

A new genus and species of Neotropical Nemobiinae (Insecta: Orthoptera: Grylloidea: Trigonidiidae)

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Abstract

A new genus and a new species of Neotropical cricket are described: *Pepoapua cariacica* **n. gen., n. sp.**, occurring in four Atlantic Forest remnants in the states of Bahia and Espírito Santo, Brazil. This new genus presents morphological proximity of external characteristics and both male and female genitalia, with two other Neotropical genera of Nemobiinae: *Amanayara* and *Kevanemobius*. The combination of external morphological characteristics, along with male genitalia, characterize a new genus through combination of the following characters: (i) males and females with morphologically similar tegmina; (ii) tegmina reduced, not reaching half of the second abdominal segment; (iii) dorsal field of the tegmina with parallel veins, without stridulatory vein or any specialized area for sound production; (iv) tibia of the first pair of legs without tympanum; (v) tibia of the third pair of legs with seven dorsal spurs, four inner and three outer, the proximo-dorsal inner spur reduced in size and the disto-dorsal inner spur without glandular aspect; (vi) ovipositor with distal portion of the dorsal and ventral valves serrated; (vii) male genitalia without evident bristles or sensillas; (viii) pseudepiphallic median lobe presenting apical and ventral projections.

Key words: taxonomy, crickets, genitalia, Brazil, forest litter.

Introduction

There are currently approximately 25 thousand described species in the order Orthoptera (Cigliano *et al.* 2017), which is traditionally divided into two suborders: (1) Caelifera (Acridomorpha, Tetrigoidea and Tridactyloidea) and (2) Ensifera (Grylloidea, Gryllotalpoidea, Hagloidea,

Rhaphidophoroidea, Stenopelmatoidea, Schizodactyloidea and Tettigonioidea) (Cigliano *et al.* 2017).

Among the Grylloidea, the subfamily Nemobiinae was described by Saussure (1877) as “*Némobiites*” and is considered a subfamily of Gryllidae. Since then the group formed by Nemobiinae crickets has been transferred to different taxa and has received the status of family (Bruner 1916, “*Nemobiidae*”), afterwards was considered a subfamily in Gryllidae (Chopard 1956; Otte 1994) and a tribe in Gryllinae (Chopard 1967). Vickery & Johnstone (1970) stated their disagreement with the proposal of Chopard (1967), which ranked Nemobiinae as a tribe (Nemobiini). Vickery & Johnstone (1970), however, did not present taxonomic justification for keeping Nemobiinae as a subfamily of Gryllidae, arguing only that the differences that exist between Nemobiinae and Gryllini are much greater than those between Gryllini and other tribes of Gryllidae.

All these proposals of taxonomic relationships are based principally on external characters that are not exclusive of this taxon (loss of the serrated structure at the base of tibia of the third pair of legs and the absence of adhesive pads in the second tarsal segment). Desutter (1987; 1990) did a morphological analysis of the genitalia of the Neotropical and Nearctic genera and suggested the grouping of Nemobiinae and Trigonidiinae in a single family, thus confirming the theory of Gorochov (1986), that proposed the proximity of these two groups. Desutter (1987; 1990) cites characters of external morphology (*e.g.*, tibia of the third pair of legs not serrated, first tarsomere of the posterior tarsus without dorsal spines, ovipositor laterally flattened), which according to Desutter (1987; 1990), approximates Nemobiinae to Trigonidiinae. Some researchers, however, maintained Nemobiinae and Trigonidiinae as subfamilies of Gryllidae (Otte 1994; Cigliano *et al.* 2017). Recently, a phylogeny with molecular data (Chintauan-Marquier *et al.* 2015) confirmed the proposals of Gorochov (1986) and Desutter (1987; 1990), keeping Nemobiinae together with Trigonidiinae in Trigonidiidae.

According to Desutter (1987; 1990, modified by Desutter-Grandcolas (2003)), the genitalia of male Nemobiinae is characterized by the lateral-ventral migration of the median lobes and consequent regression of the pseudepiphallic parameres, absence of ectophallic arch, prolongation of the sclerification of the ectophallic apodemes, along the ectophallic fold, and presence of a little developed endophallic apodeme. Apart from these characteristics, the trend of the disconnection between the rami and the pseudepiphallus may be added (*e.g.* Grylliscini in Gorochov (1986); *Hygronemobius* in Desutter-Grandcolas (1993)), which may result in increased pseudepiphallus flexibility (Gorochov 1986).

According to Cigliano *et al.* (2017), there are currently 329 described species of Nemobiinae distributed in 55 genera and five tribes. In the literature, there has been no review of Nemobiinae that organizes the subfamily into tribes, but Vickery (1973) proposes the creation of two distinct tribes, Pteronemobiini and Nemobiini, based on the presence or absence of the glandular spine in the dorsal superior-inner region of the tibia of the third pair of legs. Gorochoy (1985) proposed the creation of Marinonemiini, and later on, in 1986, created a monotypical tribe, Grylliscini (Gorochoy 1986). Otte & Alexander (1983) also added a new tribe to the subfamily, Thetellini. Although some authors have defined five tribes for Nemobiinae, there is no consensus regarding their use, with these tribes being not considered in any descriptions of genera, *e.g.* in Desutter-Grandcolas (1993), Rentz & Su (1996). De Mello (1990) and De Mello & Jacomini (1994) placed two of the three genera described in their works (*Amanayara* and *Zucchiella*) in tribes, but did not mention a tribe for *Monopteropsis*.

Among the 55 genera described for Nemobiinae, only 13 have occurrence confirmed for the Neotropical region: *Argizala* (Walker 1869), *Allonemobius* (Hebard 1913), *Amanayara* (De Mello & Jacomini 1994), *Absonemobius* (Desutter-Grandcolas 1993), *Hygronemobius* (Hebard 1913), *Monopteropsis* (De Mello & Jacomini 1994), *Pteronemobius* (Jacobson & Bianchi 1904), *Phoremia* (Desutter-Grandcolas 1993), *Zucchiella* (De Mello 1990), *Eunemobius* (Hebard 1913), *Nemobius* (Audinet-Serville 1838), *Neonemobius* (Hebard 1913), *Pepoyara* (De Mello & Capellari 2012), *Kevanemobius* (Bolfarini & De Mello 2012). Among these genera, *Allonemobius*, *Eunemobius*, *Neonemobius* and *Monopteropsis* do not present confirmed occurrence in Brazil.

In this work we described a new genus and a new species of cricket belonging to the subfamily Nemobiinae and recorded its occurrence in four remnants of Atlantic Rainforest in the states of Bahia and Esp rito Santo, Brazil.

Materials and Methods

Cricket sampling

The specimens were collected from four Atlantic Rainforest remnants (Fig. 1A), all of them protected areas: Reserva Biológica Augusto Ruschi, municipality of Santa Tereza, state of Espírito Santo (ES) (19°54'23.81"S, 40°33'29.37"W, Fig. 1B), Estação Biológica de Santa Lúcia, municipality of Santa Tereza, ES (19°58'6.98"S, 40°32'22.56"W, Fig. 1C), Parque Nacional do Monte Pascoal, municipality of Itamaraju, state of Bahia (BA) (16°53'17.33"S, 39°24'54.89"W, Fig. 1D) and Reserva Biológica de Duas Bocas, municipality of Cariacica, ES (20°16'19.05"S, 40°28'42.53"W, Fig. 1E).

The collections were done using pitfall traps (plastic pots 15 cm in diameter and 18 cm deep that remained in the field for 48 hrs, with a lethal solution of combustible alcohol according to the methodology of Szwedowski *et al.* (2012), and manually during the day with the help of a plastic pot, always at the level of leaf litter. All crickets collected with manual sampling were transferred to plastic bags where they received a high concentration of CO₂ before being fixed in 80% alcohol. These collections were authorized by the Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio): licenses Sisbio n° 31324 and 37717.

Photographs, drawings, abbreviations and nomenclature

The holotype and paratypes (female and male) were described and photographed with the help of a stereomicroscope Zeiss V20 (motorized) equipped with 0.3x, 1.0x and 1.5x objectives. The photographs were acquired with the "*Multidimensional acquisition*" function with the software *Axio Vision*, which allows for performing a series of photographs with different focal planes. Afterward, all of the photographs were combined into a single image through the "*Extended focus Z*" function. For the coloration description, the tonality of each color was divided into two categories: clear and dark.

The description of masculine genitalia was based on paratypes, without the need to dissect the holotype. After extraction, some genitalia were kept in an aqueous solution of KOH 10% to lighten and remove muscles and membranes. All of the genitals were also photographed with different focal planes and combined into a single image. The measurements were done on the stereomicroscope Zeiss V20 with the help of the above-cited image processing software. The following abbreviations were used in this work: BL – body length, measured from the fastigium to

the posterior edge of the supranal plate; MID – minimum inter-ocular distance; PL – length of pronotum along dorsal median line; WP – maximum width of pronotum, dorsally measured; MLF – maximum length of posterior femur, measured on external face; MLT – maximum length of the tibia of the third pair of legs, measurement on external face; MTL – maximum length of tegmen, measured on dorsal surface; MTW – maximum tegmen width; OL – ovipositor length, measured laterally, from above sclerotized subgenital plate up to ovipositor apex.

We adopted the proposals of Gorochov (1986), Desutter (1987; 1990) and Chintauan-Marquier *et al.* (2015) for classification, in which Nemobiinae is included in Trigonidiidae. The nomenclature used in the characterization of masculine genitalia was that proposed by Desutter (1987; 1988) with modifications in Desutter-Grandcolas (2003).

The holotype (male) and the paratypes will be deposited at the Museu de Zoologia da Universidade de São Paulo, São Paulo, Brasil (MZUSP).

Results

Taxonomy

Order ORTHOPTERA Olivier, 1789

Suborder ENSIFERA Chopard, 1921.

Superfamily GRYLLOIDEA Laicharting, 1781

Family TRIGONIDIIDAE Saussure, 1874

Subfamily NEMOBIINAE Saussure, 1877

Tribe NEMOBIINI Vickery, 1973

Pepoapua Jesus & Pereira **n. gen.**

(Figs. 2–5)

Type species. *Pepoapua cariacica* Jesus & Pereira **n. sp.**

Etymology. “*Pepoapua*” (pronounced /pepəapu:ɑ/), a compound of two words from the native South American Tupi-Guarani language. “*Pepó*” means wing and “*apu’a*” means short. Name given in allusion to the fact that the species here described presents short wings.

Diagnosis. This new genus is characterized by the combination of the following characters: (i) males and females with morphologically similar tegmina (Figs. 2A, B, D; 3A and 5A, B, D); (ii) tegmina reduced, not reaching half of the second abdominal segment (Fig. 2A, B, D); (iii) dorsal

field of the tegmina with parallel veins, without stridulatory vein or any specialized area for sound production (Fig. 3A); (iv) tibia of the first pair of legs without tympanum; (v) tibia of the third pair of legs with seven dorsal spurs, four inner and three outer (Fig. 3C), the proximo-dorsal inner spur reduced in size (Fig. 3C, D) and the disto-dorsal inner spur without glandular aspect (Fig. 3C); (vi) ovipositor with distal portion of the dorsal and ventral valves serrated (Fig. 5G–I); (vii) male genitalia without evident bristles or sensillas (Fig. 4); (viii) pseudepiphallic median lobe presenting apical and ventral projections (Fig. 4A, C, D, F).

Description. Small size (≤ 6 mm). Head as wide as pronotum (Fig. 2A), covered by long semi-erect dark brown bristles on fastigium, vertex and occiput; presence of thin bristles covering its entire length; black and prominent eyes (Fig. 2A–D); three ocelli present; 5-segmented maxillary palps, with the third being larger than the first and second, but smaller than the fourth and fifth palpomere (Fig. 2D); fifth palpomere with rounded apex (Fig. 2D). Pronotum wider than long, covered with long and fine bristles of dark brown coloration; anterior and posterior edges with a row of long dark brown bristles (Fig. 2A, B, D); lateral lobes as in Figure 2D; tegmina reduced, with parallel veins and without specialization (Figs. 2A and 3A); posterior wings absent; tympanum absent; tibia of the first pair of legs with an apical spur; tibia of the second pair of legs with two apical spurs; tibia of the third pair of legs with seven dorsal spurs, being four inner and three outer (Fig. 3C), the proximo-dorsal inner spur reduced in size (Fig. 3D) and the disto-dorsal inner spur without glandular aspect (non-specialized) (Fig. 3C); presence of three inner and three outer apical spurs, with the median spur being larger in size on the outer face (Fig. 3F, "o.m") and the superior spur being larger in size on the inner face (Fig. 3G, "i.s"). Male genitalia: bristles or sensillas absent (Fig. 4); pseudepiphallic median lobe presenting apical and ventral projections (Fig. 4A, C, D, F); endophallus divided in three sclerites, being one central and two laterals (Fig. 4A, D); rami fused with pseudepiphallus (Fig. 4A, C, D, F). Ovipositor flattened laterally, dorsal and ventral valves serrated in distal portions (Fig. 5G–I).

Pepoapua cariacica Jesus & Pereira **n. sp.** (Figs. 2–5)

Etymology. The specific epithet refers to the type locality, the municipality of Cariacica.

Occurrence. Reserva Biológica de Duas Bocas (20°16'19.05"S, 40°28'42.53"W), Cariacica, Espírito Santo state, Brazil.

Diagnosis. This species may be distinguished by the combination of the following characters: (i) apical projection of the pseudepiphallic median lobe longer than wide and with curved end (Fig. 4C, F); (ii) ventral projection of the pseudepiphallic median lobe directed to the median portion of the genitalia (Fig. 4A, D); (iii) pseudepiphallic apical lobe with sub-straight posterior and anterior edges (Fig. 4B, E); (iv) pseudepiphallic sclerite without evident dorsal slit (Fig. 4B, E).

Description: Holotype, male, measurements (mm): BL: 4.98; MID: 0.68; PL: 1.02; WP: 1.38; MLF: 2.99; MLT: 2.11; MTL: 0.64; MTW: 0.9. **Head** dark brown, covered with long semi-erect dark brown bristles on its median region, presence of thin bristles covering its entire extension (Fig. 2A, B, D); presence of a light yellow spot between lateral ocelli and eyes (Fig. 2D); black and prominent eyes (Fig. 2A, B, D); three ocelli present; antennal scape light brown, antennomeres light yellow; front and gena dark brown; mandible light brown with dark brown edges; clypeus whitish with upper portion light brown; labrum whitish; maxillary and labial palps white, maxillary palps with third palpomere greater than the first and second, but smaller than the fourth and fifth (Fig. 2D); fifth palpomere with rounded apex (Fig. 2D). **Thorax** (Fig. 2A, B, D) pronotum wide than long; dark brown coloration, without apparent spots; presence of thin and short bristles covering its entire extension; row of dark brown bristles, semi-erect and densified at their anterior and posterior edges; bristles also present, spaced out, over the entire extension; lateral lobes as in Figure 2D; metanotum without any evidence of glands. Tegmina (Figs. 2A, B, D and 3A, B) reduced, with parallel veins and without specialization; posterior wings absent. Prosternum and mesosternum with central portion light yellow, anterior and lateral edges dark brown (Fig. 2C); metasternum light yellow. First pair of legs with trochanter, coxa and femur light brown; tibia light yellow, without tympanum and with one apical spine; femur and tibia with the presence of long black bristles; tarsomeres light yellow. Second pair of legs with trochanter, coxa and femur light brown; tibia light yellow, with two apical spines; femur and tibia with bristles similar to anterior leg; tarsomeres light yellow. Third pair of legs with trochanter, coxa and femur light yellow, femur with presence of some black bristles on dorsal and ventral surface (Fig. 2A, B); tibia light yellow with seven dorsal spurs, being four inner and three outer (Fig. 3C), where the inner proximo-dorsal spur reduced (Fig. 3D); three inner and three outer apical spurs, with the median spur being the largest on the outer face (Fig. 3F, "o.m"), and the superior spur being the largest on the inner face (Fig. 3G, "i.s"); the two ventro-apical spurs, the inner and outer, with equal length (Fig. 3E, arrows); tarsomeres light yellow (Fig. 3F). Tarsal claws on all the legs with light yellow coloration. **Abdomen** (Fig. 2A, B) with dark brown tergites. Cerci light yellow (Fig. 2A–C). Supranal plate whitish, with light brown spot on the central portion, light brown lateral edges and rounded posterior edge (Fig. 3H). Sternites

light brown (Fig. 2C). Subgenital plate light brown, with sub-straight posterior edge (Fig. 3I). **Male paratype genitalia:** Bristles or sensillas absent (Fig. 4). Apical projection of the pseudepiphallic median lobe longer than wide and with curved end (Fig. 4C, F); pseudepiphallic sclerite without evident dorsal slit (Fig. 4B, E); ventral projection of the pseudepiphallic median lobe directed to the median portion of the genitalia (Fig. 4A, D). Ectophallic fold evident and not surpassing the pseudepiphallic parameres (Fig. 4A, D). Endophallus divided into three sclerites, one central and two laterals (Fig. 4A, D); endophallic sclerites forming a shell-shaped structure, in ventral view (Fig. 4A, D); endophallic lateral sclerites without evident prolongations on external edges (Fig. 4A, D). **Female** (Fig. 5A–I): body shape similar to male, presenting the following differences: abdominal sternites light brown, with lateral thirds light yellow (Fig. 5C). Subgenital plate light brown, with rounded posterior edge and with invagination in its central portion (Fig. 5F). Ovipositor laterally flattened (Fig. 5G–I) with length shorter than the posterior femora (Fig. 2B); dorsal and ventral valves varying from light yellow in their proximal portion to light brown on their distal edge; distal portion of dorsal and ventral valves serrated; dorsal valve with two rows of denticles of different size (Fig. 5G, I).

Measurements (mm). Males (n=6, including holotype): BL 4.87–5.00 (4.94 ± 0.05); MDI 0.62–0.7 (0.66 ± 0.03); PL 0.98–1.02 (1.0 ± 0.02); WP 1.24–1.4 (1.35 ± 0.07); MLF 2.9–3.0 (2.97 ± 0.04); MLT 2.09–2.15 (2.13 ± 0.05); MTL 0.64–0.69 (0.66 ± 0.02); MTW 0.8–0.92 (0.88 ± 0.04). **Females** (n=5): BL 4.88–5.10 (4.98 ± 0.08); MDI 0.68–0.72 (0.70 ± 0.02); PL 0.98–1.09 (1.04 ± 0.05); WP 1.38–1.50 (1.46 ± 0.05); MLF 3.05–3.15 (3.12 ± 0.04); MLT 2.15–2.24 (2.19 ± 0.04); MTL 0.87–0.95 (0.91 ± 0.03); MTW 0.64–0.78 (0.71 ± 0.05); OL 2.0–2.10 (2.07 ± 0.04).

Occurrence. Municipalities of Cariacica and Santa Teresa, Espírito Santo state, Brazil; municipality of Itamaraju, Bahia state, Brazil.

Material examined. Type: labeled as "Holotype, male, Brazil, ES, Cariacica, Reserva Biológica de Duas Bocas, 21.vi.2012, 20°16'19.05"S, 40°28'42.53"O, CNPq-Sisbiota, licença SISBIO n° 31324 (de Mello & equipe leg.)". Paratypes: five females and five males, labeled as "Brazil, ES, Cariacica, Reserva Biológica de Duas Bocas, 21.vi.2012, 20°16'19.05"S, 40°28'42.53"O, CNPq-Sisbiota, licença SISBIO n° 31324 (de Mello & equipe leg.)". Others: nine males and eight females, labeled as "Brazil, ES, Santa Teresa, Reserva Biológica Augusto Ruschi, 14-19.vii.2014, 19°54'23.81"S, 40°33'29.37"O, licença SISBIO n° 37717, (M. R. Pereira & D. S. M. Silva leg.)" and eight males and eight females, labeled as "Brazil, ES, Santa Teresa, Estação Biológica de Santa Lúcia, 14-19.vii.2014, 19°58'6.98"S, 40°32'22.56"O (M. R. Pereira & D. S. M. Silva leg.)"; two males and

two females, labeled as "Brazil, Bahia, Itamaraju, Parque Nacional do Monte Pascoal, 16.vii.2012, 16°53'17.33"S, 39°24'54.89"O, CNPq-Sisbiota, licença SISBIO n° 31324 (de Mello & equipe leg.)".

Discussion

This new genus presents morphological proximity of external characteristics and both male and female genitalia, with two other Neotropical genera of Nemobiinae: *Amanayara* and *Kevanemobius*. Regarding external morphology this proximity is characterized by the presence of modified spurs on the tibia of the third pair of legs (Fig. 3C, D) and ovipositor with distal portion of the dorsal valves serrated (Fig. 5G, I). In *Kevanemobius* (see Bolfarini *et al.* 2012; Fig. 4E) and in the new genus (Fig. 3D) however, the inner disto-dorsal spur of the tibia of the third pair of legs does not present evidence of a gland. In addition to this, the inner proximo-dorsal spur presents a modification in its size and shape, being considered reduced, but with different morphology than in *Amanayara* (see De Mello & Jacomini 1994; Fig. 1B) and *Kevanemobius* (see Bolfarini *et al.* 2012; Fig. 4E). Male genitalia in these three genera present the same pattern, with the median lobe of the pseudepiphallus being composed of two projections (ventral and apical), rami totally fused to the pseudepiphallus and the endophallus divided into three sclerites, being one central and two laterals.

Although the tegmina are reduced in the species of *Amanayara*, *Kevanemobius* and in this new genus, there are important differences, since in the species of *Amanayara*, the male tegmina are reduced and covered by the pronotum, and do not present veins. In *Kevanemobius* and in this new genus, the male tegmina present simplified veins, without the presence of a structure modified for the production of sound (for this new genus, see: Figs. 2A, D and 3A; for *Kevanemobius*, see: Bolfarini *et al.* 2012; Fig. 4A). In *Kevanemobius* however, the tegmina present lateral fields (see Bolfarini *et al.*, 2012; Fig. 4B), which is absent in the tegmina of this new genus (Fig. 2B, D). Eight genera of Nemobiinae with Nearctic and Neotropical distribution present developed tegmina: *Allonemobius* (Hebard 1913), *Argizala* (Walker 1869), *Eunemobius* (Hebard 1913), *Hygronemobius* (Hebard 1913), *Neonemobius* (Hebard 1913), *Pepoyara* (De Mello & Capellari 2012), *Pictonemobius* (Vickery & Johnstone 1970) and *Pteronemobius* (Jacobson 1904). The other three genera of Nemobiinae with Neotropical distribution are wingless: *Absonemobius* (Desutter-Grandcolas 1993), *Phoremia* (Desutter-Grandcolas 1993) and *Zucchiella* (De Mello 1990). Moreover, there is also one genus of Nemobiinae with Neotropical distribution, *Monopteropsis* (De Mello & Jacomini 1994), that presents tegmina, but the left one is regressed and remains covered by the pronotum, with only the right tegmen visible (De Mello & Jacomini 1994).

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Legends of illustrations

FIGURE 1. **A** – Sampling points in the Atlantic Forest (area highlighted in green) in the states of Bahia (BA) and Espírito Santo (ES), Brazil (empty circle – Estação Biológica de Santa Lúcia; letter "x" – Reserva Biológica Augusto Ruschi; black triangle – Parque Nacional do Monte Pascoal; rhombus - Reserva Biológica de Duas Bocas); **B** – Reserva Biológica Augusto Ruschi, Santa Tereza, ES, Brazil; **C** – Estação Biológica de Santa Lúcia, Santa Tereza, ES, Brazil; **D** – Parque Nacional do Monte Pascoal, Itamaraju, BA, Brazil; **E** – Reserva Biológica de Duas Bocas, Cariacica, ES, Brazil. The images B, C, D and E were obtained through Google Earth Pro software version 7.1.5.1557.

FIGURE 2. *Pepoapua cariacica* Jesus & Pereira **n. sp.**, male holotype (*habitus*). **A** – dorsal view; **B** – lateral view; **C** – ventral view; **D** – head and pronotum, lateral view.

FIGURE 3. *Pepoapua cariacica* Jesus & Pereira **n. sp.**, paratype (A–B) and male holotype (C–I). **A** – dorsal view of right tegmen; **B** – detail of right tegmen, dorsal view; **C** – dorsal spurs of hind tibia; **D** – detail of proximo-dorsal inner spur of tibia of the third pair of legs (non-specialized); **E** – ventro-apical inner and outer spurs of the tibia of the third pair of legs (arrows); **F** – outer apical spurs of the tibia of the third pair of legs: o.s: outer superior, o.m: outer median, o.v: outer ventral; **G** – apical inner spurs of the tibia of the third pair of legs: i.s: inner superior, i.m: inner median, i.v: inner ventral; **H** – supranal plate; **I** – subgenital plate.

FIGURE 4. *Pepoapua cariacica* Jesus & Pereira **n. sp.**, genitalia of male paratype. **A** – Photograph in ventral view; **B** – Photograph in dorsal view; **C** – Photograph in lateral view; **D** – Illustration in ventral view; **E** – Illustration in dorsal view; **F** – Illustration in lateral view **Abbreviations:** ps.a.l – pseudepiphallalic apical lobe; ps.m.l – pseudepiphallalic median lobe; ps.p – pseudepiphallalic parameres; ps.sc – pseudepiphallalic sclerite; ec.f – ectophallic fold; v.v – ventral valve; end.sc – endophallic sclerite; a.g – accessory gland.

FIGURE 5. *Pepoapua cariacica* Jesus & Pereira **n. sp.**, paratype female. **A** – habitus in dorsal view; **B** – habitus in lateral view; **C** – habitus ventral view; **D** – head and pronotum, in lateral view; **E** – supranal plate; **F** – subgenital plate; **G** – ovipositor, in lateral view; **H** – ovipositor, in ventral view; **I** – detail of distal portion of ovipositor.

