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Ruppeliana Young (Insecta: Hemiptera: Cicadellidae): three new species, redescriptions, and key to males

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Abstract. The Neotropical genus *Ruppeliana* Young, 1977 comprises 13 species. The following three are redescribed and illustrated herein: *R. coronata* (Signoret, 1853), *R. fulva* (Taschenberg, 1884), and *R. nigripes* (Signoret, 1853). Additionally, three new species are described and illustrated: *R. delicata* sp. nov., *R. robusta* sp. nov., and *R. tridentata* sp. nov., from the states of Paraná, Santa Catarina, and Rio de Janeiro, respectively. A revised diagnosis, a key to males, a distribution map, and a neotype designation for *R. grossii* Cavichioli *et al.*, 2017 are also proposed.

Keywords. Taxonomy, sharpshooter, Cicadellini, Neotropical Region.

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Introduction

Ruppeliana was established by Young (1977) to accommodate *Tettigonia signiceps* Stål, 1862, along with the following species: *Tettigonia coronata* Signoret, 1853; *T. coronulifera* Stål, 1862; *T. episcopalis* Signoret, 1853; *T. fulva* Taschenberg, 1884; *T. glaucomaculata* Germar, 1821; *T. nigripes* Signoret, 1853; and *T. taschenbergi* Berg, 1899. Additionally, Young described a new species, *R. tatia*. Recent studies have described six new species: *R. caelimaculata* and *R. flavivirescens* (Carvalho *et al*. 2014), as well as *R. barbarensis*, *R. grossii*, *R. longiphallus*, and *R. serrana* (Cavichioli *et al.* 2017). Furthermore, *R. coronulifera* and *R. taschenbergi* were synonymized with *R. signiceps* (Stål, 1862) (Carvalho *et al.* 2014). At the present moment, *Ruppeliana* comprises 13 species. Although the original genus description included records from southern Brazil and northern Argentina, the Argentinian record could not be confirmed in subsequent studies (Cavichioli *et al.* 2017).

Ruppeliana was placed near *Pawiloma* Young, 1977 due to similarities in both male and female genitalia (Young 1977). However, they differ in the former having elongated basal processes of the aedeagus (Carvalho *et al.* 2014). Representatives of *Ruppeliana* are colorful and robust, measuring approximately

10 millimeters, but they are not commonly found in collections (Cavichioli *et al.* 2017). This rarity likely explains why Young (1977) did not propose a dichotomous key for the genus.

The original descriptions of *R. coronata*, *R. episcopalis*, *R. fulva*, *R. glaucomaculata*, *R. nigripes*, and *R. signiceps* are brief and primarily focused on external morphology. Most of these species were later redescribed and illustrated by Young (1977), except for *R. nigripes* and *R. coronata*, for which the author suggested a possible synonymy. The illustrations of *R. coronata* were based on a non-type series male, while for *R. nigripes*, Young (1977) provided only a lateral view of the pygofer and a ventral view of the aedeagus.

Due to the absence of detailed morphological descriptions and illustrations in previous studies, we redescribed and illustrated the species *R. coronata*, *R. nigripes*, and *R. fulva*, describing the color variation for the latter. Additionally, we describe three new species: *R. delicata* sp. nov., *R. tridentata* sp. nov., and *R. robusta* sp. nov. We also provide a key to the males of the genus, an occurrence map and a neotype designation for *R. grossii*.

Material and methods

The terminology adopted here follows Young (1977) for the main terms, Hamilton (1981) and Mejdalani (1993, 1998) for facial areas of the head, and Nielson (1965) for female genitalia. The terms "gonoplac" and "sculpted areas of first ovipositor valvule" follow Mejdalani (1998). The techniques for genitalia preparation follow Cavichioli & Takiya (2012), with modifications as in Domahovski (2024). The dissected parts were stored in microvials with glycerin, as suggested by Young & Beirne (1958).

Digital images of habitus were obtained with a Leica MZ12.5 stereo microscope with a SCMOS 05000KPB digital camera attached and were stacked using CombineZP software. First and second valvulae and gonoplacs were separated and mounted on a temporary slide covered with a cover slip, then photographed using the former mentioned digital camera, attached to a Nikon optical microscope at 40× and 100× magnification.

The specimens examined are deposited in the Coleção Entomológica Padre Jesus Santiago Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil (DZUP), and in Museu Nacional do Rio de Janeiro (MNRJ).

The occurrence map was generated using Simple Mappr (available online at https://www.simplemappr.net/), with data obtained from the literature (Young 1977; McKamey 2007; Froza *et al.* 2024; and original descriptions), from the online source *Taxonomic Catalogue of Brazilian Fauna* (Takiya *et al.* 2024), and from specimen labels deposited at DZUP.

Results

Taxonomy

Class Insecta Linnaeus, 1758
Order Hemiptera Linnaeus, 1758
Suborder Auchenorrhyncha Duméril, 1806
Family Cicadellidae Latreille, 1825
Subfamily Cicadellinae Latreille, 1825
Tribe Cicadellini Latreille, 1825

Genus ***Ruppeliana*** Young, 1977

Type species

Tettigonia signiceps Stål, 1862.

Diagnosis

(1) Head moderately produced, with anterior margin broadly rounded; (2) interocular width greater than pronotum; (3) clypeus, in lateral view, inflated medially; (4) pronotum without sculpting; (5) male pygofer strongly produced posteriorly; (6) subgenital plate triangular and attaining to pygofer apical third, frequently with a row of microsetae along dorsal margin; (7) connective bearing a median keel; (8) aedeagus curved ventrally with a sheath-like atrium, with at least a pair of basidorsal processes; (9) paraphysis absent; (10) second valvulae of female bearing irregular shaped teeth in basal curvature.

Included species

(Distribution based on Young 1977; McKamey 2007; Carvalho *et al*. 2014; Cavichioli *et al.* 2017, Taxonomic Catalogue of Brazilian Fauna and material deposited at DZUP).

1 *R. barbarensis* Cavichioli, Carvalho & Mejdalani, 2017. Distribution: Brazil (Minas Gerais State).
2. *R. caelimaculata* Carvalho, Cavichioli, Rodrigues & Gonçalves, 2014. Distribution: Brazil (Espírito Santo State).
3. *R. coronata* (Signoret, 1853). Distribution: Brazil.
4. *R. delicata* sp. nov. Distribution: Brazil (Paraná State).
5. *R. episcopalis* (Signoret, 1853). Distribution: Brazil (Rio de Janeiro State).
6. *R. flavivirescens* Carvalho, Cavichioli, Rodrigues & Gonçalves, 2014. Distribution: Brazil (Minas Gerais State).
7. *R. fulva* (Taschenberg, 1884). Distribution: Brazil (Minas Gerais, Rio de Janeiro, São Paulo, Paraná, and Santa Catarina states).
8. *R. glaucomaculata* (Germar, 1821). Distribution: Brazil (Bahia and Minas Gerais states).
9. *R. grossii* Cavichioli, Carvalho & Mejdalani, 2017. Distribution: Brazil (Rio de Janeiro State).
10. *R. longiphallus* Cavichioli, Carvalho & Mejdalani, 2017. Distribution: Brazil (Rio de Janeiro State).
11. *R. nigripes* (Signoret, 1853). Distribution: Brazil (Minas Gerais, Rio de Janeiro, and São Paulo states).
12. *R. robusta* sp. nov. Distribution: Brazil (Paraná and Santa Catarina states).
13. *R. serrana* Cavichioli, Carvalho & Mejdalani, 2017. Distribution: Brazil (Rio de Janeiro State).
14. *R. signiceps* (Stål, 1862). Distribution: Brazil (Bahia [new record], Espírito Santo, Minas Gerais, Rio de Janeiro, and Paraná states).
15. *R. tatia* Young, 1977. Distribution: Brazil (Rio de Janeiro State).
16. *R. tridentata* sp. nov. Distribution: Brazil (Rio de Janeiro State).

Ruppeliana coronata (Signoret, 1853)
Figs 1–2

Tettigonia coronata Signoret, 1853: 348.

Ruppeliana coronata – Young 1977: 751. — Cavichioli *et al.* 2017: 438 (in key).

Diagnosis

Large sharpshooters, about 10 mm length (Fig. 1A–B). Overall body coloration yellow, with a horseshoe shaped macula in frons (Fig. 1A–C). Forewings reddish, with yellowish or whitish longitudinal straps (Fig. 1A–B). Male pygofer in dorsal view with apices directed inwards (Fig. 15A). Subgenital plate in lateral view attaining pygofer's apex (Fig. 1D). Style very long with microsetae in outer margin and apex rounded (Fig. 1F). Aedeagal atrium with a pair of long and slender basidorsal processes and a pair of acute short processes preapically (Fig. 1G–H).

Material examined

BRAZIL – **Minas Gerais State** • 2 ♂♂; Itamonte; elev. 2100–1700 m; 21–23 Nov. 2008; R. Carvalho, O. Evangelista and D. Takiya leg,; DZUP • 1 ♀; Extrema, Morro do Lopo; 22.881° S, 46.308° W; elev. 1520 m; 9 Dec. 2012; P. Grossi leg.; DZUP. – **Paraná State** • 1 ♂; Porto Mendes; Oct. 1998; S.B. Pessoa leg.; DZUP. – **Rio de Janeiro State** • 2 ♀♀; Itatiaia, Parque, Nacional do Itatiaia; 22.452500° S, 44.610681° W; elev. 788 m; 12–14 Jan. 2023; A.P. Pinto, A.C. Domahovski, J. Ehlert and L.P. Aguiar leg.; sweep; DZUP • 1 ♂; 1 ♀; same data as for preceding; 22.431° S, 44.625° W; elev. 1200 m; 30 Oct. 2011; R.R. Cavichioli leg.; DZUP • 1 ♂; same data as for preceding; elev. 2000 m; Jan. 1957; U. Barth leg.; DZUP • 1 ♀; same data as for preceding, Trilha Hotel Simon; 22.436° S, 44.609° W; elev. 1100 m; 28 Oct. 2011; R.R. Cavichioli leg.; DZUP • 1 ♂; Engenheiro Passos, BR-485, Km 11, Hotel Fazenda Palmital; 22°25′26″ S, 44°44′21″ W; elev. 960 m; 26 Apr. 2007; J.A. Rafael and F.F. Xavier leg.; light; DZUP. – **São Paulo State** • 2 ♀♀; Serra Cantareira, Horto Florestal; 8 Aug. 1946; F. Lane leg.; DZUP • 1 ♀; same data as for preceding; S. Lopes leg.; DZUP • 1 ♀; same data as for preceding; Apr. 1934; R. Spitz leg; DZUP • 1 ♂; same data as for preceding; Mar. 1935; L. Travassos leg.; DZUP • 1 ♂; same data as for preceding; 16 Oct. 1946; F. Lane leg.; DZUP • 1 ♂, 1 ♀; Campos do Jordão; Nov. 1957; K. Lenko leg.; DZUP.

Description

Measurements (mm). Total length. Males: 10.6–13.4 (n = 9), females: 10.8–13.5 (n = 10).

Head (Fig. 1A). In dorsal view, moderately produced anteriorly, anterior margin rounded, median length of crown approximately ⅓ of interocular width and ⅓ of transocular width. Frons (Fig. 1C), in frontal view, texture slightly granular, muscular impressions indistinct, epistomal suture complete. Clypeus (Fig. 1C), in frontal view, slightly pubescent apically. Pronotum (Fig. 1A), in dorsal view, with lateral margins slightly convergent anteriorly, posterior two-thirds of disk slightly transversely striated medially. Mesonotum (Fig. 1A) texture slightly granulated. Forewings (Fig. 1A–B) veins and membrane distinct, including inner apical cell and posterior third of remaining apical cells; bases of anteapical cells approximately aligned with claval apex. Remaining characteristics of external morphology as described for the genus by Young (1977: 747).

Coloration. Crown (Fig. 1A–B) yellow. Frons (Fig. 1C) yellow, with a brown horseshoe-shaped macula. Clypeus (Fig. 1C) yellow, with a longitudinal brown stripe medially, enlarging in apex. Lorum and gena (Fig. 1C) yellow. Pronotum (Fig. 1A) yellow, with a browned stripe medially and posterior margin brown. Mesonotum, meso and metasternum (Fig. 1B–C) yellow. Forewing (Fig. 1A–B) red, with

longitudinal yellow or whitish longitudinal stripes, membrane darkened. Legs (Fig. 1B–C) yellow with distal portions darkened. Abdomen (Fig. 2A–B) yellow, with lateral margins blackened.

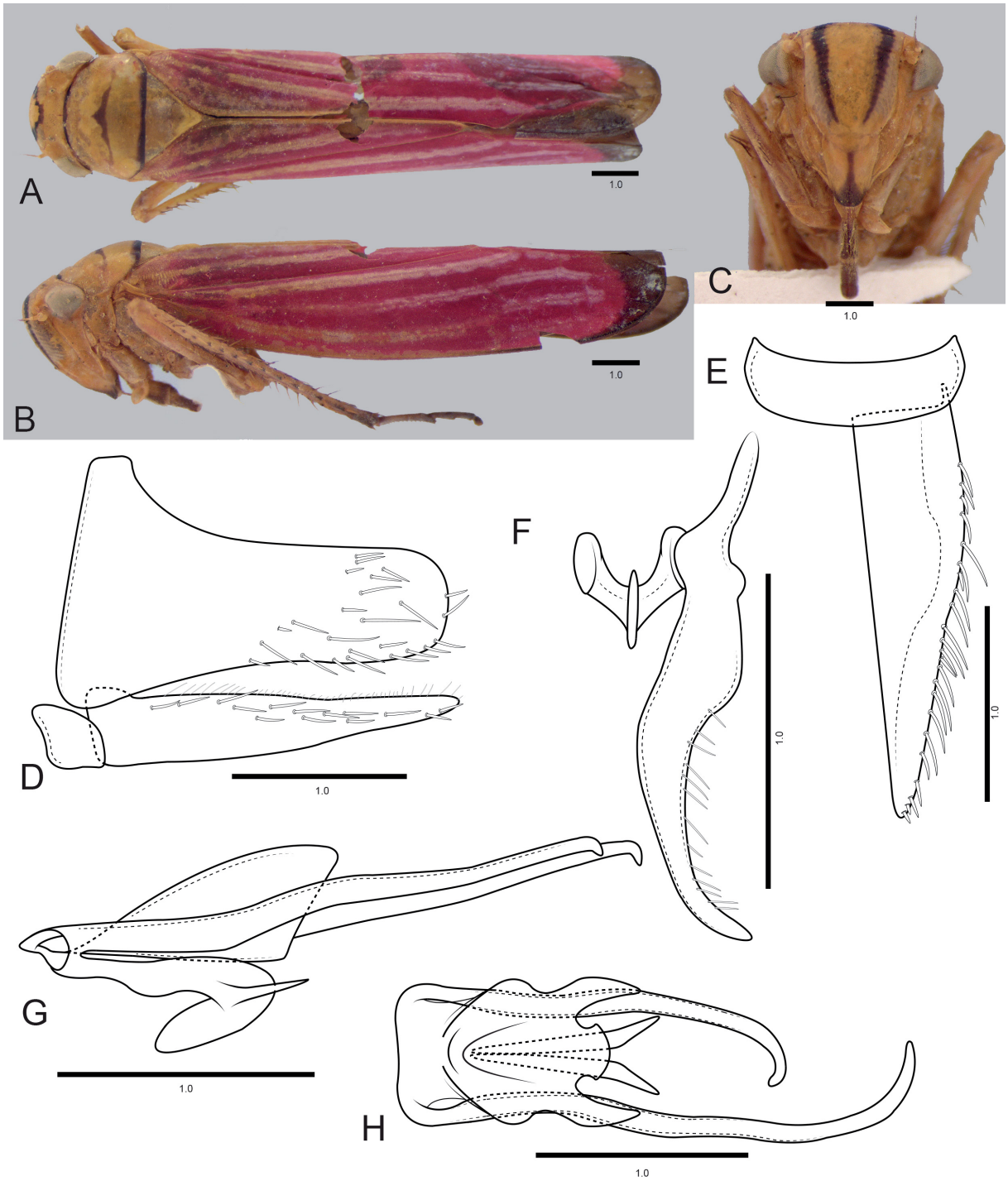

Fig. 1. *Ruppeliana coronata* (Signoret, 1853), ♂ (Brazil, Itatiaia, Parque, Nacional do Itatiaia; 30 Oct. 2011; R.R. Cavichioli leg; DZUP). **A**. Habitus, dorsal view. **B**. Habitus, lateral view. **C**. Head, frontal view. **D**. Pygofer, valve and subgenital plate, lateral view. **E**. Valve and subgenital plates, ventral view. **F**. Connective and style, ventral view. **G**. Aedeagus, lateral view. **H**. Aedeagus, ventral view. Scale bars in mm.

Male genitalia. Pygofer (Fig. 1D), in lateral view, strongly produced posteriorly, dorsal, and ventral margins narrowed after basal third, posterior margin broadly rounded, macrosetae distributed along the

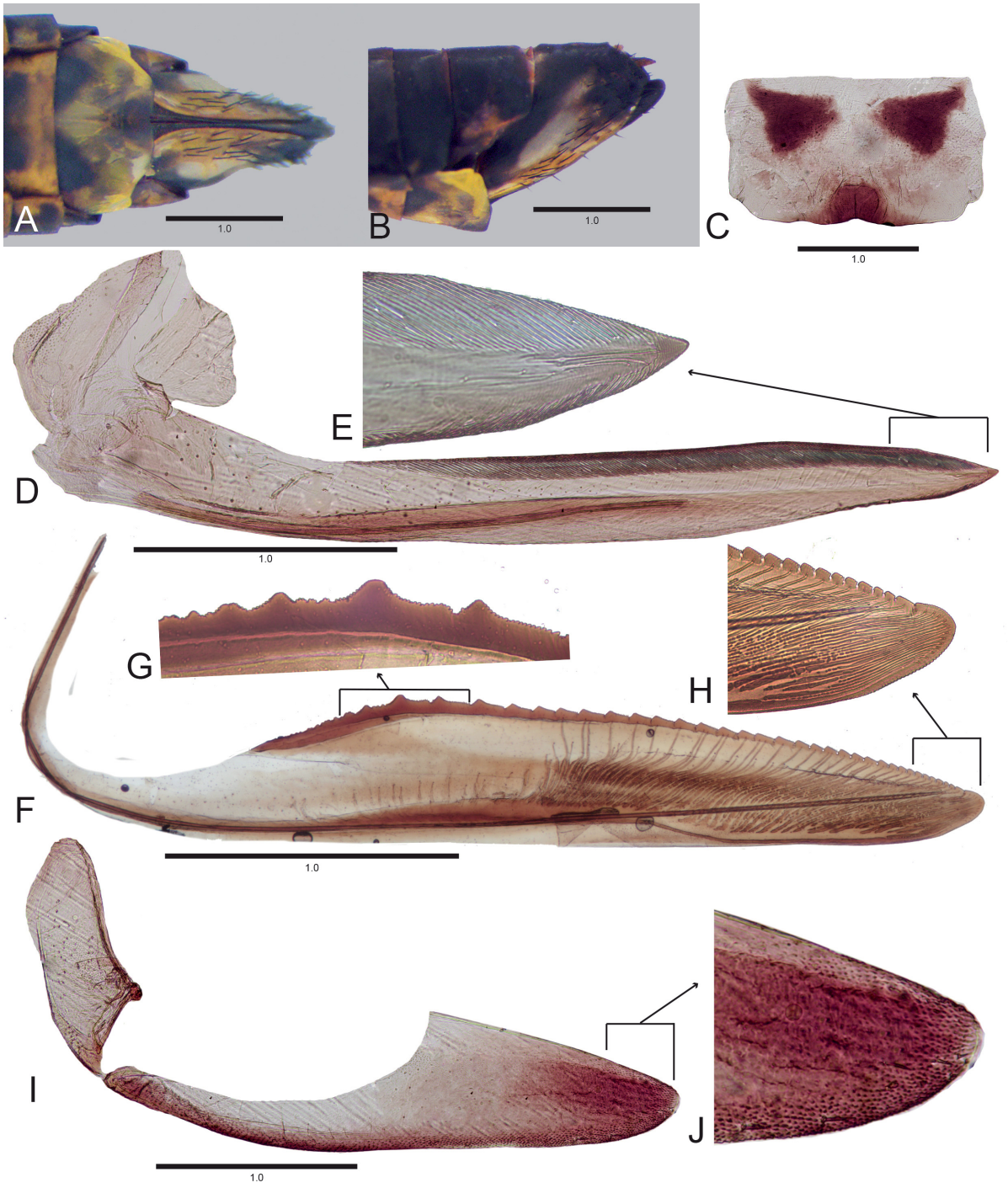

Fig. 2. *Ruppeliana coronata* (Signoret, 1853), ♀ (Brazil, Itatiaia, Parque, Nacional do Itatiaia; 12–14 Jan. 2023; A.P. Pinto, A.C. Domahovski, J. Ehlert and L.P. Aguiar leg; DZUP). **A**. Distal portion of abdomen, ventral view. **B**. Distal portion of abdomen, lateral view. **C**. Sternite VII, ventral view. **D**. First valvifer and first valvula, lateral view. **E**. Apical portion of first valvula. **F**. Second valvula, lateral view. **G**. Basal portion of second valvula. **H**. Apical portion of second valvula. **I**. Second valvifer and gonoplac, lateral view. **J**. Apical portion of gonoplac. Scale bars in mm.

posterior thirds of disc; in dorsal view, apex directed inwards. Valve (Fig. 1E), in ventral view, narrow, lateral margins acute apically, ventral margin slightly rounded. Subgenital plate (Fig. 1D–E), in ventral view, triangular, broadened at base, narrowing gradually towards apex, inner margin rectilinear, outer margin with a uniseriate row of macrosetae; in lateral view, slightly surpassing pygofer apex, dorsal margin with multiseriate row of long microsetae. Style (Fig. 1F), in dorsal view, very elongate, extending posteriorly much beyond apex of connective, apical portion curved outwards, outer margin bearing microsetae, apex rounded. Connective (Fig. 1F), in dorsal view, V-shaped, arms, and stalk short, with a median keel. Aedeagus (Fig. 1G–H), in lateral view, shaft broadened apically, dorsal margin slightly curved, apex truncated; in dorsal view, apex opened medially as the gonopore exit. Aedeagal atrium well developed, forming a sheath-like structure with apical portion curved anteriorly, reaching shaft's apex, with two pairs of acute processes, one elongate basidorsal, with an acute and curved ventrally apex, trespassing much far as shaft's apex; second short and acute, located preapically; in ventral view, preapical short processes subparallel, and basidorsal processes apical portions convergent.

Female genitalia. Pygofer (Fig. 2B), in lateral view moderately produced posteriorly, posterior margin triangular, macrosetae along ventral and posterior margins. Abdominal sternite VII (Fig. 2A–C) wider than long, posterior margin slightly emarginated medially; posterolateral corners slightly directed outwards. Valvifer I (Fig. 2D), in lateral view, rounded. Valvula I (Fig. 2D–E), in lateral view, blade narrowed apically, apex acute; dorsal sculptured area strigate, extending from basal portion to apex, ventral sculpted area strigate, restricted to apical portions. Valvula II (Fig. 2F–H), in lateral view, slightly expanded beyond basal curvature, narrowing gradually towards apex; without preapical prominence; apex rounded; dorsal margin with 40 continuous teeth, irregular shaped after basal curvature, robust and subtriangular at basal and median portions and small and trapezoid in apical portion, all bearing denticles. Gonoplac (Fig. 2I–J), in lateral view, with basal half narrow, bearing denticuli in ventral margin, apical half expanded; apex rounded, with apical surface bearing denticuli and few macrosetae in ventroposterior margin.

Remarks

Ruppeliana coronata and *R. nigripes* were suggested by Young (1977) to be possible synonyms. However, they can be distinguished by several morphological characteristics. The forewing coloration is reddish at *R. coronata* and brown in *R. nigripes*. In dorsal view, the pygofer apices are directed inwards in *R. coronata* (Fig. 15A), whereas they are subparallel in *R. nigripes* (Fig. 15B). Additionally, the subgenital plate reaches or surpasses pygofer apex in *R. coronata*, while in *R. nigripes*, it does not extend beyond pygofer apical portion.

Ruppeliana fulva (Taschenberg, 1884)
Figs 3–5

Tettigonia fulva Taschenberg, 1884: 442.

Ruppeliana fulva – Young 1977: 751. — Cavichioli *et al.* 2017: 438 (in key).

Diagnosis

Sharpshooters with about 8 mm (Figs 3A–B, 4A–D). Overall coloration yellow or green (Figs 3A–B, 4). Pronotum and forewings varying from pale (Fig. 4C–D) to dark green (Fig. 4A–B), mottled with small spots, which can be yellow (Fig. 4C–D), green (Fig. 4A–B) or dark green, always contrasting with forewings. Pygofer narrowed in apical portion, with posterior margin rounded (Fig. 3D). Subgenital plate attaining to pygofers apex (Fig. 3D). Style short, with apex acute (Fig. 3F). Aedeagal shaft curved ventrally, with apex rounded, basidorsal process long and subparallel (Fig. 3G). Aedeagal atrium forming a sheath-like structure, which is connected by membrane to aedeagal basis (Fig. 3G).

Material examined

BRAZIL – **Minas Gerais State** • 2 ♀♀; Itamonte; 10–14 Oct. 1998; D.M. Takiya leg.; DZUP • 1 ♀; Itamonte; elev. 2100–1700 m; 21–23 Nov. 2008; R. Carvalho, O. Evangelista and D. Takiya leg.; DZUP • 1 ♀; Parque Nacional do Caparaó; 20.40956° S, 41.84904° W; elev. 1517 m; 3–7 Mar. 2017; M. Savaris and A.L. Norrbom leg.; DZUP • 1 ♂; Extrema, Morro do Lopo; 22.881° S, 46.308° W; elev. 1520 m; 9 Dec. 2012; P. Grossi leg.; DZUP. – **Paraná State** • 1 ♂; BR 277, Km 54, Torre Telepar; 5–11 Dec. 1984; DZUP • 1 ♀; São José dos Pinhais; Feb. 1982; Cavichioli leg; DZUP • 1 ♀; same data as for preceding; 18 Jan. 1982; DZUP • 1 ♀; same data as for preceding; 25°36′05″ S, 49°36′05″ W; elev. 880 m; 21 Sep. 2011; A.C. Domahovski leg.; DZUP • 1 ♀; same data as for preceding; 25°36′18″ S, 49°11′37″ W; 6 Jun. 2015; A.C. Domahovski leg.; sweep; DZUP • 6 ♂♂; same data as for preceding; 18 Nov. 2015; DZUP • 1 ♂; same data as for preceding; 17–31 Dec. 2016; DZUP • 1 ♂; same data as for preceding; 19 Mar. 2016; DZUP • 2 ♂♂; same data as for preceding; 13 Aug. 2016; DZUP • 1 ♀; same data as for preceding; 1–31 Mar. 2018; Malaise trap; DZUP • 2 ♂♂; same data as for preceding; 1–31 Oct. 2019; DZUP • 1 ♂; same data as for preceding; 1–28 Feb. 2019; DZUP • 1 ♀; same data as for preceding; 19 Oct. 2020; sweep; DZUP • 1 ♂; same data as for preceding; 1–31 Mar. 2021; Malaise trap; DZUP • 1 ♂; Piraquara, Mananciais da Serra; 25°29′ S, 48°59′ W; elev. 980 m; 11–12 Dec. 2010; P.C. Grossi leg; DZUP • 1 ♂; same data as for preceding; elev. 1100 m; Jul. 2011; DZUP • 1 ♂, 1 ♀; same data as for preceding; 25.4966° S, 48.9839° W; elev. 1010 m; 1–16 Feb. 2019; G. Melo and A. Martins leg.; Malaise trap; DZUP • 1 ♀; same data as for preceding; 29–30 Nov. 2019; A.C. Domahovski and R.R. Cavichioli leg.; sweep; DZUP • 4 ♀♀; same data as for preceding; 25°29′47″ S, 48°58′54″ W; elev. 1021 m; 27–28 Feb. 2022; A.C Domahovski leg.; sweep; DZUP • 1 ♀; Piraquara, Parque Estadual do Marumbi; 25°29′13″ S, 48°58′30″ W; 24 Jan. 2012; Grossi, Cavichioli and Silva leg.; light trap; DZUP • 1 ♂; Colombo; Nov. 2012; M. Savaris and S. Lampert leg.; DZUP • 1 ♀; same data as for preceding; 1–31 Sep. 2014; Malaise trap; DZUP • 1 ♂; Curitiba; Sep. 1983; Costa and Eli leg.; DZUP • 1 ♀; Tijucas do Sul, Br376km; 25.835° S, 49.048° W; elev. 655–879 m; 7 Oct. 2011; M.L. Monné and R.R. Cavichioli leg.; DZUP • 1 ♂; same data as for preceding, Associação dos Professores UFPR; elev. 878 m; 25°50′14″ S, 49°02′57″ W; A. Paladini and R.R. Cavichioli leg; light trap; DZUP. – **Santa Catarina State** • 1 ♂; Rio Vermelho, São Bento do Sul; 16 Mar. 1974; elev. 850 m; Rank leg.; DZUP. – **São Paulo State** • 2 ♀♀; São José do Barreiro, Serra Bocaina; elev. 1600 m; Nov. 1976; F.M. Oliveira leg.; DZUP • 1 ♂; Campos do Jordão; Nov. 1957; K. Lenko leg; DZUP.

Description

Measurements (mm). Total length. Males: 8.1–8.5 (n = 24), females: 8.9–9.4 (n = 21).

Head (Fig. 3A). In dorsal view, moderately produced anteriorly, anterior margin from rounded to slightly subtriangular, median length of crown 1/5 of interocular width and approximately 1/4 of transocular width. Frons (Fig. 3C), in frontal view, texture slightly granular, muscular impressions distinct, epistomal suture obsolete medially. Clypeus (Fig. 3C), in frontal view, slightly pubescent apically. Pronotum (Fig. 3A), in dorsal view, with lateral margins convergent, posterior two-thirds of disk slightly transversely striated medially. Mesonotum (Fig. 3A) slightly granulated before transverse sulcus and slightly transversely striate posteriorly. Forewings (Fig. 3A–B) with veins indistinct, membrane distinct, including inner apical cell and posterior third of remaining apical cells; bases of anteapical cells approximately aligned with claval apex. Remaining characteristics of external morphology as described for the genus by Young (1977: 747).

Coloration. Crown and frons (Figs 3A–C, 4A–D) from pale to dark yellow, with various small blackened spots. Frons (Fig. 3C) with lateral and posterior margins smoky brown, clypeus yellow, with a longitudinal smoky brown stripe medially, and paler areas laterally. Lorum and gena (Fig. 3C) yellow. Pronotum (Figs 3A, 4A–C) anterior third blackened, with yellowed maculae, posterior two-thirds green with yellowed smoky rounded maculae. Mesonotum (Figs 3A, 4A–C) yellow, with browned maculae.

Meso and metasternum (Figs 3B, 4B–D) yellow. Forewing (Figs 3A–B, 4) from pale to dark green, mottled with small rounded yellowish or greenish maculae. Legs (Fig. 3C) yellow with orangish areas. Abdomen (Figs 4B, 5A–B) yellow, with reddish parts.

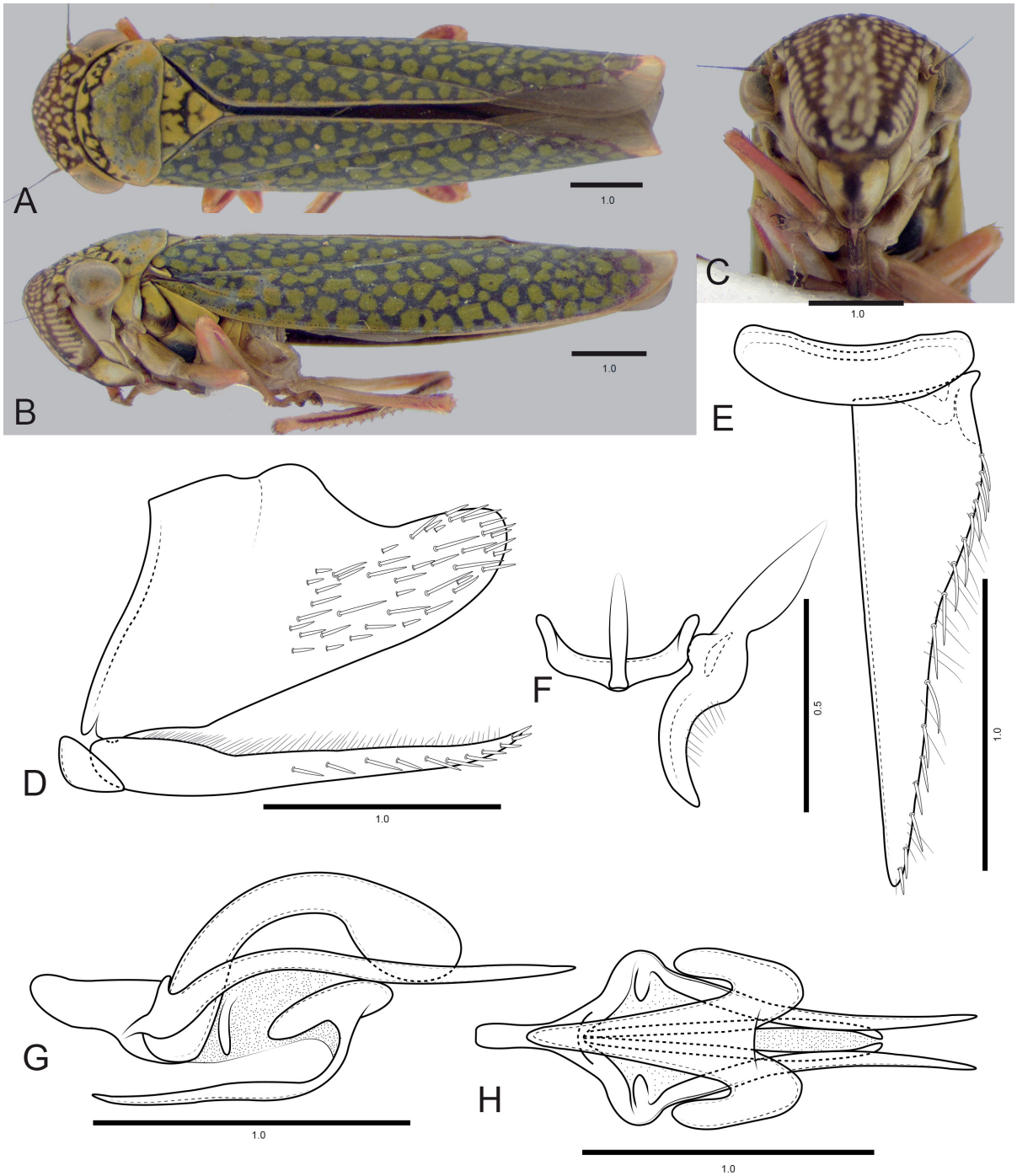

Fig. 3. *Ruppeliana fulva* (Taschenberg, 1884), ♂ (Brazil, São José dos Pinhais, 18 Nov. 2015; A.C. Domahovski leg.; DZUP). **A**. Habitus, dorsal view. **B**. Habitus, lateral view. **C**. Head, frontal view. **D**. Pygofer, valve and subgenital plate, lateral view. **E**. Valve and subgenital plates, ventral view. **F**. Connective and style, ventral view. **G**. Aedeagus, lateral view. **H**. Aedeagus, ventral view. Scale bars in mm.

Male genitalia. Pygofer (Fig. 3D), in lateral view, strongly produced posteriorly, dorsal margin elevated medially and narrowed preapically, posterior margin rounded, macrosetae distributed along the posterior two-thirds of disc. Valve (Fig. 3E), in ventral view, with a longitudinal thickening in anterior margin, lateral margins rounded. Subgenital plate (Fig. 3D–E), in ventral view, subtriangular, broaded at base, narrowing gradually towards apex, inner margin rectilinear, outer margin with a uniseriate row of macrosetae; in lateral view, reaching pygofer apex, dorsal margin with multiseriate rows of long microsetae. Style (Fig. 3F), in dorsal view, elongate, extending posteriorly beyond apex of connective, outer margin with a slight median lobe, apical portion curved outwards with outer margin bearing microsetae, apex acute. Connective (Fig. 3F), in dorsal view, U-shaped, arms short, with a median keel. Aedeagus (Fig. 3G–H), in lateral view, shaft conspicuously curved ventrally, with a slightly expanded rounded apex; in dorsal view, apex opened medially as the gonopore exit; aedeagal atrium well developed, forming a sheath-like structure directed anteriorly, almost reaching shaft's apex, with apical portion connected to basal portion by membrane, with a pair of elongate basidorsal processes, with acute apex, directed posteriorly and trespassing shaft's apex; in ventral view, anterior margin narrowly projected anteriorly, posterior margin of atrium with a strong reentrance medially, forming two distinct rounded lobes laterally; basidorsal processes apical portions parallel.

Female genitalia. Pygofer (Fig. 5B), in lateral view, moderately produced posteriorly, posterior margin triangular, macrosetae along ventral and posterior margins. Abdominal sternite VII (Fig. 5A–C) longer than wide, posterior margin slightly tipped medially, posterolateral corners slightly rounded. Valvifer I (Fig. 5D), in lateral view, rounded. Valvula I (Fig. 5D–E), in lateral view, blade narrowed apically, apex narrowly rounded, dorsal sculptured area strigate, extending from basal portion to apex, ventral sculpted area strigate, restricted to apical portions. Valvula II (Fig. 5F–H), in lateral view, expanded beyond basal curvature, narrowing slightly towards apex, without preapical prominence, apex rounded; dorsal margin with 55 continuous teeth, irregularly shaped after basal curvature, robust and subtriangular at basal and median portions and small and rounded in apical portion, all bearing denticles. Gonoplac (Fig. 5I–J), in lateral view, with basal half narrow, bearing denticuli in ventral margin, apical half expanded; apex rounded, with apical surface bearing denticuli and few macrosetae in posterior margin.

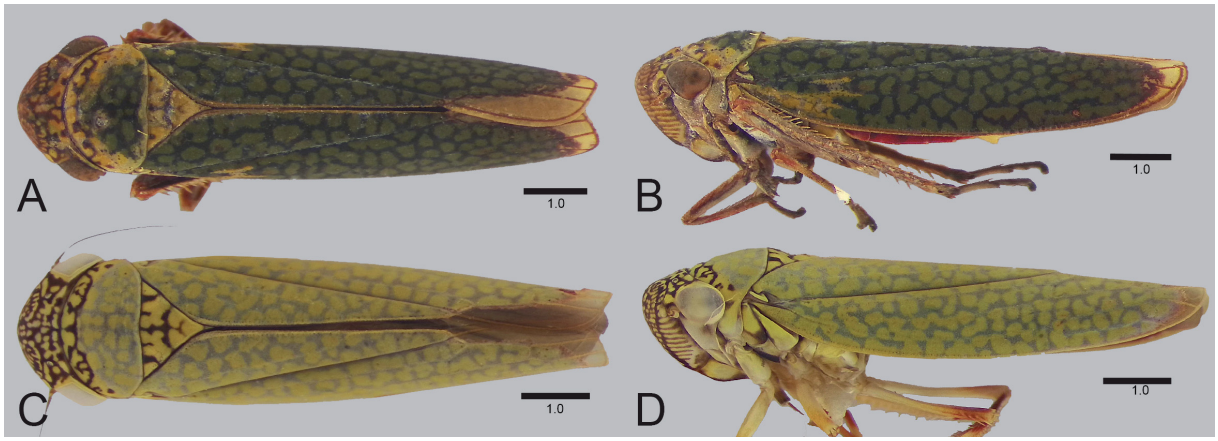

Fig. 4. *Ruppeliana fulva* (Taschenberg, 1884), color variation. **A–B**. Female from São José dos Pinhais (Brazil, São José dos Pinhais, 21 Sep. 2011; A.C. Domahovski leg.; DZUP). **A**. Habitus, dorsal view. **B**. Habitus, lateral view. **C–D**. Male from São José dos Pinhais (Brazil, São José dos Pinhais, 1–31 Mar. 2021; A.C. Domahovski leg.; DZUP). **C**. Habitus, dorsal view. **D**. Habitus, lateral view. Scale bars in mm.

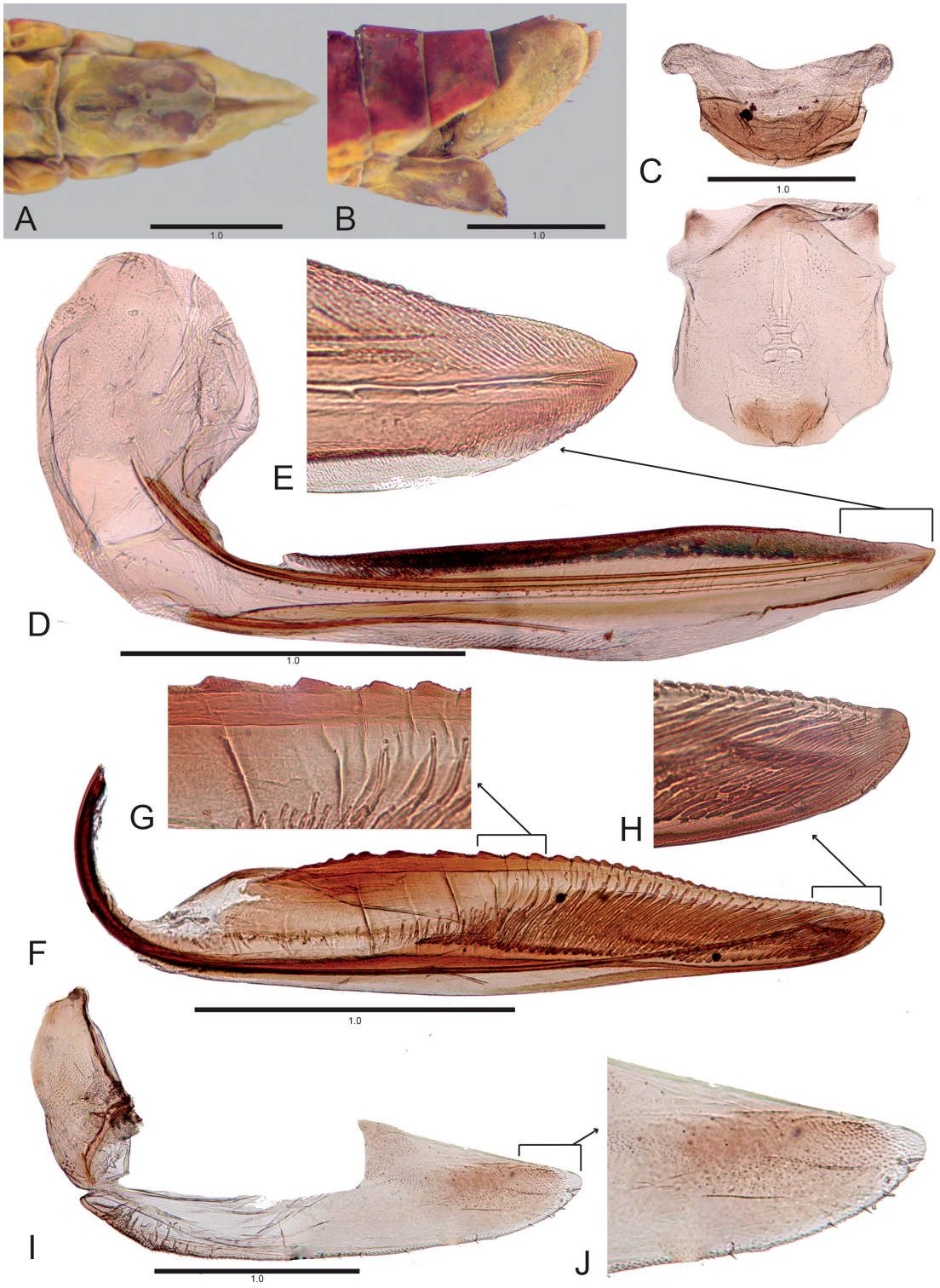

Fig. 5. *Ruppeliana fulva* (Taschenberg, 1884), ♀ (Brazil, São José dos Pinhais, 21 Sep. 2011; A.C. Domahovski leg; DZUP). **A**. Distal portion of abdomen, ventral view. **B**. Distal portion of abdomen, lateral view. **C**. Sternite VII, ventral view. **D**. First valvifer and first valvula, lateral view. **E**. Apical portion of first valvula. **F**. Second valvula, lateral view. **G**. Basal portion of second valvula. **H**. Apical portion of second valvula. **I**. Second valvifer and gonoplac, lateral view. **J**. Apical portion of gonoplac. Scale bars in mm.

Remarks

Ruppeliana fulva and *R. tridentata* sp. nov. both have mottled forewings with spots, but they can be readily distinguished by several characteristics. In *R. fulva*, the subgenital plate reaches the apex of the pygofer (Fig. 3D), whereas in *R. tridentata*, it does not (Fig. 12D). Additionally, *R. fulva* has a mottled crown and frons (Fig. 3C), while *R. tridentata* displays three longitudinal black bands (Fig. 12C). The aedeagal shape in *R. fulva* is similar to that of *R. delicata* sp. nov. and *R. robusta* sp. nov., with the shaft curving ventrally. However, *R. fulva* differs from these species in several aspects: it is considerably smaller in size, has a distinct forewing spot pattern, possesses a subgenital plate that reaches the pygofer apex, and has a female abdominal sternite VII that is longer than wide. Based on the available material, *R. fulva* is the most commonly collected species of *Ruppeliana*.

Ruppeliana nigripes (Signoret, 1853)
Figs 6–7

Tettigonia nigripes Signoret, 1853: 370.

Ruppeliana nigripes – Young 1977: 751. — Cavichioli *et al.* 2017: 438 (in key).

Diagnosis

Large and robust sharpshooters, about 12 mm in length (Fig. 6A–B). Overall coloration yellow, forewings brown, with longitudinal yellowish or whitish stripes (Fig. 6A–B). Male pygofer with apex narrowly rounded (Fig. 6D). Subgenital plate not attaining pygofer apex (Fig. 6D). Style long, with apical portion directed outwards and apex rounded (Fig. 6F). Aedeagus shaft expanded preapically, with apex truncated (Fig. 6G). Aedeagal atrium with two pairs of processes: one basidorsal, slender, long, and subparallel, the second preapical, short, and acute (Fig. 6G–H).

Material examined

BRAZIL – **São Paulo State** • 4 ♀♀; São José do Barreiro, Parque Nacional da Bocaina; elev. 1300–1600 m; 16–21 Dec. 2010; R.A. Carvalho leg.; DZUP • 1 ♂; same data as for preceding; 22°41′43″ S, 44°38′00″ W; elev. 1600 m; 1 Apr. 2010; G. Melo leg.; DZUP • 1 ♀; same data as for preceding; M.A. Vulcano leg; DZUP • 2 ♂♂, 2 ♀♀; same data as for preceding; Nov. 1976; F.M. Oliveira leg.; DZUP • 1 ♂; same data as for preceding; Mar. 1973; F.M. Oliveira leg.; DZUP • 1 ♀; same data as for preceding; R. Spitz leg.; DZUP.

Description

Measurements (mm). Total length. Males: 11.4–12.1 (n = 4), females: 12.1–13.1 (n = 8).

Head (Fig. 6A). In dorsal view, moderately produced anteriorly, anterior margin broadly rounded, median length of crown ¼ of interocular width and ⅓ of transocular width. Frons (Fig. 6C), in frontal view, texture slightly granular, muscular impressions indistinct, epistomal suture complete. Clypeus (Fig. 6C), in frontal view, slightly pubescent apically. Pronotum (Fig. 6A), in dorsal view, with lateral margins slightly convergent anteriorly; posterior two-thirds of disk slightly transversely striated medially. Mesonotum (Fig. 6A) texture slightly granulated. Forewings (Fig. 6A–B) veins indistinct; membrane distinct, including inner anteapical cell and posterior third of remaining apical cells; bases of anteapical cells approximately aligned with claval apex. Remaining characteristics of external morphology as described for the genus by Young (1977: 747).

Coloration. Crown (Fig. 6A–B) yellow. Frons (Fig. 6C) yellow, with a subquadrangular shaped black macula. Clypeus (Fig. 6C) yellow, with a longitudinal brown stripe medially, broadened basally and apically. Lorum and gena (Fig. 6C) yellow. Pronotum (Fig. 6A) yellow, with blackened anterior margin,

enlarged medially, a brown longitudinal stripe medially, posterior margin smoky black. Mesonotum (Fig. 6A) yellow, transverse sulcus darkened. Meso and metasternum (Fig. 6B–C) yellow. Forewing (Fig. 6A–B) brown, with three pairs of longitudinal yellow bands, one in clavus, one medially, and one

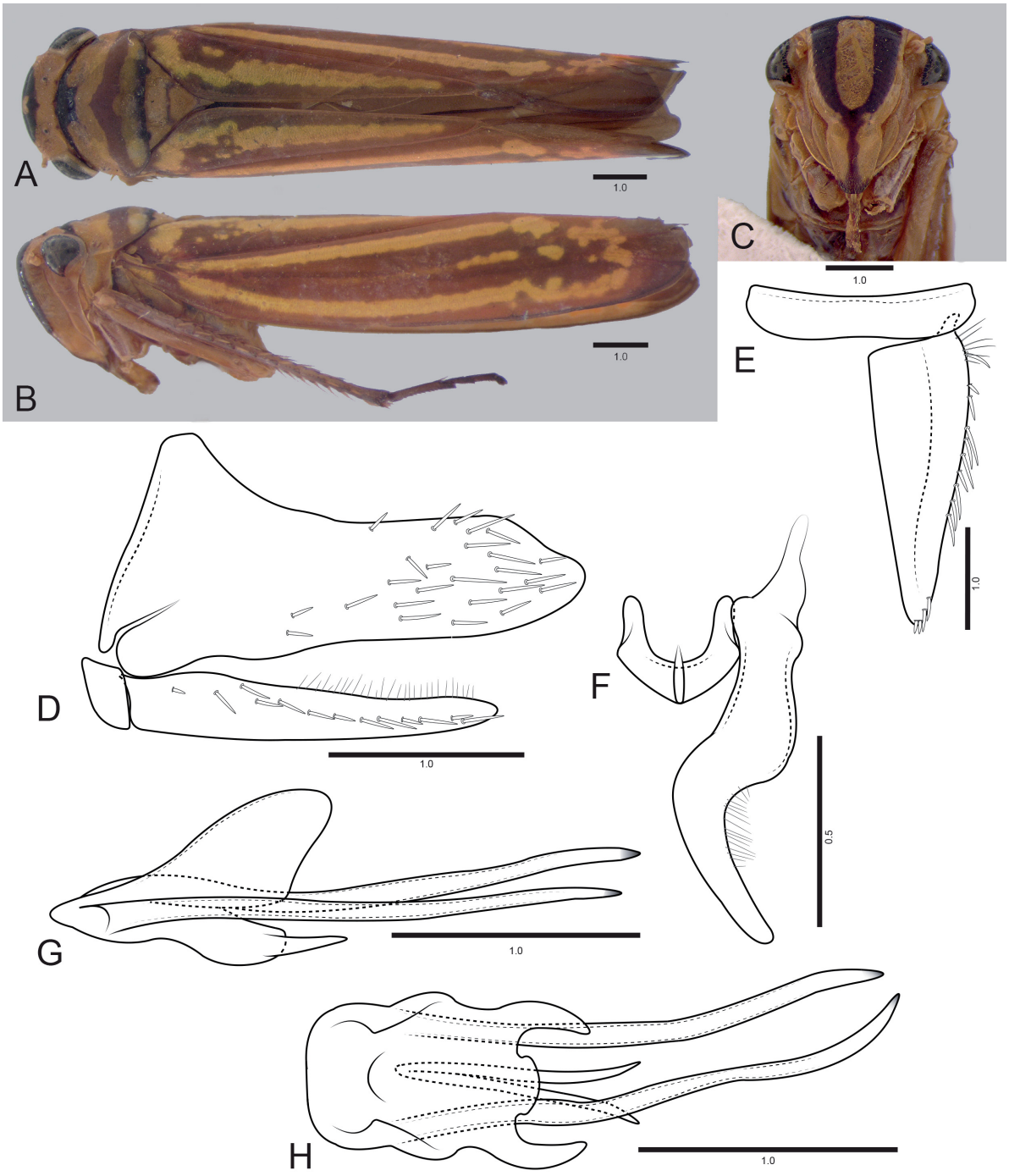

Fig. 6. *Ruppeliana nigripes* (Signoret, 1853), ♂ (Brazil, São José do Barreiro, Parque Nacional da Bocaina; 1 Apr. 2010; G. Melo leg.; DZUP). **A**. Habitus, dorsal view. **B**. Habitus, lateral view. **C**. Head, frontal view. **D**. Pygofer, valve and subgenital plate, lateral view. **E**. Valve and subgenital plates, ventral view. **F**. Connective and style, ventral view. **G**. Aedeagus, lateral view. **H**. Aedeagus, ventral view. Scale bars in mm.

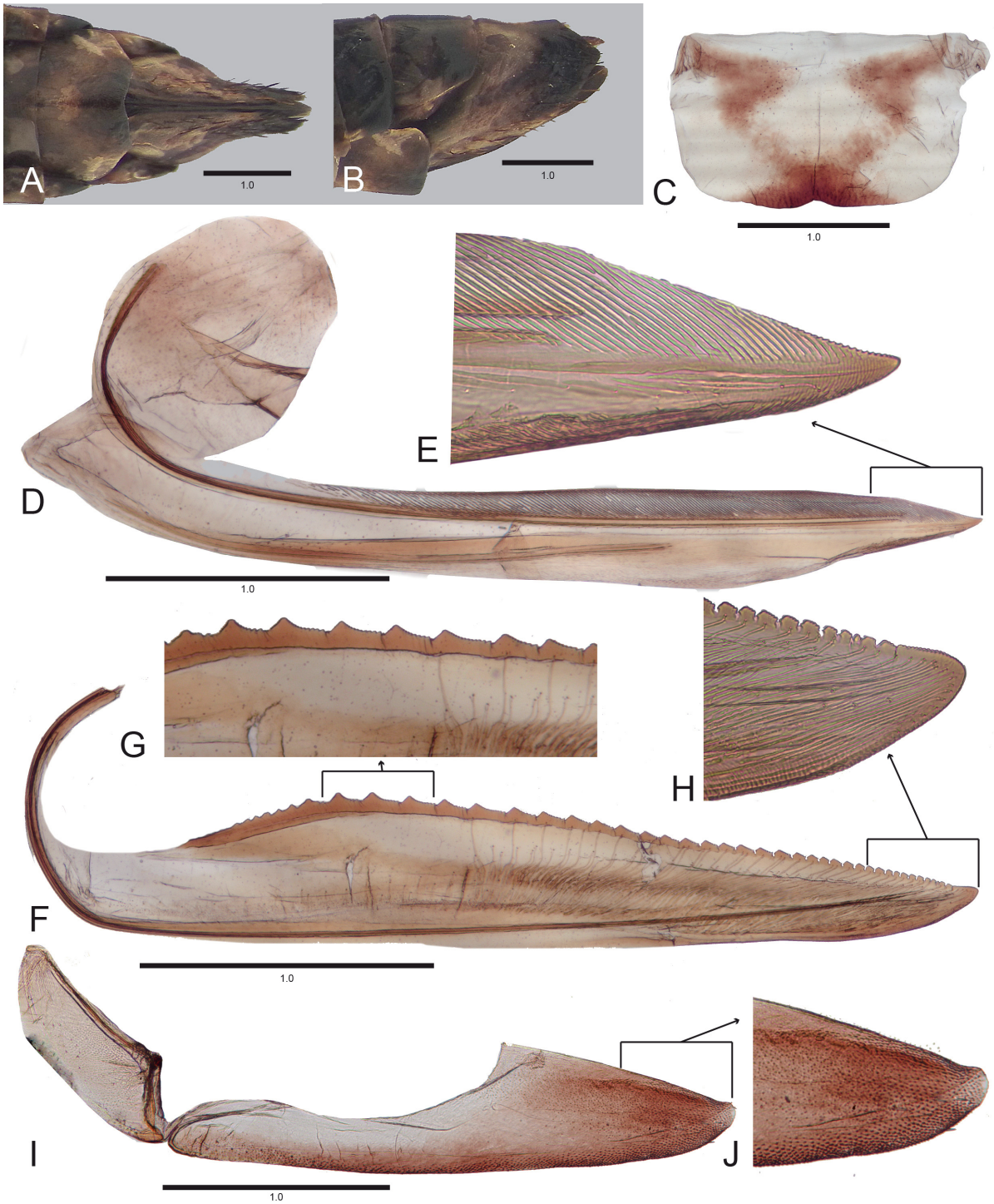

Fig. 7. *Ruppeliana nigripes* (Signoret, 1853), ♀ (Brazil, São José do Barreiro, Parque Nacional da Bocaina; Dec. 2010; R.A. Carvalho leg.; DZUP). **A**. Distal portion of abdomen, ventral view. **B**. Distal portion of abdomen, lateral view. **C**. Sternite VII, ventral view. **D**. First valvifer and first valvula, lateral view. **E**. Apical portion of first valvula. **F**. Second valvula, lateral view. **G**. Basal portion of second valvula. **H**. Apical portion of second valvula. **I**. Second valvifer and gonoplac, lateral view. **J**. Apical portion of gonoplac. Scale bars in mm.

in costal margin, the latter two almost connecting each other transversally. Legs (Fig. 6B) yellow with tibia and distal portions darkened. Abdomen (Fig. 7A–B) brown, with lateral margins paler.

Male genitalia. Pygofer (Fig. 6D), in lateral view, strongly produced posteriorly, dorsal, and ventral margins narrowing after basal third, posterior margin narrowly rounded, macrosetae distributed along the posterior third of disc; in dorsal view, with a pair of internal processes arising from anteroventral margin, parallel to each other and with rounded apex. Valve (Fig. 6E), in ventral view, narrow, dorsal, and ventral margins subparallel. Subgenital plate (Fig. 6D–E), in ventral view, triangular, narrowing gradually towards apex, inner margin rectilinear, outer margin with a uniseriate row of macrosetae; in lateral view, attaining pygofer posterior third, dorsal margin with multiseriate row of long microsetae. Style (Fig. 6F), in dorsal view, elongate, extending posteriorly much beyond apex of connective, apical portion curved outwards, outer margin bearing microsetae preapically, apex rounded. Connective (Fig. 6F), in dorsal view, U-shaped, arms short, with a short median keel. Aedeagus (Fig. 6G–H), in lateral view, shaft broadened apically, dorsal margin slightly curved ventrally, apex truncated; in dorsal view, apex opened medially as the gonopore exit. Aedeagal atrium well developed, forming a sheath-like structure, with two pairs of acute processes, one basidorsal, elongate with apex acute, trespassing much far as shaft's apex; second short and acute, located preapically; in ventral view, posterior margin tipped medially, short processes arising laterally, directed inwards; basidorsal processes apical portions convergent.

Female genitalia. Pygofer (Fig. 7B), in lateral view moderately produced posteriorly, posterior margin triangular, macrosetae along ventral and posterior margins. Abdominal sternite VII (Fig. 7B–C) wider than long, posterior margin slightly emarginated medially; posterolateral corners slightly rounded. Valvifer I (Fig. 7D), in lateral view, rounded. Valvula I (Fig. 7D–E), in lateral view, blade narrowed apically, base with a lobated projection directed anteriorly, apex acute; dorsal sculptured area strigate, extending from basal portion to apex, ventral sculpted area strigate, restricted to apical portions. Valvula II (Fig. 7F–H), in lateral view, expanded beyond basal curvature, narrowing gradually towards apex, without preapical prominence, apex rounded; dorsal margin with 40 continuous teeth, irregularly shaped after basal curvature, robust and triangular at basal and median portions and small and trapezoid in apical portion, all bearing denticles. Gonoplac (Fig. 7I–J), in lateral view, with basal half narrow, bearing denticuli in ventral margin, apical half expanded; apex rounded and slightly directed dorsally, with apical surface bearing denticuli and few macrosetae in ventroposterior margin.

Remarks

Ruppeliana nigripes can be distinguished from its congeners by its large, robust appearance and unique coloration, characterized by brown forewings with three pairs of conspicuous yellow longitudinal bands.

Ruppeliana delicata sp. nov.
urn:lsid:zoobank.org:act:9504029E-22B4-4691-AB1B-820EC4936A7C
Figs 8–9

Diagnosis

Large sharpshooters, about 10 mm length (Fig. 8A–B). Crown, frons and pronotum black, mottled with yellow spots (Fig. 8A–C). Forewing brown, with a longitudinal laterally yellow strap, from basal to anteapical portion, the remainder parts mottled with yellow spots (Fig. 8A–B). Male pygofer concave in dorsal margin posterior half (Fig. 8D). Subgenital plates not attaining pygofer apex (Fig. 8D). Style short with apex truncated (Fig. 8E). Aedeagal shaft curved ventrally, apex rounded (Fig. 8G). Aedeagal atrium sheath-like, apex directed anteriorly, with a pair of slender basidorsal processes, subparallel, with apex acute (Fig. 8G–H).

Etymology

The epithet '*delicata*' is derived from the Latin and means 'charming', 'elegant', and 'delicate', referring to the remarkable pattern and coloration of its representatives.

Type material

Holotype

BRAZIL – **Santa Catarina State** • ♂; Urubici, Parque Nacional São Joaquim; elev. 1600 m; 17–18 Mar. 2012; Grossi, Parizotto and Leivas leg.; DZUP.

Paratypes

BRAZIL – **Santa Catarina State** • 1 ♂, 8 ♀♀; same data as for holotype; DZUP.

Description

Measurements (mm). Total length. Male holotype: 9.6. Paratype (♂): 9.9 (n = 1); (♀) 9.9–11.2 (n = 8).

Head (Fig. 8A). In dorsal view, moderately produced anteriorly, anterior margin broadly rounded, median length of crown approximately ⅓ of interocular width and approximately ½ of transocular width. Frons (Fig. 8C), in frontal view, texture slightly granular, muscular impressions indistinct, epistomal suture obsolete medially. Clypeus (Fig. 8C), in frontal view, posterior half slightly pubescent. Pronotum (Fig. 8A), in dorsal view, with lateral margins slightly convergent apically; posterior two-thirds of disk slightly transversely striated medially. Mesonotum (Fig. 8A) slightly granulated before transverse sulcus and slightly transversely striate behind. Forewings (Fig. 8A–B) with veins indistinct, membrane distinct, including inner apical cell; bases of anteapical cells approximately aligned with claval apex. Remaining characteristics of external morphology as described for the genus by Young (1977: 747).

Coloration. Crown and face (Fig. 8A–B) black, with various rounded yellowed macula. Clypeus (Fig. 8C) black, with a pair of yellowed oval maculae on lateral margins. Lorum and gena (Fig. 8C) yellow, with smoky browned areas. Pronotum (Fig. 8A) anterior third blackened, with rounded yellowed maculae, posterior two-thirds black with smoky yellowed areas and yellow maculae. Mesonotum (Fig. 8A) anterior half black, with two pairs of yellow maculae, one laterally and the other medially; yellow posteriorly to transversal sulcus. Meso and metasternum (Fig. 8B) black. Forewing (Fig. 8A–B) browned, mottled with rounded yellow maculae, with a transversal yellow band from basal to anteapical portion. Legs (Fig. 8B–C) yellow, coxae lateral portions browned, tibia lateral portions reddened. Abdomen (Fig. 9A–B) blackened.

Male genitalia. Pygofer (Fig. 8D), in lateral view, strongly produced posteriorly, dorsal margin conspicuously concave preapically, apical portion slightly expanded, posterior margin subquadrangular; macrosetae distributed along the posterior two-thirds of disc. Valve (Fig. 8F), in ventral view, with a longitudinal median thickening, anterior margin with a reentrance medially. Subgenital plate (Fig. 8D), in ventral view, triangular, narrowing gradually towards apex, inner margin rectilinear, outer margin with a uniseriate row of macrosetae; in lateral view, reaching pygofer posterior third, dorsal margin with multiseriate rows of microsetae. Style (Fig. 8E), in dorsal view, elongate, extending posteriorly beyond apex of connective, outer margin apical portion bearing microsetae, slightly directed outwards, apex truncated. Connective (Fig. 8E), in dorsal view, V-shaped, arms and stalk short, with a median keel. Aedeagus (Fig. 8G–H), in lateral view, shaft conspicuously curved ventrally, with rounded apex; aedeagal atrium well developed, forming a sheath-like structure directed anteroventrally, attaining shaft's apex, with a pair of elongate basidorsal processes, with acute apex, directed posteriorly and trespassing shaft's apex; in ventral view, anterior margin narrowly projected anteriorly, posterior margin of atrium with a strong reentrance medially, forming two distinct rounded lobes laterally; basidorsal processes apical portions subparallel.

Female genitalia. Pygofer (Fig. 9B), in lateral view strongly produced posteriorly, posterior margin triangular, macrosetae along ventral and posterior margins. Abdominal sternite VII (Fig. 9A–C) as long as wide, posterior margin emarginated medially, forming a pair of rounded lobes laterally, posterolateral corners slightly directed outwards. Valvifer I (Fig. 9D), in lateral view, rounded. Valvula I (Fig. 9D–E), in lateral view, blade narrowed apically, base with a lobated projection directed anteriorly, apex narrowly rounded, dorsal sculptured area strigate, extending from basal portion to apex and almost reaching

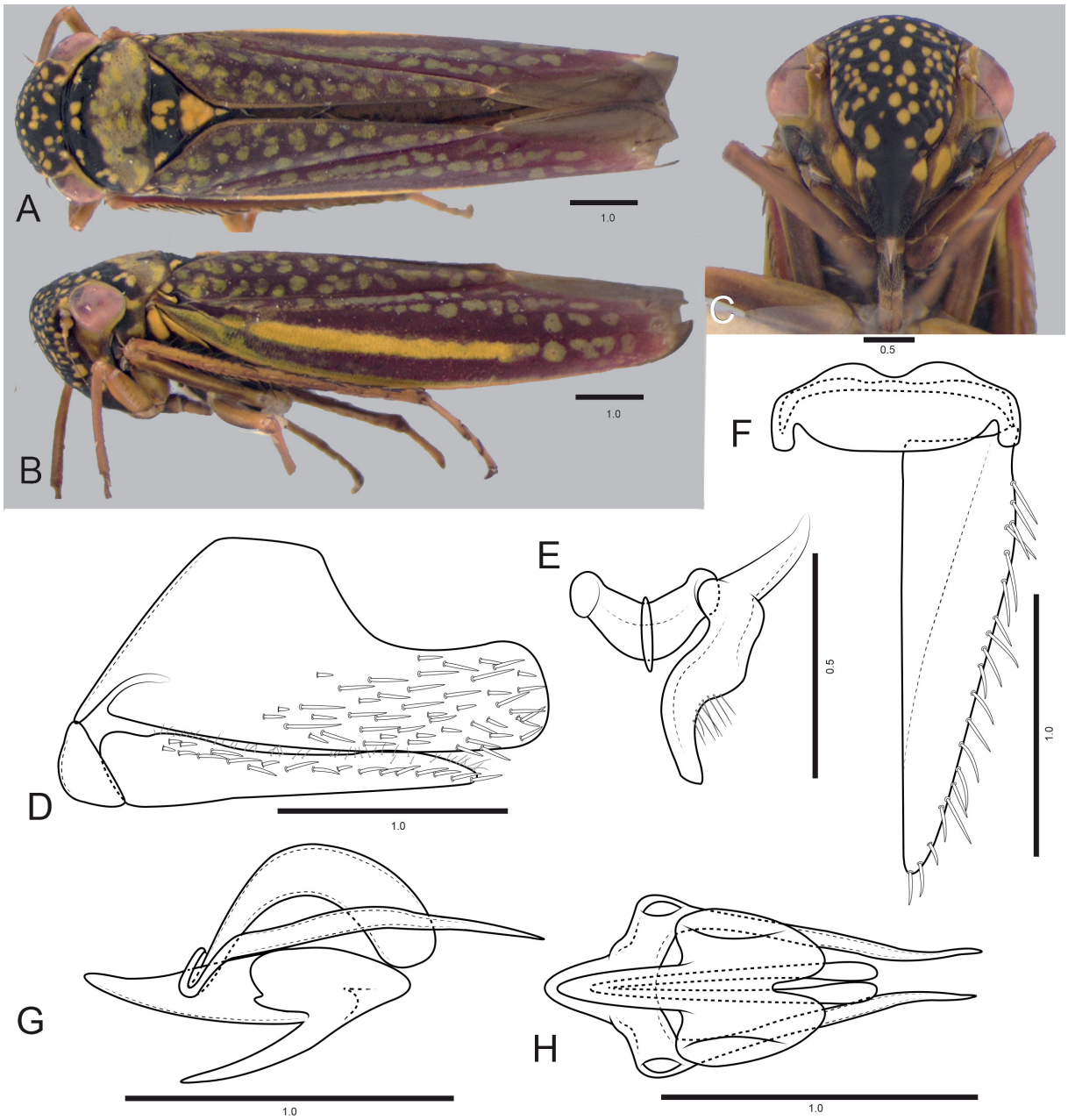

Fig. 8. *Ruppeliana delicata* sp. nov., holotype, ♂ (Brazil, Urubici, Parque Nacional São Joaquim; 17–18 Mar. 2012; Grossi, Parizotto and Leivas leg.; DZUP). **A**. Habitus, dorsal view. **B**. Habitus, lateral view. **C**. Head, frontal view. **D**. Pygofer, valve and subgenital plate, lateral view. **E**. Valve and subgenital plates, ventral view. **F**. Connective and style, ventral view. **G**. Aedeagus, lateral view. **H**. Aedeagus, ventral view. Scale bars in mm.

halfwidth of blade, ventral sculpted area strigate, extending from basal to apical portions. Valvula II (Fig. 9F–H), in lateral view, slightly expanded beyond basal curvature, narrowing gradually towards apex; without preapical prominence; apex rounded; dorsal margin with 55 continuous teeth, irregular shaped after basal curvature, robust and triangular at basal and median portions and small and trapezoid

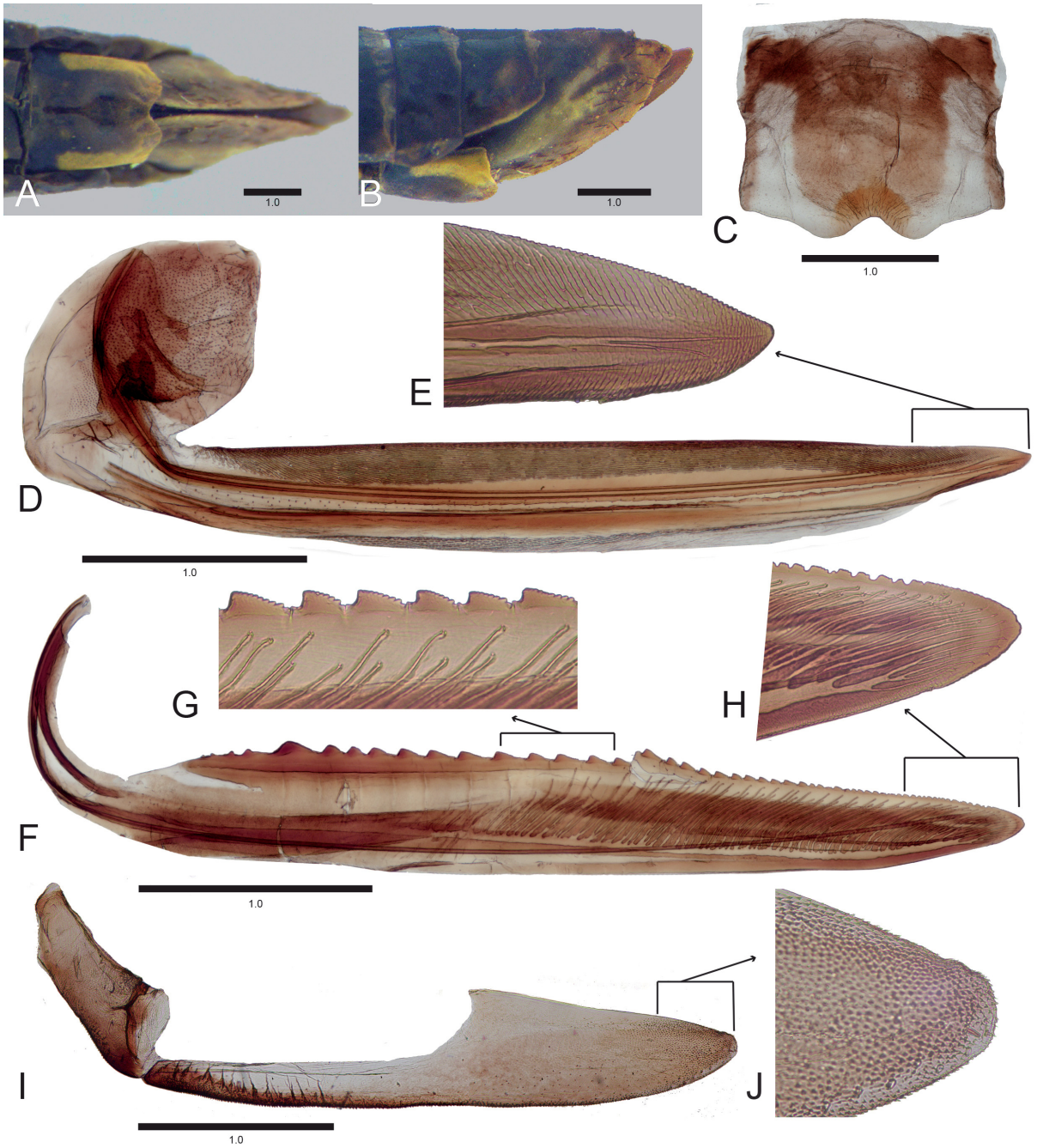

Fig. 9. *Ruppeliana delicata* sp. nov., paratype, ♀ (Brazil, Urubici, Parque Nacional São Joaquim; 17–18 Mar. 2012; Grossi, Parizotto and Leivas leg.; DZUP). **A**. Distal portion of abdomen, ventral view. **B**. Distal portion of abdomen, lateral view. **C**. Sternite VII, ventral view. **D**. First valvifer and first valvula, lateral view. **E**. Apical portion of first valvula. **F**. Second valvula, lateral view. **G**. Basal portion of second valvula. **H**. Apical portion of second valvula. **I**. Second valvifer and gonoplac, lateral view. **J**. Apical portion of gonoplac. Scale bars in mm.

or irregular shaped in apical portion, all bearing denticles. Gonoplac (Fig. 9I–J), in lateral view, with basal half narrow, bearing denticuli in ventral margin, apical half expanded; apex rounded, with apical surface bearing denticuli and few macrosetae in ventroposterior margin.

Remarks

Ruppeliana delicata sp. nov. and *R. longiphallus* share two distinct forewing marking patterns: longitudinal stripes and spots. However, *R. delicata* can be readily distinguished from *R. longiphallus* and all other species of *Ruppeliana* by its unique wing pattern, which features a single pair of lateral longitudinal stripes, with the remaining forewing surface mottled with spots. In contrast, *R. longiphallus* has four pairs of rounded basal spots on the forewings, each followed by a longitudinal stripe.

Ruppeliana robusta sp. nov.
urn:lsid:zoobank.org:act:73E45847-9A37-4153-8E8D-E241CF404762
Figs 10–11

Diagnosis

Large sharpshooters, about 10 mm (Fig. 10A–B). Crown and frons black, mottled with yellow spots. Forewing green, with veins and apex brownish. Pygofer (Fig. 10D), in lateral view, strongly produced posteriorly, dorsal margin concave preapically, posterior margin rounded. Subgenital plate in lateral view, reaching pygofer posterior third (Fig. 10D). Aedeagus shaft curved ventrally, with apex rounded (Fig. 10G). Aedeagal atrium with a basidorsal elongate process, with apex acute; in ventral view, dorsoapical portion of sheath-like structure forming subtriangular lobes laterally (Fig. 10H).

Etymology

The species epithet '*robusta*' comes from the Latin and means 'robust', referring to the overall large aspect of this species.

Type material

Holotype

BRAZIL – **Paraná State** • ♂; Guaratuba, Pontal do Paraná; elev. 1400 m; 16 Feb. 2009; P.C. Grossi and D.R. Parizotto leg.; DZUP.

Paratypes

BRAZIL – **Paraná State** • 1 ♂; same data as for holotype; DZUP • 2 ♀♀; same data as for holotype; 16 Apr. 2011; DZUP • 1 ♂; Tijucas do Sul, Morro do Araçatuba; elev. 1200–1600 m; 25–27 Feb. 2011; P.C. Grossi leg.; DZUP • 1 ♂; same data as for holotype; elev. 1600–1652 m; 31 Jan. 2012; Grossi and Santos leg.; DZUP • 2 ♀♀; Pontal do Itararé, Morro dos Perdidos; 25°53′27″ S, 48°57′27″ W; elev. 1423 m; 3 Feb. 2010; P.C. Grossi leg.; DZUP.

Description

Measurements (mm). Total length. Male holotype: 9.8. Paratypes (♂): 9.4–10.2 (n = 3); (♀) 10.9–11.6 (n = 4).

Head (Fig. 10A). In dorsal view, moderately produced anteriorly; anterior margin sub quadrangular; median length of crown ⅓ of interocular width and ½ of transocular width. Frons (Fig. 10C), in frontal view, texture slightly granular, muscular impressions indistinct; epistomal suture obsolete medially. Clypeus (Fig. 10C), in frontal view, without pubescence. Pronotum (Fig. 10A), in dorsal view, with lateral margins parallel, posterior two-thirds of disk slightly transversely striated medially. Mesonotum (Fig. 10A), in dorsal view, slightly granulated before transverse sulcus and slightly transversely striated

posteriorly. Forewings (Fig. 10A–B) with veins and membrane distinct, including apical cells posterior third; bases of anteapical cells approximately aligned with claval apex. Remaining characteristics of external morphology as described for the genus by Young (1977: 747).

Coloration. Crown and frons (Fig. 10A–C) black, mottled with yellowed spots. Clypeus (Fig. 10C) black, with yellowed maculae on lateral margins. Lorum and gena yellow (Fig. 10C). Pronotum (Fig. 10A) anterior third blackened, with various yellowed maculae, posterior two-thirds yellow;

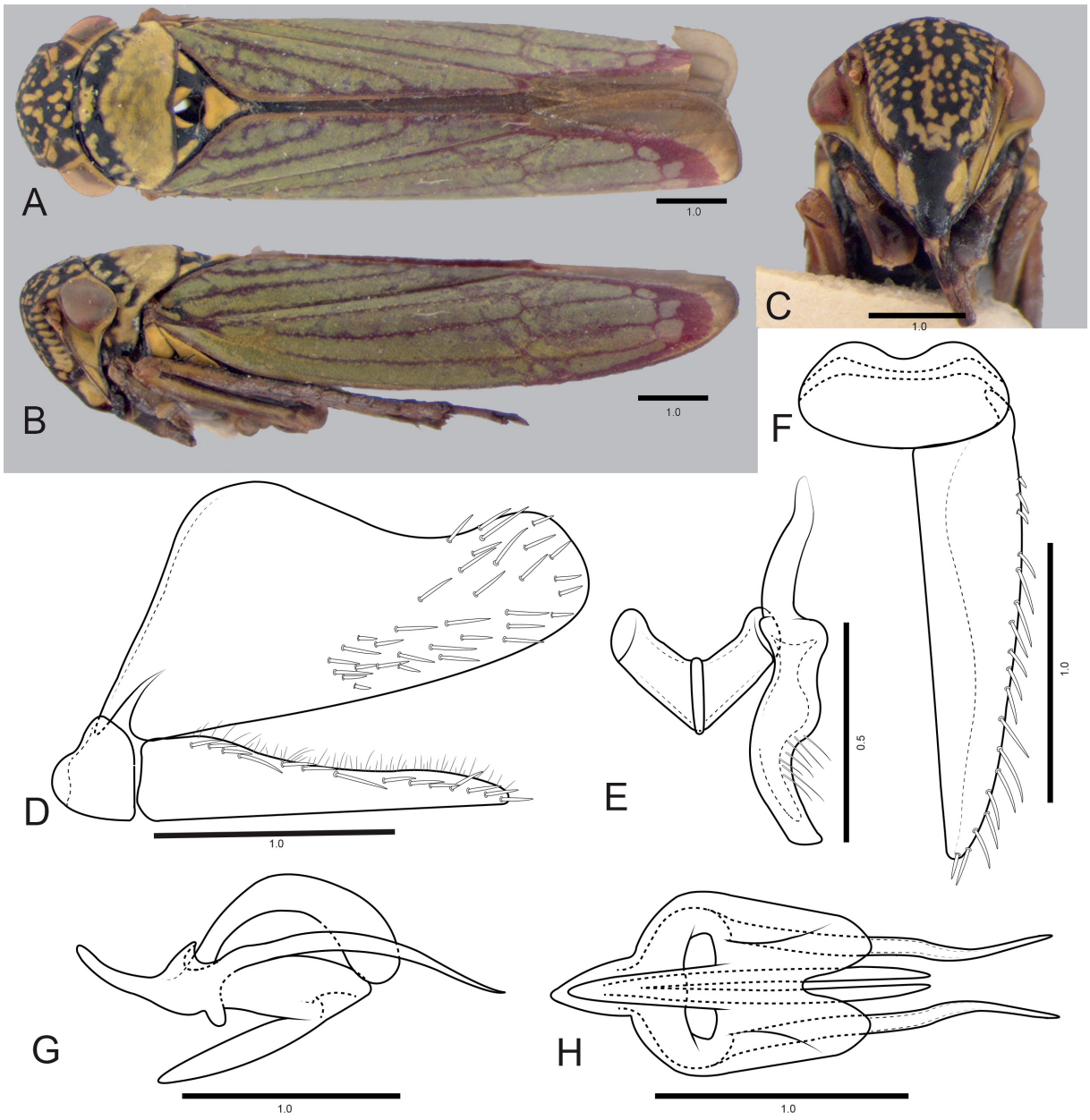

Fig. 10. *Ruppeliana robusta* sp. nov., holotype, ♂ (Brazil, Guaratuba, Pontal do Paraná; 1400 m; 16 Feb. 2009; P.C. Grossi and D.R. Parizotto leg.; DZUP). **A**. Habitus, dorsal view. **B**. Habitus, lateral view. **C**. Head, frontal view. **D**. Pygofer, valve and subgenital plate, lateral view. **E**. Valve and subgenital plates, ventral view. **F**. Connective and style, ventral view. **G**. Aedeagus, lateral view. **H**. Aedeagus, ventral view. Scale bars in mm.

posterior margin outlined in black. Mesonotum (Fig. 10A) anterior half black, with a pair of triangular maculae laterally and a yellow spot medially; yellowish posteriorly to transversal sulcus. Meso and metasternum (Fig. 10B–C) yellow. Forewing (Fig. 10A–B) green, with veins and apex browned. Legs

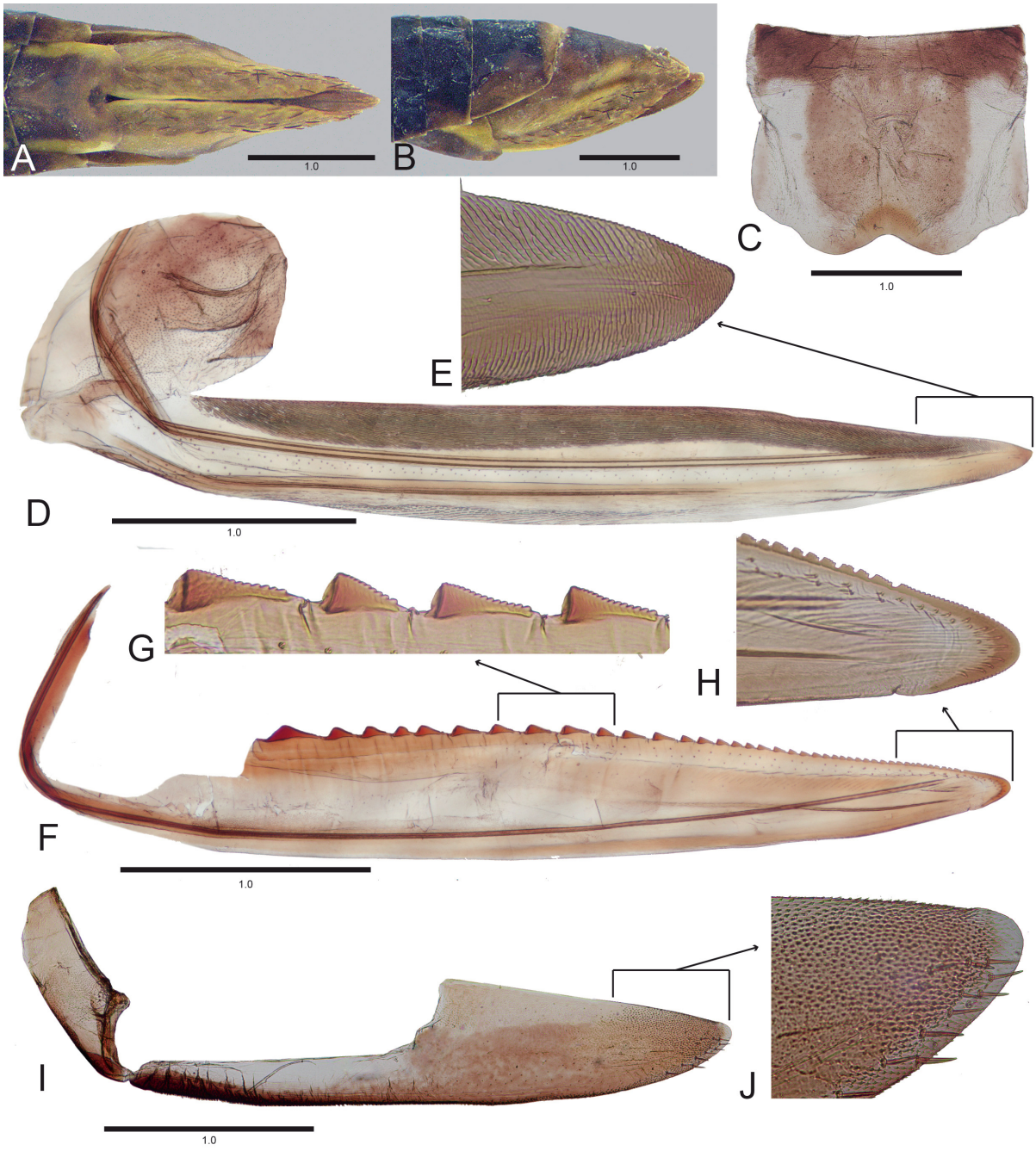

Fig. 11. *Ruppeliana robusta* sp. nov., paratype, ♀ (Brazil, Guaratuba, Pontal do Paraná; 1400 m; 16 Apr. 2011; P.C. Grossi and D.R. Parizotto leg.; DZUP). **A**. Distal portion of abdomen, ventral view. **B**. Distal portion of abdomen, lateral view. **C**. Sternite VII, ventral view. **D**. First valvifer and first valvula, lateral view. **E**. Apical portion of first valvula. **F**. Second valvula, lateral view. **G**. Basal portion of second valvula. **H**. Apical portion of second valvula. **I**. Second valvifer and gonoplac, lateral view. **J**. Apical portion of gonoplac. Scale bars in mm.

(Fig. 10B) brown with coxae outer margins yellow. Abdomen (Fig. 11A–B) blackened, with terminalia outlined in yellow.

Male genitalia. Pygofer (Fig. 10D), in lateral view, strongly produced posteriorly, dorsal margin concave preapically, posterior margin rounded; macrosetae distributed along the posterior two-thirds of disc. Valve (Fig. 10F), in ventral view, with a longitudinal median thickening, anterior margin with a reentrance medially. Subgenital plate (Fig. 10D), in ventral view, triangular, narrowing gradually towards apex, inner margin rectilinear, outer margin with a uniseriate row of macrosetae; in lateral view, reaching pygofer posterior third, dorsal margin with multiseriate rows of microsetae. Style (Fig. 10E), in dorsal view, elongate, extending posteriorly beyond apex of connective, apical portion slightly directed outwards and bearing microsetae, apex truncated. Connective (Fig. 10E), in dorsal view, V-shaped, arms and stalk short, with a median keel. Aedeagus (Fig. 10G–H), in lateral view, shaft conspicuously curved ventrally, apex rounded; aedeagal atrium well developed, forming a sheath-like structure directed anteroventrally, attaining shaft's apex, with a pair of elongate basidorsal processes, directed posteroventrally, with apex acute and surpassing shaft's apex; in ventral view, anterior margin narrowly projected anteriorly, posterior margin of atrium with a strong reentrance medially, forming two distinct subtriangular lobes laterally; basidorsal processes apexes slightly divergent.

Female genitalia. Pygofer (Fig. 11B), in lateral view strongly produced posteriorly, posterior margin triangular, macrosetae along ventral and posterior margins. Abdominal sternite VII (Fig. 11B–C) as long as wide; posterior margin emarginated medially, forming a pair of rounded lobes laterally; posterolateral corners subparallel. Valvifer I (Fig. 11D), in lateral view, rounded. Valvula I (Fig. 11D–E), in lateral view, blade narrowed apically; base with a lobated projection directed anteriorly, apex narrowly rounded; dorsal sculptured area strigate, extending from basal portion to apex and almost reaching halfwidth of blade, ventral sculpted area strigate, extending from basal to apical portions. Valvula II (Fig. 11F–H), in lateral view, slightly expanded beyond basal curvature, narrowing gradually towards apex; without preapical prominence; apex rounded; dorsal margin with 40 continuous teeth, robust and triangular at basal and median portions followed by small and trapezoid in apical portion, both bearing denticles. Gonoplac (Fig. 11I–J), in lateral view, with basal half narrow, apical half expanded; apex rounded, with apical surface bearing denticuli and macrosetae along ventroposterior margin.

Remarks

Ruppeliana robusta sp. nov. can be distinguished from all other species of *Ruppeliana* by its forewings, which lack stripes or spots but feature distinct veins and a brownish apex. To date, *R. robusta* is the only species in the genus with a subquadrangular posterior margin of the head.

Ruppeliana tridentata sp. nov.
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Figs 12–13

Diagnosis

Large sharpshooters, about 10 mm length (Fig. 12A–B). Crown yellow, with black marks (Fig. 12A). Frons yellow, with three longitudinal stripes, two laterally, one medially, connecting each other posteriorly (Fig. 12C). Forewings mottled with pale spots (Fig. 12A). Male pygofer strongly produced posteriorly, with a slight reentrance preapically in dorsal margin, subgenital plate not surpassing apical third (Fig. 12D). Connective U-shaped, style with apex obtuse (Fig 12F). Aedeagus shaft with apex truncated (Fig. 12G). Aedeagal atrium with an elongate basidorsal process, with apex acute and a pair of lobate processes dorsoapically at the sheath-like portion (Fig. 12H).

Etymology

The species epithet '*tridentata*' is derived from the Latin, where the word 'trident' means 'three teeth'. This refers to the trident-shaped maculae present on the specimen's frons.

Type material

Holotype

BRAZIL – **Rio de Janeiro State** • ♂; Parque Nacional Serra dos Órgãos (PARNASO); Jun. 2007; Laboratório de Ecologia de Insetos, UFRJ leg.; MNRJ.

Paratypes

BRAZIL – **Rio de Janeiro State** • 1 ♀; same data as for holotype; MNJR; 1 ♂, 1 ♀; same data as for holotype; DZUP.

Description

Measurements (mm). Total length. Male holotype: 9.5. Paratypes (♂): 8.9 (n = 1); (♀) 9.7–9.9 (n = 2).

Head (Fig. 12A). In dorsal view, moderately produced anteriorly, anterior margin rounded, median length of crown approximately ⅓ of interocular width and approximately ⅓ of transocular width. Frons (Fig. 12C), in lateral view, with a slight anteapical process, in frontal view, texture slightly granular, muscular impressions indistinct, epistomal suture complete. Clypeus (Fig. 12C) without pubescence. Pronotum (Fig. 12A), in dorsal view, with lateral margins parallel, posterior two-thirds of disk slightly transversely striated medially. Mesonotum (Fig. 12A) slightly granulated before transverse sulcus and slightly transversely striated posteriorly. Forewings (Fig. 12A–B) with veins indistinct; membrane distinct, including inner apical cell and posterior third of remaining apical cells, bases of anteapical cells approximately aligned with claval apex. Remaining characteristics of external morphology as described for the genus by Young (1977: 747).

Coloration. Crown (Fig. 12A) yellow, with blackened marks. Frons (Fig. 12C) yellow, with a longitudinal trident-shaped maculae: two bands laterally and one medially, connected posteriorly. Clypeus (Fig. 12C) black, anterolateral margins yellow. Lorum and gena (Fig. 12C) yellow and black, respectively. Pronotum (Fig. 12A) anterior third yellow, with black maculae, posterior two-thirds browned, with yellowed areas laterally, posterior margin black. Mesonotum (Fig. 12A) yellow, with two inverted triangular black maculae laterally. Meso and metasternum (Fig. 12B) black. Forewing (Fig. 12A–B) browned, mottled with paler spots, costal margin smoky yellow basally. Legs (Fig. 12B–C) yellow, tibia anterior portion browned. Abdomen (Fig. 13A–B) blackened with lateral portions paler.

Male genitalia. Pygofer (Fig. 12D), in lateral view, strongly produced posteriorly, dorsal margin with a slight reentrance preapically, posterior margin rounded, macrosetae distributed from basal to ventroapical portions. Valve (Fig. 12E), in ventral view, narrow, lateral margins acute anteriorly, ventral margin slightly concave. Subgenital plate (Fig. 12D), in ventral view, triangular, narrowing gradually towards apex, inner margin rectilinear, outer margin with a multiseriate row of macrosetae; in lateral view, broadened, not reaching pygofer apical portion. Style (Fig. 12F), in dorsal view, elongate, extending posteriorly beyond apex of connective, outer margin with a slight median lobe, apical portion slightly curved outwards and outer margin bearing microsetae, apex obtuse. Connective (Fig. 12F), in dorsal view, U-shaped, arms short, with a median keel. Aedeagus (Fig. 12G–H), in lateral view, shaft slightly curved ventrally, with apex truncated; aedeagal atrium well developed, forming a sheath-like structure, directed anteroventrally, not trespassing shaft's posterior half; with a pair of elongate narrowed basidorsal processes, with acute apex, directed posteriorly and trespassing much far as shaft's apex, and a pair of lobate processes dorsoapically; in ventral view, anterior margin of atrium slightly concave, with a pair of lobated processes laterally, posterior margin projected medially; basidorsal processes apical portions slightly convergent or subparallel.

Female genitalia. Pygofer (Fig. 13B), in lateral view strongly produced posteriorly, posterior margin triangular, macrosetae along ventral margin. Abdominal sternite VII (Fig. 13B–C) as long as wide; posterior margin with a slight tip medially, posterolateral corners convergent. Valvifer I (Fig. 13D), in lateral view, rounded. Valvula I (Fig. 13D–E), in lateral view, blade narrowed apically, apex narrowly rounded; dorsal sculptured area strigate, extending from basal portion to apex, reaching halfwidth of blade, ventral sculpted area strigate, restricted to apical portions. Valvula II (Fig. 13F–I), in lateral view, slightly expanded beyond basal curvature, narrowing gradually towards apex, without preapical

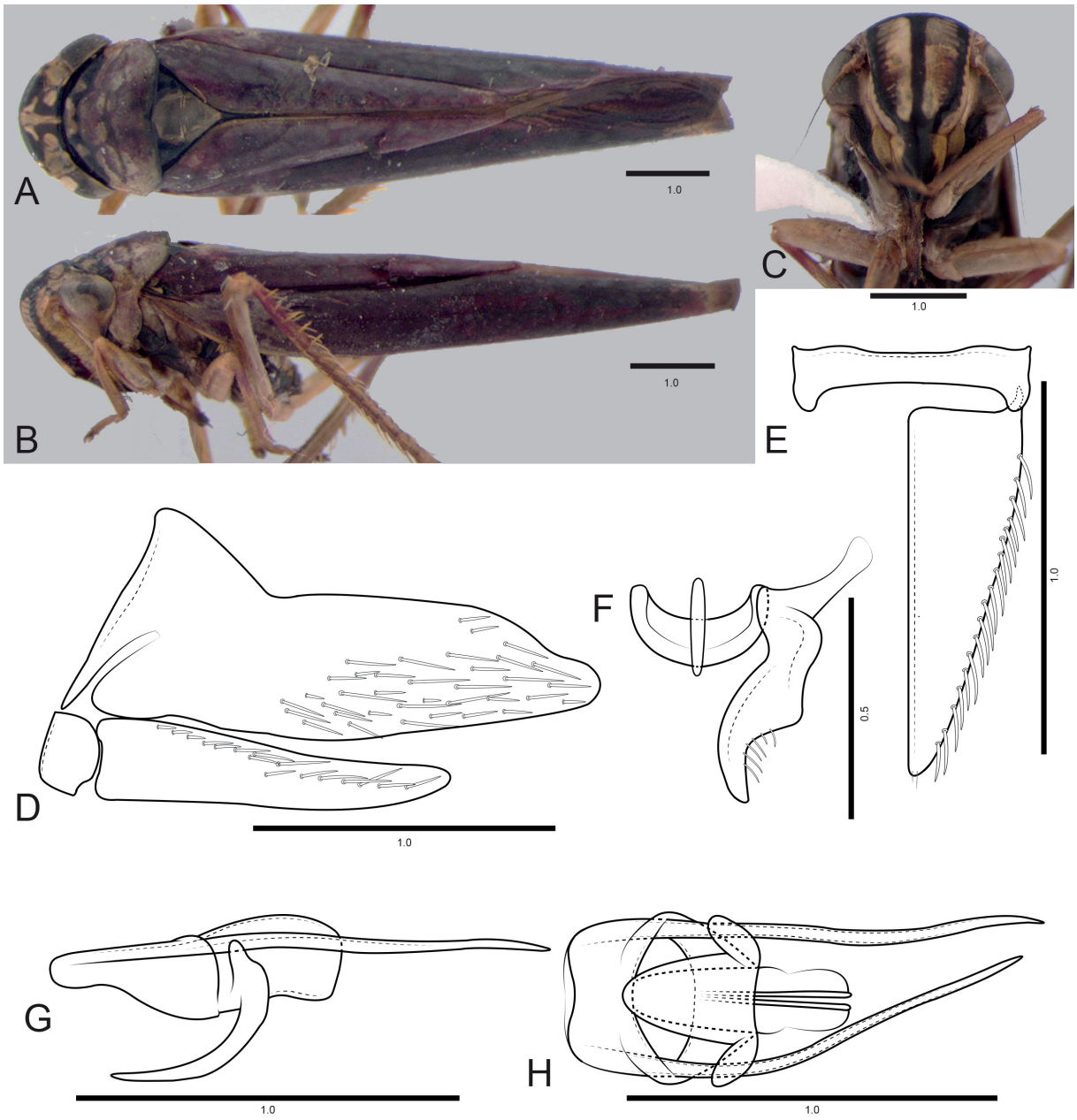

Fig. 12. *Ruppeliana tridentata* sp. nov., holotype, ♂ (Brazil, Parque Nacional Serra dos Órgãos (PARNASO); Jun. 2007; Laboratório de Ecologia de Insetos, UFRJ leg.; MNRJ). **A**. Habitus, dorsal view. **B**. Habitus, lateral view. **C**. Head, frontal view. **D**. Pygofer, valve and subgenital plate, lateral view. **E**. Valve and subgenital plates, ventral view. **F**. Connective and style, ventral view. **G**. Aedeagus, lateral view. **H**. Aedeagus, ventral view. Scale bars in mm.

prominence, apex rounded; dorsal margin with 45 continuous teeth, irregular shaped in basal curvature, robust and subtriangular at basal and median portions, small and rounded in apical portion, all bearing denticles. Gonoplac (Fig. 13I–J), in lateral view, with basal half narrow, apical half expanded; apex rounded, with apical surface bearing denticuli and macrosetae along ventroposterior margin.

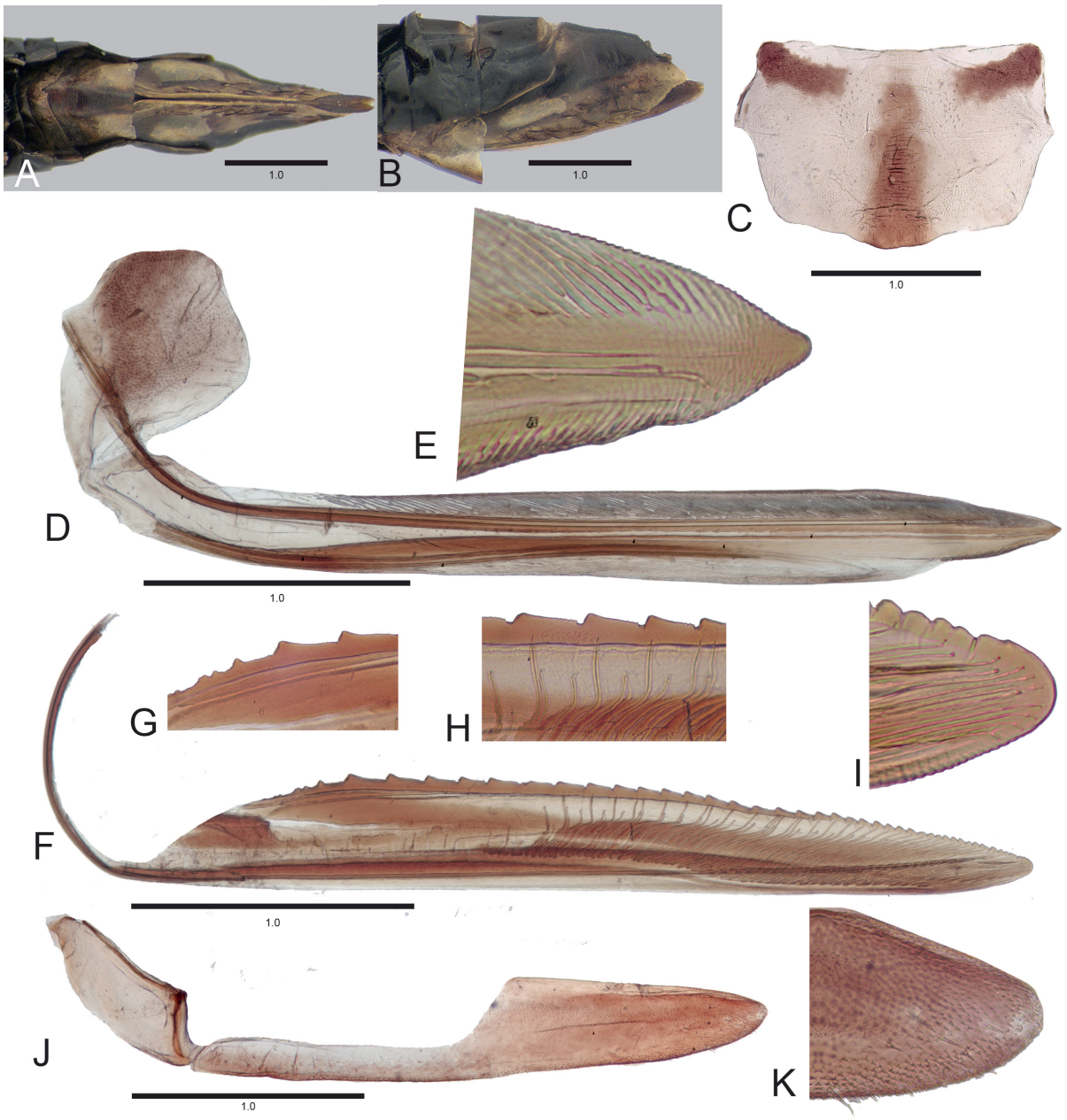

Fig. 13. *Ruppeliana tridentata* sp. nov., paratype, ♀ (Brazil, Parque Nacional Serra dos Órgãos (PARNASO); Jun. 2007; Laboratório de Ecologia de Insetos, UFRJ leg.; MNRJ). **A**. Distal portion of abdomen, ventral view. **B**. Distal portion of abdomen, lateral view. **C**. Sternite VII, ventral view. **D**. First valvifer and first valvula, lateral view. **E**. Apical portion of first valvula. **F**. Second valvula, lateral view. **G**. Basal portion of second valvula. **H**. Apical portion of second valvula. **I**. Second valvifer and gonoplac, lateral view. **J**. Apical portion of gonoplac. Scale bars in mm.

Remarks

The specimens of *Ruppeliana tridentata* sp. nov. at hand were placed along *R. grossii* specimens, due to the same locality in the precedence label. However, they can be promptly differentiated by the overall coloration: while *R. tridentata* presents the entire forewing mottled with spots, *R. grossii* is remarkably blackened with few yellow spots in forewings basal half. Additionally, the pygofer in *R. grossii* is narrowed towards the apex, which is narrowly rounded, whereas in *R. tridentata*, dorsal margin with a slight reentrance preapically, and apex rounded. Until today, *R. tridentata* is known only from its type locality, Parque Nacional da Serra dos Órgãos (PARNASO), located in Teresópolis city, from Rio de Janeiro State.

Ruppeliana grossi Cavichioli *et al.*, 2017
Fig. 14

Neotype designation

The designation of a neotype was necessary due to the tragic fire at MNRJ, which resulted in the loss of many holotypes (see Discussion), and it fulfills the requirements of Article 75.3.4 of the International Code of Zoological Nomenclature (ICZN 1999). Fortunately, during this study we found a series of *R. grossi* specimens deposited in DZUP, previously identified by one of the species' authors (R.R. Cavichioli), fulfilling Article 73.3.3 of the ICZN. Additionally, these specimens are topotypic with the paratypes designated in the original description, thereby meeting the requirements of Article 75.3.6 of the ICZN.

Material examined

Neotype (here designated)
BRAZIL – **Rio de Janeiro State** • ♂; Nova Friburgo, Pico do Caledônia; elev. 2219 m; 14 Jan. 2009; P.C. Grossi leg.; DZUP.

Other material examined
BRAZIL – **Rio de Janeiro State** • 9 ♂♂, 3 ♀♀; same data as for neotype; DZUP • 2 ♂♂, 2 ♀♀; same data as for neotype; Jan. 2008; DZUP • 1 ♀ same data as for neotype; 1 Jan. 2014; DZUP.

Fig. 14. *Ruppeliana grossii* Cavichioli *et al.*, 2017, neotype (DZUP). **A**. Habitus, dorsal view. **B**. Habitus, lateral view. **C**. Habitus, frontal view. **D**. Label. Scale bars in mm.

Remarks

The examined specimens of *R. grossi* exhibit external morphological features identical to those described and illustrated in the original work, with the coloration of the wings and maculae matching the original description. Additionally, all previously dissected specimens were compared with the original description, and their characteristics corresponded fully.

Key to species of Ruppeliana (males)

1. Forewings without any stripes or maculae (Figs 10A–B, 15A) ..... ***R. robusta*** sp. nov.
– Forewings with stripes and/or maculae (Fig. 15B–E) 2

2. Forewings marked with both longitudinal, and rounded maculae (Figs 8A–B, 15B) 3
– Forewings marked with longitudinal, transversal, or rounded maculae (Fig. 15C–E) 4

3. Forewings with rounded maculae basally, followed by a longitudinal stripe (Cavichioli *et al.* 2017: fig. 15) ..... ***R. longiphallus*** Cavichioli *et al.* 2017
– Forewing's mottled with spots, with a longitudinal stripe in costal margin (Fig. 15B) .... ***R. delicata*** sp. nov.

4. Forewings marked with longitudinal maculae (Fig. 15C) 5
– Forewings marked with transverse or rounded maculae (Fig. 15D–E) 7

5. Aedeagus basidorsal processes not surpassing shaft's length (Carvalho *et al*. 2014: fig. 22) .... ***R. flavivirescens*** Carvalho *et al.* 2014
– Aedeagus dorsal processes surpassing shaft's length (Fig. 1G) 6

6. Subgenital plates attaining to pygofer's apex, which, in dorsal view, is directed inwards (Figs 1D, 16A) ..... ***R. coronata*** (Signoret, 1853)
– Subgenital plate not attaining to pygofer's apex, which is not directed inwards in dorsal view (Figs 3D, 16B) ..... ***R. nigripes*** (Signoret, 1853)

7. Forewings marked with transverse maculae (Fig. 15D) 8
– Forewings marked with rounded maculae (Fig. 15E) 12

8. Forewings transverse maculae greenish, almost reaching each other (Fig. 15D) .... ***R. signiceps*** (Stål, 1862).
– Forewings transverse maculae bluish and distant from each other 9

9. Aedeagal atrium dorsal margin with a pair of subapical projections (Young 1977: 750, fig. 612f) 10
– Aedeagal atrium dorsal margin without projections (Young 1977: 752, fig. 614f) 11

10. Aedeagus shaft expanded preapically, with apex truncated; aedeagal atrium subapical processes short and triangular (Young 1977: 750, fig. 612f) ..... ***R. episcopalis*** Young, 1977
– Aedeagus shaft curved ventrally, with apex rounded; aedeagal atrium subapical processes short and spiniform (Carvalho *et al.* 2014: fig. 7) ..... ***R. caelimaculata*** Carvalho *et al.* 2014

11. Aedeagus with only one pair of basidorsal processes (Young 1977: 752, fig. 614f) .... ***R. glaucomaculata*** (Germar, 1821)
– Aedeagus with two pairs of processes, one basidorsal and one basiventral (Young 1977: 753, fig. 617f) ..... ***R. tatia*** Young, 1977

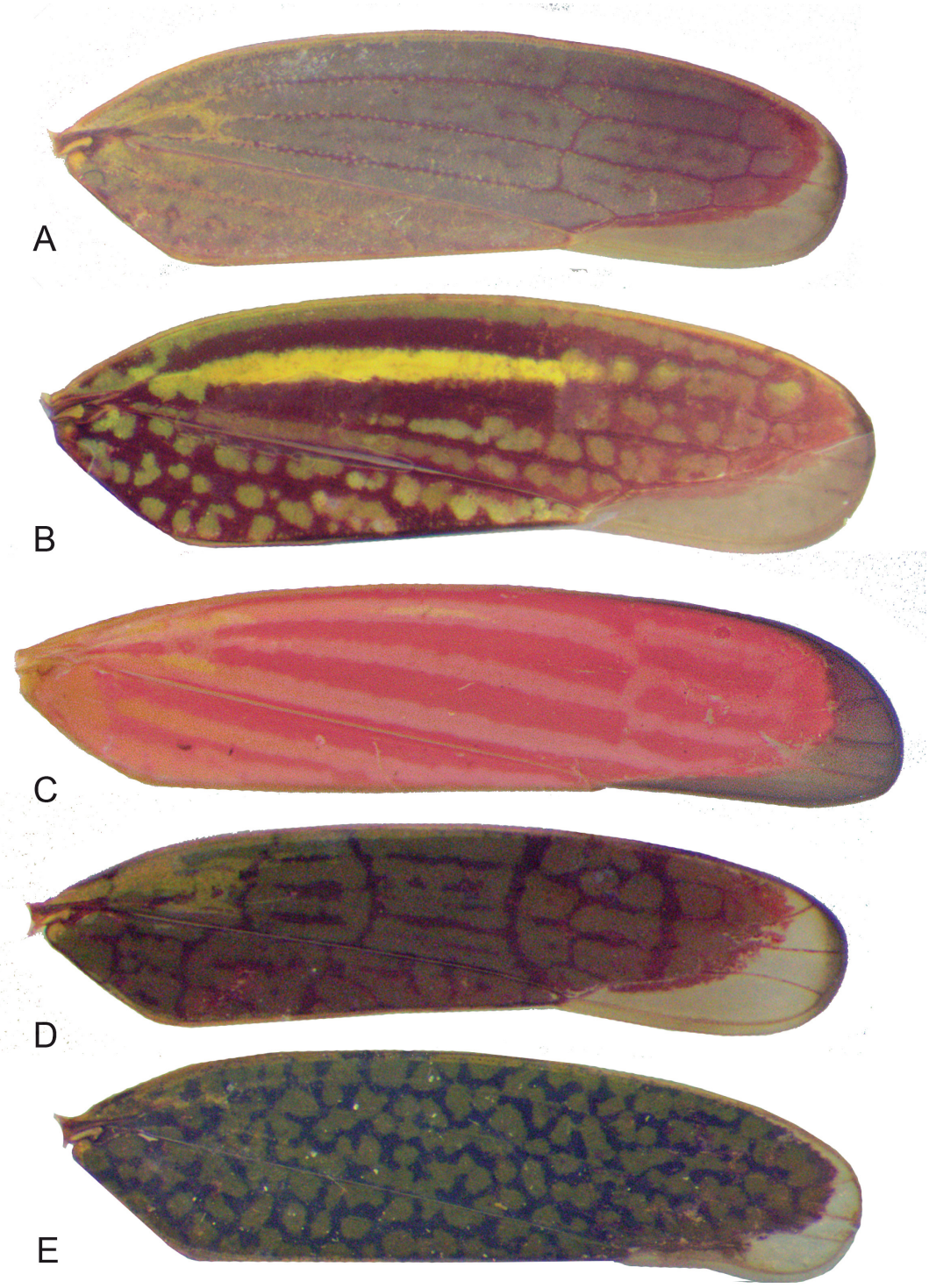

Fig. 15. *Ruppeliana* Young, 1977, forewing patterns. **A**. *R. robusta* sp. nov., paratype, ♂ (Brazil, Guaratuba, Pontal do Paraná; 1400 m; 16 Apr. 2011; P.C. Grossi and D.R. Parizotto leg.; DZUP). **B**. *R. delicata* sp. nov., holotype, ♂ (Brazil, Urubici, Parque Nacional São Joaquim; 17–18 Mar. 2012; Grossi, Parizotto and Leivas leg.; DZUP). **C**. *R. coronata* (Signoret, 1853), ♀ (Brazil, Itatiaia, parque Nacional do Iatatiaia, 28 Oct. 2011; R.R. Cavichioli leg.; DZUP). **D**. *R. signiceps* (Stål, 1862), ♂ (Brazil, Piraquara, Mananciais da Serra, 10 Oct. 2021; A.C. Domahovski leg.; DZUP). **E**. *R. fulva* (Taschenberg, 1884), ♀ (Brazil, São José dos Pinhais, 21 Sep. 2011; A.C. Domahovski leg.; DZUP).

12. Forewings mottled with small rounded maculae (Fig. 15E) 13
– Forewings with large and sparse rounded maculae (Fig. 14A–B) 14

13. Subgenital plates not attaining pygofer apex in lateral view (Fig. 12D) ..... ***R. tridentata*** sp. nov.
– Subgenital plates attaining pygofer apex in lateral view (Fig. 3D) .....***R. fulva*** (Taschenberg, 1884)

14. Rounded maculae restricted to forewings basal portion (Fig. 14A–B) .....
.....***R. grossii*** Cavichioli *et al.* 2017
– Rounded maculae distributed along the entire forewing (Cavichioli *et al*. 2017: fig. 1) 15

15. Aedeagus processes surpassing shaft's length (Cavichioli *et al.* 2017: fig. 5) .....
..... ***R. barbarensis*** Cavichioli *et al.* 2017
– Aedeagus processes not attaining to shaft's apex (Cavichioli *et al.* 2017: fig. 26) .....
.....***R. serrana*** Cavichioli *et al.* 2017

Occurrence map

The specimens of *Ruppeliana* under study were primarily collected in high-altitude regions (> 800 m), as indicated by label data (Fig. 17). In cases where altitude was not specified, the locality name "Serra" suggests a mountainous area and thus implies elevated terrain (see Supp. file 1).

In Rio de Janeiro State, multiple species were collected in mountainous regions. The type localities of *R. tridentata* sp. nov. and *R. grossii* are situated in Serra dos Órgãos National Park (PARNASO), with a median altitude of approximately 1600 m. Other collection sites include Caledônia Peak (2219 m), Macaé de Cima (1500 m), Revolta Valley (900 m), and Concórdia Mountain Range (1000 m), where species such as *R. longiphallus*, *R. signiceps*, *R. grossi*, and *R. episcopalis* have been recorded. In Minas

Fig. 16. Male pygofer in dorsal view. **A**. *Ruppeliana coronata* (Signoret, 1853) (Brazil, Itatiaia, Parque Nacional do Itatiaia; 30 Oct. 2011; R.R. Cavichioli leg; DZUP). **B**. *R. nigripes* (Signoret, 1853) (Brazil, São José do Barreiro, Parque Nacional da Bocaina; 1 Apr. 2010; G. Melo leg.; DZUP). Scale bars in mm.

Gerais State, *R. barbarensis* was collected in Caraça National Park (Caraça Mountain Range, 900 m), along with *R. episcopalis*. In Caratinga (average altitude 578 m), *R. glaucomaculata* was found. In Itamonte, part of the Mantiqueira Mountain Range (average altitude 1000 m), several species occur, including *R. barbarensis*, *R. coronata*, *R. flavivirescens*, *R. nigripes*, *R. serrana*, and *R. tatia*. Specimens of *R. nigripes* were also collected in Wenceslau Braz (1780 v) and Maria da Fé (1329 m) in olive orchards, based on recent studies (Froza *et al.* 2024). The Caparaó National Park, located on the Minas Gerais-Espírito Santo border (1984 m), yielded specimens of *R. serrana* and *R. fulva*.

In Espírito Santo State, *R. signiceps* and *R. caelimaculata* were collected in the Santa Lúcia Biological Station (600–900 m).

In São Paulo State, *R. coronata* was extensively collected in the Cantareira Mountain Range (800 m). *R. episcopalis* was recorded in Itapetininga (660 m), a city in the countryside. The Bocaina Mountain Range, a segment of the Serra do Mar shared with Rio de Janeiro, has an average altitude of 1600 m and also hosts multiple species occurrences, such as *R. nigripes*. This species was also collected in São Bento do Sapucaí (1512 m) in recent studies (Froza *et al.* 2024). In Paraná State, numerous specimens of *R. fulva* and *R. signiceps* were collected in São José dos Pinhais (880 m), Mananciais da Serra (1100 m), and the Private Nature Preserve (RPPN) Guaricica (200 m). *Ruppeliana robusta* sp. nov. was recorded on Araçatuba Hill (1600 m) and Perdidos Hill (1423 m).

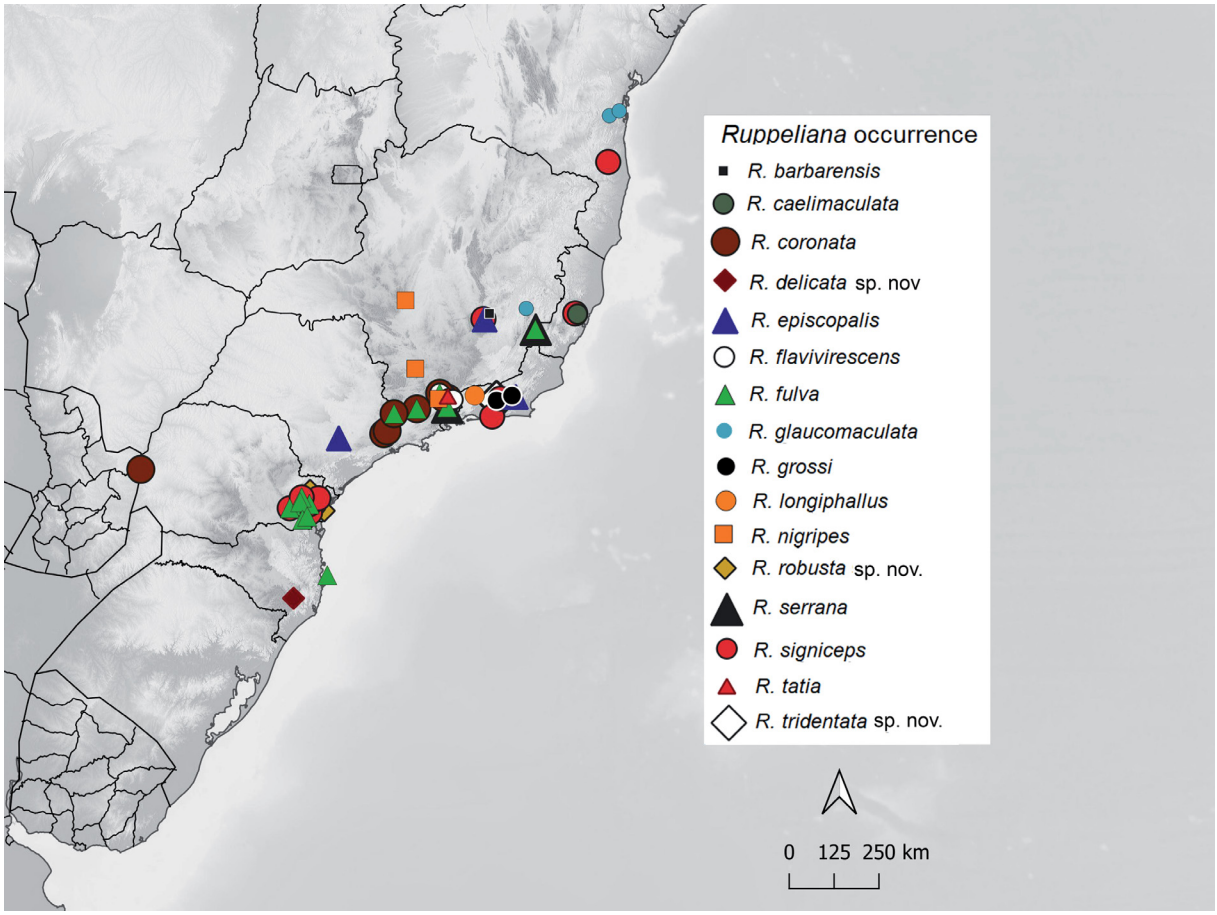

Fig. 17. *Ruppeliana* Young, 1977 distribution map.

In Santa Catarina State, a single specimen of *R. fulva* was collected in Rio Vermelho, in São Bento do Sul (850 m). The type locality of *R. delicata* sp. nov. is São Joaquim National Park, situated in the municipality of Urubici (1600 m).

The sole northeastern records are from Bahia State. *Ruppeliana signiceps* and *R. glaucomaculata* were recorded in Bonita Mountain Range, in Camacã (800 m), and in the coastal locality of Igrapiúna, respectively.

Discussion

Recent discoveries of new species and genera of Cicadellini in southern and southeastern Brazil (Côrte *et al.* 2021; Froza *et al.* 2021; Felix *et al.* 2022; Froza & Mejdalani 2022; Domahovski *et al.* 2023; Mejdalani *et al.* 2023, 2024; Pecly *et al.* 2024) highlight the still unexplored diversity of these regions and reinforce the urgent need for continued specimen collections and taxonomic researches. This need is particularly critical in the face of ongoing environmental degradation and the accelerating impacts of climate change.

In the present study, detailed descriptions of external morphology and genitalia, accompanied by images and illustrations, were made possible through access to high-quality material and adequate resources. Such documentation plays a fundamental role in updating and facilitating the identification of these taxa, thereby contributing to the accuracy future studies.

Although species of *Ruppeliana* are typically colorful, coloration should not be relied upon for criterion is not recommended for species identification, contrary to what is suggested by Cavichioli *et al.* (2017). This is due to variation in color that results from preservation conditions of the specimens, which can lead to misidentifications. However, based on the observation of numerous specimens, the shape and arrangement of maculae on the forewings remain consistent within species, even in faded individuals. This consistency supported the use of forewing maculae patterns in the identification key proposed herein. To improve reliability, the key also incorporates male genitalia characteristics.The genus *Ruppeliana* currently encompasses 16 species, distributed across the throughout southeastern and southern Brazil. Despite the high diversity, all species share well-conserved morphological features, particularly the aedeagus structure, which consistently presents a ventrally curved shaft with at least one pair of basiventral processes. A similar aedeagus shape occurs in *Macugonalia* Young, 1977, although this genus lacks the flange-shaped atrium on the ventral margin. Moreover, the subgenital plate in *Macugonalia* does not extend beyond the posterior half of the pygofer, which helps distinguish this genus from *Ruppeliana*. These diagnostic traits support the hypothesis that *Ruppeliana* is a monophyletic genus within Cicadellini, though a formal phylogenetic analysis is still required to confirm this hypothesis.

The Coleção Entomológica Padre Jesus Santiago Moure (DZUP) houses 171 specimens of *Ruppeliana*, representing all known species except *R. barbarensis* and R. *longiphallus*. Contrary to the original description, the collection does not contain any paratypes or specimens of *R. barbarensis*. Unfortunately, the type material of the species *R. grossii*, *R. barbarensis*, *R. longiphallus*, and *R. serrana* was destroyed in the fire that devasted the São Cristóvão Palace, Museu Nacional do Rio de Janeiro, where it had been deposited. During the course of this study, a specimen of *R. serrana* was located at DZUP, now the only known individual of this species. Additionally, although the type of *R. grossii* was lost, a series of topotypic specimens identified by the original author is preserved at DZUP. These fulfill the requirements for a neotype designation as outlined by the International Code of Nomenclature (ICZN 1999: 75.3.3, 75.3.4, 75.4.1). This case underscores the importance of maintaining comprehensive records and duplicate specimens, which are essential for ensuring the continuity and reliability of future taxonomic research.

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Supplementary file

Supp. file 1. Altitude of collected specimens of *Ruppeliana* Young, 1977.
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