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Research Article

REDESCRIPTION OF THE FEMALE OF *POLANA AMAPAENSIS* COELHO (HEMIPTERA: CICADELLIDAE), WITH EMPHASIS ON GENITAL STRUCTURES

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ABSTRACT

Polana amapaensis Coelho, 1991 has its ovipositor described and illustrated, based on the examination of the female paratype, from Amapá State, Brazil. This is the first detailed description of the female genitalia of a *Polana* DeLong, 1942 species. We compared the female genitalia of *P. amapaensis* with those of other Gyponini genera. Our results confirm that the female genitalia in this tribe can be a source of useful taxonomic characteristics.

Keywords: Taxonomy, Morphology, Leafhopper, Gyponini, Neotropics.

INTRODUCTION

The genus *Polana* DeLong (Cicadellidae: Iassinae: Gyponini) includes about 150 described species with restricted distribution to the Americas, especially in the tropical zone. For most of the species we know only the male, and when the female is known, there is only reference to the seventh sternite as the genital structures (DeLong and Freytag, 1972; Coelho, 1991). Described from Amapá and, to the present, with known distribution restricted to this Brazilian state, *P. amapaensis* Coelho has a type-series composed by two specimens, male holotype and female paratype (Coelho, 1991). Based on the examination of the paratype, a more detailed study of the female genitalia was provided.

MATERIAL AND METHODS

The descriptive terminology adopted herein follows mainly Young (1977), except for the female terminalia (Balduf, 1934; Blocker and Triplehorn, 1985). Techniques for preparation of genital structures follow Oman (1949). The end of the abdomen of the specimen was removed and diaphanized in potassium hydroxide (water bath), after which the pieces were highlighted and observed under microscope. Photographs were taken with a digital camera EC3 attached to

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a stereomicroscope Leica S8AP0, and a camera DMC 2900 attached to a microscope Leica DM4000 B LED, using the image stacking software CombineZP. Terminalia were stored in a small vial with glycerin pinned below the paratype. The specimens were collected in the 1960s, in an area of the Amazon rainforest, northern Brazil. The type series of *Polana amapaensis* is housed in Museu Nacional, Universidade Federal do Rio de Janeiro, Brazil.

RESULTS

Polana amapaensis Coelho

Redescription of female (Figure 1-2)

Length 7 mm. Crow reddish-brown, transversely striated, area between eyes dark-brown; transocular width 5.3 times median length, inter-ocular width 2.6 times median length; eyes and ocelli dark-brown; transocular width about 4/5 of pronotum humeral width (Figure 1A-B). Face with clypeus reddish-brown, lora and gena pale-yellow; eye contour and depression at base of scape dark-brown (Figure 1C); clypeus length about 1.3 times width, apical margin slightly indented medially (Figure 1C-D).

Pronotum reddish-brown, transversely striated, areas anterior (behind each eye) and central dark-brown; maximum width 2.1 times median length. Scutellum reddish-brown, latero-basal angles dark-brown (Figure 1 A-B). Forewings brown, semitransparent, venation with dark-brown thin contour; 3 times longer than wide; appendix well developed.

Sternite VII (Figure 1E-F) 1.9 times longer than preceding segment, pale-yellow with dark-brown pigmentation widening from middle third of anterior margin to lateral angles of posterior margin; lateral length slightly shorter than median length; lateral margin with median compression, posterolateral corners rounded; posterior margin with rounded excavation each side of wider central lobe (Coelho, 1991); maximum width about twice median length. Pygofer, in lateral view, approximately triangular shape, with apex rounded; sets of macrosetae at middle-posterior portion (Figure 1G).

First valvifer approximately rectangular (Figure 2A). Valvula I (Figure 2A-C), in lateral view, about 5 times longer than high, highest at median third; apex abruptly tapered dorsally, with four small denticles; dorsal sculptured area strigate; short teeth on ventro-apical margin; apex of ventral fold well-developed in a papiliform projection, area along apex totally sculptured with longitudinal striae; ramus basally expanded, extending to apical end.

Valvula II (Figure 2D-F) right and left similar in shape and size, strongly fused each other, expanded basally, tapered apically; approximately 5 times longer than high; highest at apical half; ventral margin of apical half with grooves; dorsal anteapical denticles conical.

Second valvifer (Figure 2G) approximately semi-ovalar, point of articulation dark. Valvula III (Figure 2G-H), in lateral view, approximately twice longer than high, more sclerotic in ventral third; rows of small bristles on apical half, giving an aspect of sandpaper; ventral margin with apex curved dorsally, dorsal margin more rectilinear; apex rounded, forming an apical end small papilla.

Specimen studied – Paratype female: BRAZIL, Amapá [State], Porto [de] Santana, [Santana municipality (0°2'S; 51°10'W)], ICOMI [Indústria e Comércio de Minérios S.A.], February to June 1961, J.C.M. Carvalho leg. (MNRJ).

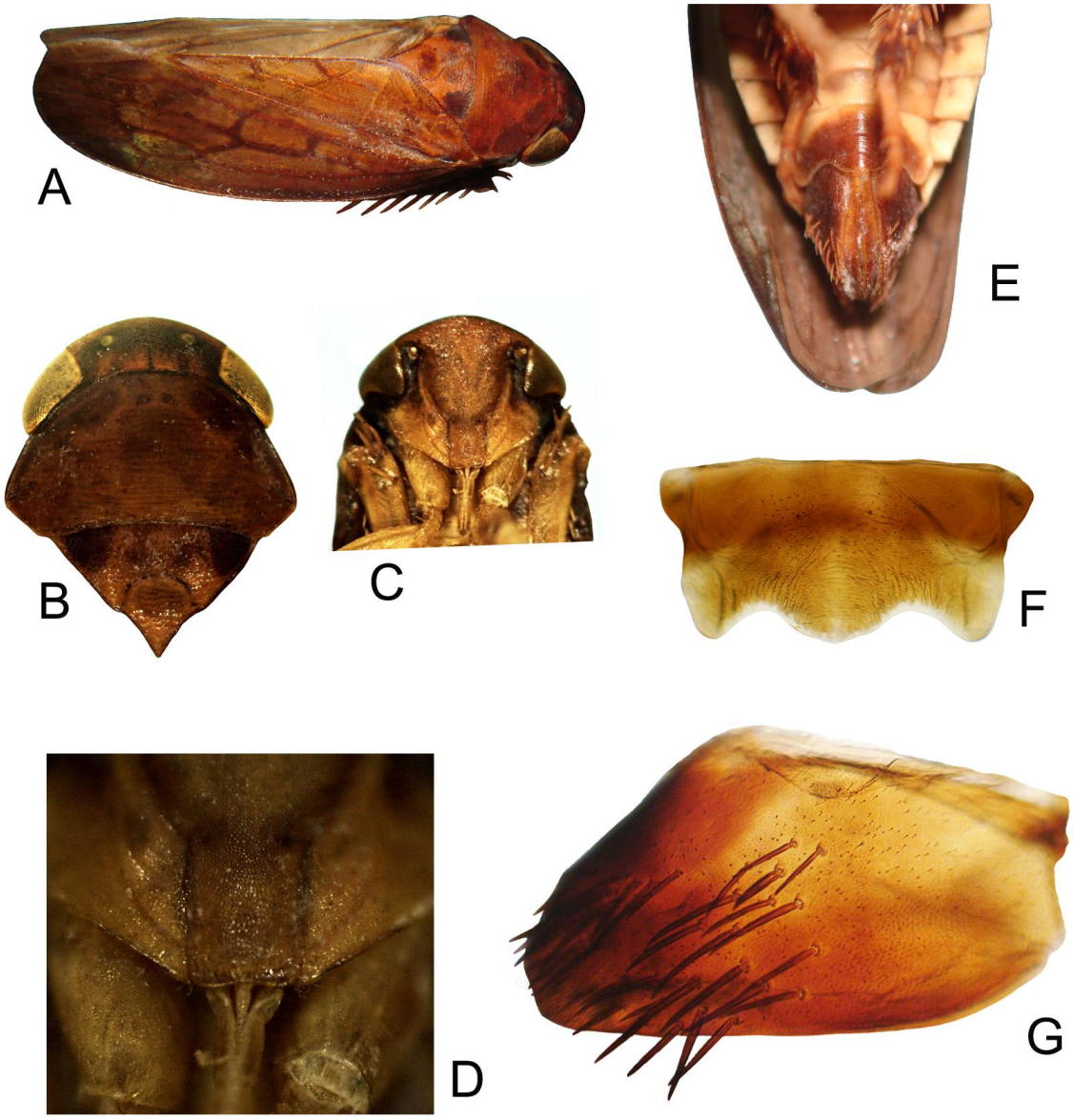

Figure 1. *Polana amapaensis* Coelho, female. **A**, dorso-lateral view; **B**, head and thorax, dorsal; **C**, head, ventral; **D**, detail of clypeus; **E**, last abdominal segments, ventral; **F**, seventh sternite, ventral; **G**, pygofer, lateral.

DISCUSSION

This is the first description of the ovipositor for a *Polana* species, although Hill (1970) has described the valvulae of *P. quadrinotata* (Spangberg) and other Gyponini species in his unpublished thesis. The valvula I of *P. amapaensis* (Figure 2A-C) is similar to *Gyponana octolineata* (Say), which also has a ventral subapical projection, although less pronounced.

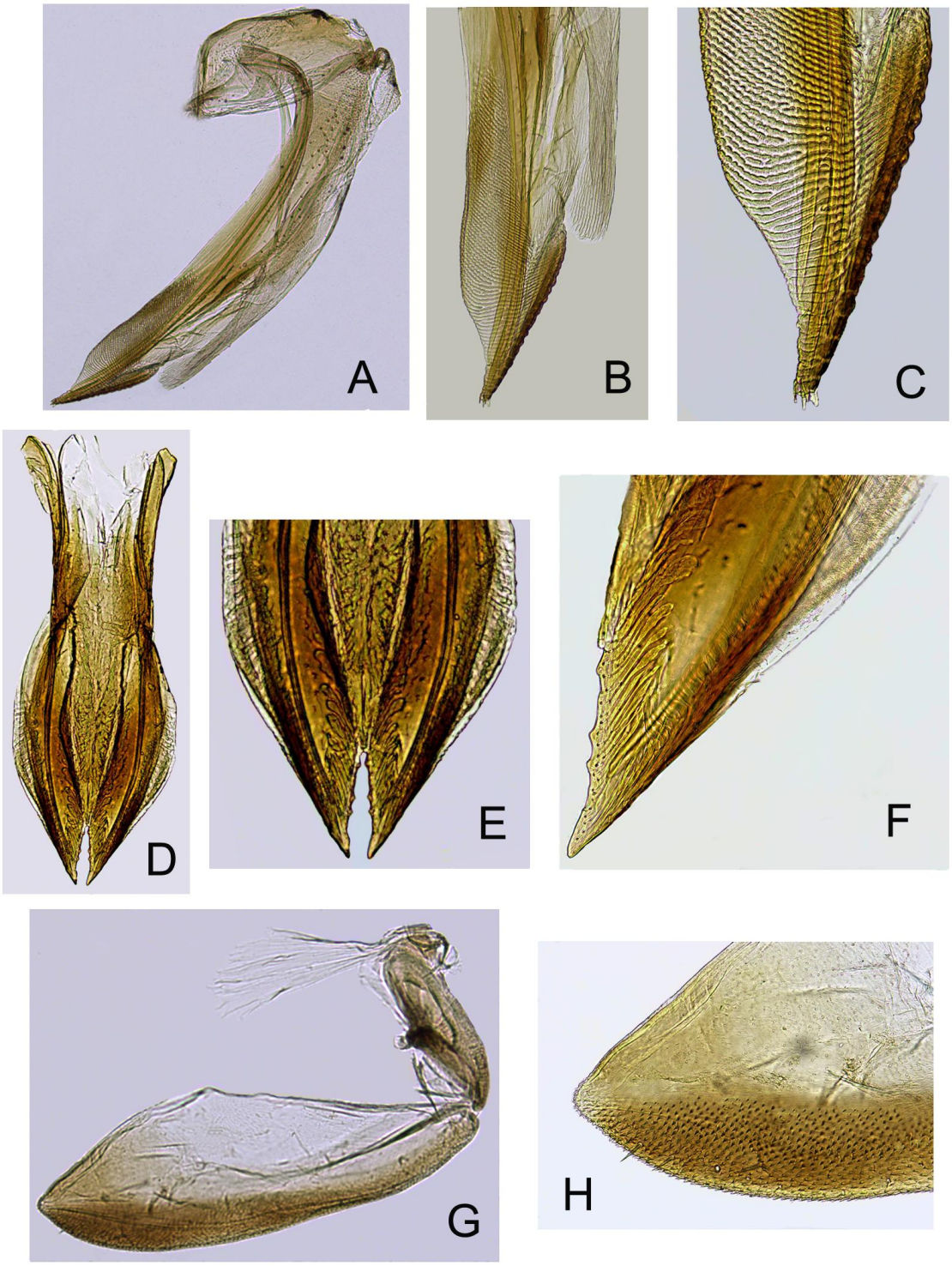

Figure 2. *Polana amapaensis* Coelho, female. **A**, first valvifer and valvula I, lateral; **B**, valvula I, apical half; **C**, valvula I, apex; **D**, valvulae II, dorsal; **E**, valvulae II, apical third; **F**, valvula II, apex; **G**, second valvifer and valvula III; **H**, valvula III, apex.

The apex of valvula II of *P. amapaensis* (Figure 2E-F) is more similar to the *Negosiana dualis* (DeLong), which is also pointed (Hill, 1970). For *P. quadrinotata*, Hill (1970) illustrated only the valvula II. Based on this structure, *P. amapaensis* can be distinguished by having tapered apex (Figure 2D-F), as well as valvula I with dorsal sculptured area somewhat strigate (Figure 2A-C),

and not somewhat vermiform, as in *P. quadrinotata*.

In general shape, valvulae of *Polana amapaensis* are similar to those of *Regalana* DeLong & Freytag, differing by having a subapical ventral papiliform projection on the valvula I (Figs 2A-B). In addition, the subapical teeth on dorsal margin of the valvula II (Fig. 2D-F) is tapered, the valvula III is proportionally higher, and the apical end of the papilla is more pronounced (Fig. 2H). However, as just valvulae of a sole species of *Regalana* (*R. sheilae* Domahovski, Gonçalves, Takiya & Cavichioli) have been described, is not possible to know if these features are useful distinctions to the genus level (Domahovski *et al*., 2014).

Based on the described variations, the female genitalia in tribe Gyponini can be a source of useful taxonomic characteristics. However, according to Engel and Takiya (2012), diagnostic characters in the female genitalia often used in other leafhopper groups was found to vary intraspecifically in genus *Clinonana* Osborn. When more species have such structures described, the knowledge about the taxonomy of *Polana* probably will increase. Besides, we need more collecting throughout the Amazon Basin to obtain additional specimens of *P. amapaensis* and study possible intraspecific variations.

CONCLUSIONS

Female genitalia of *Polana amapaensis* has been studied to update the diagnostic characteristics of the species. Parts of female genitalia, like pygofer, ovipositor valvulae and valvifers, are described in detail. These features will be helpful in identification of this species authentically in future.

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