobius	6	North America and Caribbean	4 : 4 @
	*Pepoyara**	1	Brazil	4 : 4 @
	Pteronemobius	96	Worldwide	4 : 4 @

The situation is well-different in New Caledonia, where the number of taxa is also very high for this small, isolated archipelago, but where the taxonomic diversity is built on a unique ecological diversity related to the habitats of the taxa (Desutter-Grandcolas *et al.* 2016), including some 'large-headed' taxa or even a species with long facial horns. Understanding these ecological disparities will require a solid phylogenetic reference, and no hypothesis can be proposed today to explain them. While considered for a long time as a minor, homogenous clade, the Nemobiinae may well become a surprising model group when the history of this clade will be studied in a proper historical frame.

Acknowledgements
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