

Three new species of the Neotropical genus *Hapigia* Guenée from Brazil (Lepidoptera, Notodontidae, Heterocampinae)

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Abstract. Three new species of *Hapigia* Guenée, 1854, from Brazil and Ecuador, are described: *H. postpallida* Becker **sp. nov.**, *H. violacea* Becker, **sp. nov.** and *H. violetta* Becker, **sp. nov.**

Keywords. *Hapigia*; Notodontidae; Taxonomy; Neotropical; New species; Brazil; Ecuador.

INTRODUCTION

Hapigia Guenée, 1852 includes 28 species, distributed from Mexico to Brazil, with one species in Cuba (Becker 2014: 9). Miller *et al.* (1997) discussed the relationship of *Hapigia*, and placed it in their new tribe Hapigiini. In the author's collection there are specimens representing 26 species, 22 collected in Brazil. Three of these species are undescribed, so they are being described here.

MATERIAL AND METHODS

This review is based on examination of the type material deposited in the Smithsonian National Museum of Natural History, Washington, D.C. (USNM), the Natural History Museum, London, United Kingdom (NHMUK) and the Carnegie Museum of Natural History, Pittsburgh (CMNH) and on 295 specimens, 41 genitalia slides (g. s.) in the author's collection (VOB). The holotypes of the new species are provisionally deposited in VOB, and will be transferred, together with the collection, to a Brazilian institution in the future. Some paratypes will be deposited in the USNM. Genitalia were prepared following the methods described by Robinson (1976). Terms for morphological characters follow Hodges (1971).

Abbreviations

FW = Forewing;
g. s. = genitalia slide;
HW = Hind wing.

RESULTS AND DISCUSSION

Examination of the material in the author's collection revealed that three species, from Brazil, are new and are described as follows.

Hapigia violacea Becker, **sp. nov.** (Figs. 1A, B, 3A-D, 4G)

Diagnosis: FW violaceous brown with two small silvery dots close together at end of cell; HW dark fuscous with darker veins.

Description: Male FW length 28-32 mm (62-70 mm wingspan), female 35 mm (76 mm wingspan). Head and thorax dark brown mixed with sparse white scales. Second and 3rd segments of labial palpus with white scales at tip. Thorax dorsally with a fuscous blotch, mixed with white scales, in the middle. Legs with white scales on articulations. Male (Fig. 1A) FW violaceous-red; pale fuscous blotch at base, before basal band, from below cell to dorsum; pair of reddish-ochreous round blotches between basal and antemedial bands, one in, the other below cell; a diffuse snowy area on tornus, from before postmedial band to termen; basal, antemedial, and postmedial bands white: antemedial dentate between veins; postmedial with scales on veins more contrasting, looking a dotted line, edged dark brown distally, slightly curved from distal third of costa to M3, then straight to dorsum before tornus; two silvery dots: one, reniform, at end of cell, the other as two crescent marks, followed by white scales, on costa, before

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Figure 1. *Hapigia* species, adults, dorsal view. (A, B) *H. violacea*, Brazil: (A) Holotype male; (B) Paratype female. (C, D) *H. violetta*: (C) Holotype male, Brazil; (D) Paratype female, Ecuador. (E) *H. curvilinea*, male, Brazil.

apex; subterminal line formed by diffuse, white dots; brown ventrally, with a mark in the cell, an area below, and a band along margin, pale fuscous. HW dorsally dark fuscous, veins contrastingly darker; pale fuscous ventrally. Abdomen dark fuscous dorsally, reddish-brown ventrally, pale towards tip. Female (Fig. 1B) darker and with FW broader than in male; costal silvery dot smaller than the other two.

Male genitalia (Fig. 3A): Uncus short, curved ventrad, compressed laterally; socius slightly shorter than uncus. Valva broad basally, 4× longer than wide, narrowing gradually towards pointed apex. Vinculum with a wide, shallow indentation basally. Phallus (Fig. 3B, C), straight, 4× longer than thick; vesica with pack of deciduous, modified spines.

Female genitalia (Fig. 4G): Similar to those of *H. postpallida* (see below), except for the narrower ostium, antrum and twisted basal end of ductus bursae.

Material examined (9♂♂, 1♀, 3 g. s.): Holotype ♂, BRAZIL: Bahia, Reserva Serra Bonita, 15°23'S, 39°33'W, 800 m, IV-2010 (Becker 145857); Paratypes: 8♂♂, same locality as holotype, II-2007, VII, VIII-2008, III, IV, VI-2009, IX-2011, 01-15-X-2020, g. s. 6003, 6136 (Becker 136974, 140352, 140492, 142373, 143367, 147053, 161022) (VOB); 1♀, Santa Catarina, Brusque, 100 m, 05-I-1989, g. s. 6135 (Becker 60744) (VOB).

Distribution: Brazil, along the Atlantic Forest, from Bahia to Santa Catarina.

Remarks: This and the following species belong to a group of closely similar species, the *H. curvilinea* species-group. They can be readily distinguished from each other by the silver dots at the end of FW cell. In *H. curvilinea* Schaus, 1904 (Fig. 1E), there are three large dots disposed in an arch. In *H. violacea* (Figs. 1A, B) there are two small dots closely connected, usually forming a single dot, in some specimens there is a third, minute dot above them. In

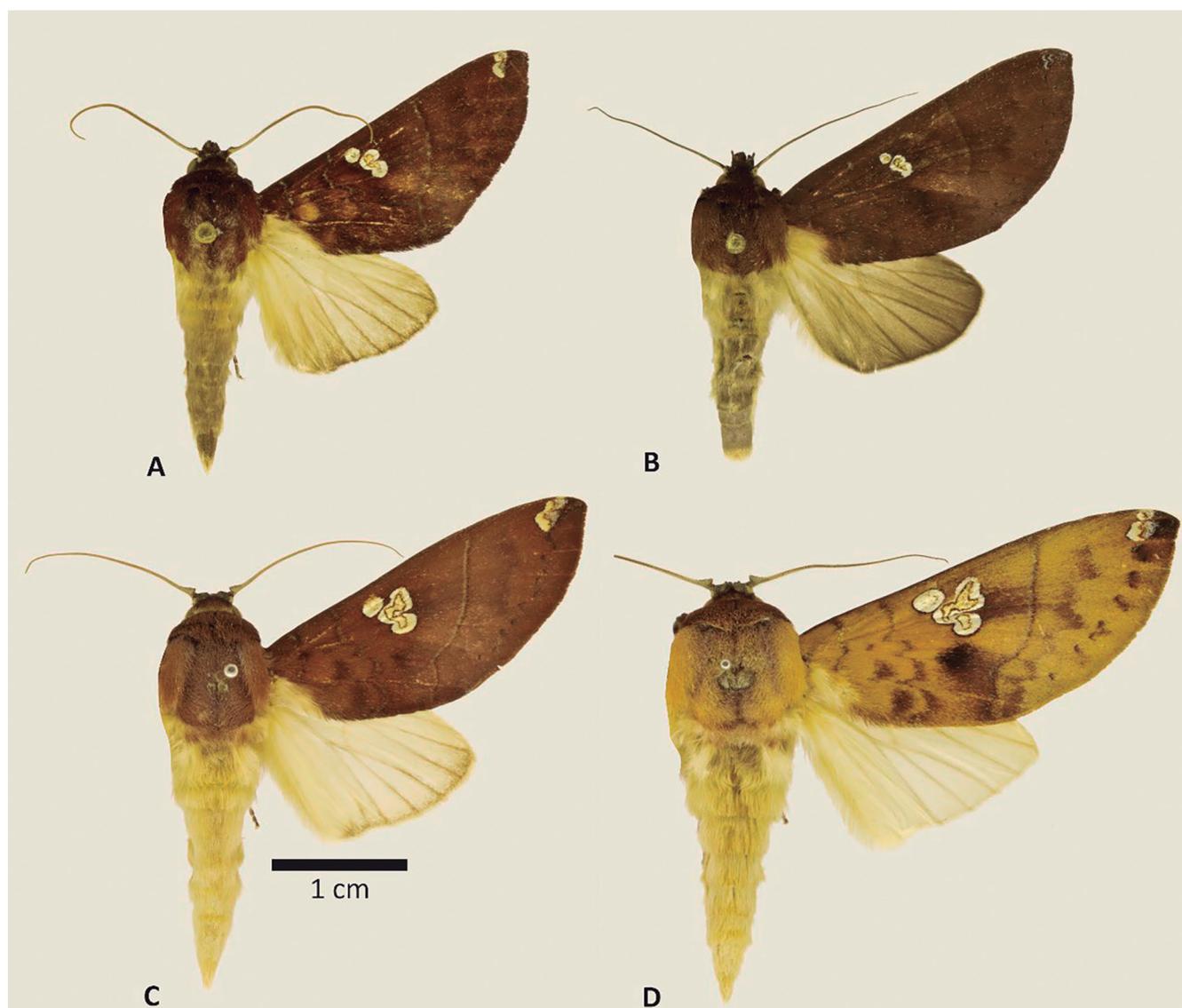


Figure 2. *Hapigia* species, adults, Brazil, dorsal view. (A, B) *H. postpallida*: (A) Holotype male. (B) Paratype female. (C, D) *H. plateada*, males, Brazil: (C) Red form. (D) Ocher form [= *H. dorema*].

H. violetta (Figs. 1C, D) the three dots are nearly the same size, disposed in an oblique, straight line. There are also differences in their genitalia, as explained under each species. In *H. violacea* (Fig. 3A) the valva is the most acute of them. As the phallus of *Hapigia* species bear deciduous, thorny spines, the vesica was not everted (Fig. 3C) to prevent them being scattered around. These spines are transferred to the female bursa copulatrix during copulation, so missing in males which had mated before collecting (Fig. 3B), and found inside the bursa copulatrix of females.

***Hapigia violetta* Becker, sp. nov.**
(Figs. 1C, D, 3E-G, 4H)

Diagnosis: FW violaceous brown with the three silvery dots disposed on an oblique, straight line; HW fuscous with darker veins.

Description: Male FW length 28-30 mm (62-66 mm wingspan), female 40 mm (87 mm wingspan). Male (Fig. 1C) FW violaceous-red; pale fuscous blotch at base,



Figure 3. *Hapigia* species, Brazil, male genitalia and 8th abdominal segments, ventral view, except for phallus, lateral view. (A-D) *H. violacea*, paratype: (A) genitalia, paratype, Brazil; (B, C) phallus; (D) 8th abdominal segment. (E-G) *H. violetta*, holotype: (E) genitalia; (F) phallus; (H) 8th abdominal segment. (I-K) *H. curvilinea*: (I) genitalia; (J) phallus; (K) 8th abdominal segment.

before basal band, from below cell to dorsum; pair of reddish-ochreous round blotches between basal and antemedial bands, one in, the other below cell; a triangular, diffuse slightly pale area on tornus, with basal angle from lower end of cell, extending to termen above tornus; basal, antemedial, and postmedial bands whitish,

edged dark brown outside: antemedial dentate between veins; postmedial with scales on veins more contrasting, forming a dotted line, slightly curved from distal third of costa to M3, then straight to dorsum before tornus; three silvery dots of near same size, disposed on an oblique straight line at distal end of cell; subterminal line

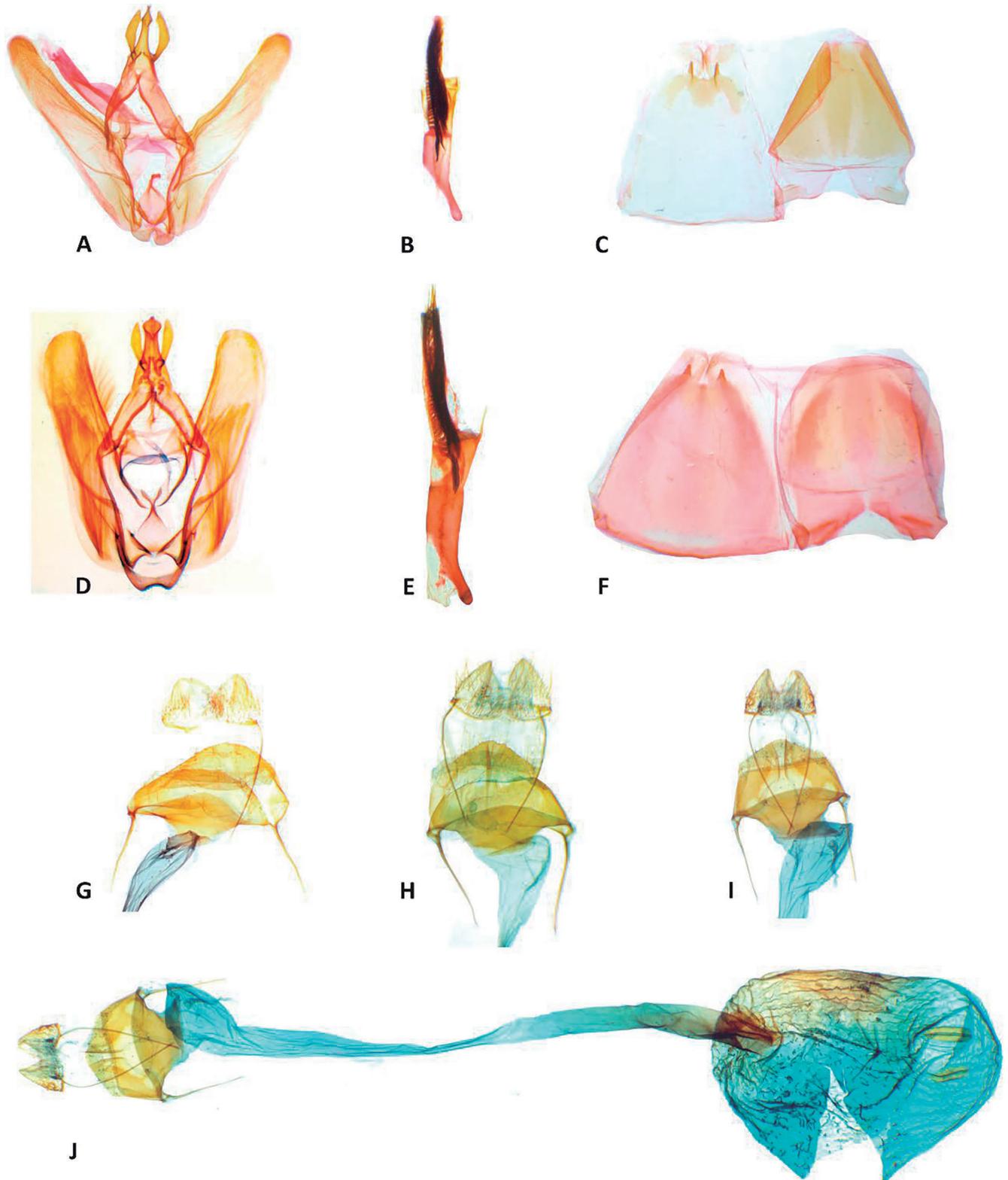


Figure 4. *Hapigia* species, genitalia and 8th abdominal segments, ventral view, except for phallus, lateral view, (A-I) male, (J-M) female. (A-C) *H. postpallida*, paratype, Brazil: (A) genitalia; (B) phallus; (C) 8th abdominal segment. (D-F) *H. plateada*, Brazil (G-J) female genitalia, paratypes, ventral view; (G-I) details of ostium area. (G) *H. violacea*, Brazil: (H) *H. violetta*, Ecuador. (I-J) *H. postpallida*, Brazil.

formed by diffuse, white dots; brown ventrally, with a mark in the cell, an area below, and a band along margin, pale fuscous. HW dorsally dark fuscous, veins contrastingly darker; pale fuscous ventrally. Abdomen dark fuscous dorsally, reddish-brown ventrally, except pale towards tip. Female (Fig. 1D) darker and with FW broader than in male.

Male genitalia (Fig. 3E): Uncus bent ventrally, slightly narrower along middle, slightly expanded towards short, thin, laterally compressed apex. Socii almost as long as uncus, bent dorsally, slightly thickened along middle. Valva longer than uncus, broad basally, narrowing gradually towards round apex; costa straight, ventral margin round basally, straight to apex. Juxta a shield plate with a long, thin process posteriorly. Vinculum strongly indented medially. Phallus (Fig. 3F) straight, strongly reduced at basal fourth; vesica with a scobinate area laterally.

Female genitalia (Fig. 4H): Very similar to those of *H. postpallida* (see below), but antrum much shorter than wide.

Material studied (2♂♂, 1♀ 3 g. s.): Holotype ♂, BRAZIL: 1♂, Rondônia, Cacaupônia, Fazenda Rancho Grande, 140 m, 15-20-IV-1996, g. s. 6134 (Becker 107287) (VOB); Paratypes: 1♂, same locality as holotype, 13-31-XII-1997, g. s. 4978, (Becker 112023); ECUADOR: 1♀, Napo, Misahualli, 450 m, XII-1992, g. s. 6137 (Becker 100960) (VOB).

Distribution: Brazil and Ecuador, in West Amazons.

Etymology: From the Latin *viola* = violet; a noun in the nominative, feminine, in apposition.

Remarks: Similar to *H. curvilinea* (Fig. 1E) and *H. violacea* (Figs. 1A, B), but easily distinguished by the silver dots on FW, as explained under. In *H. violetta* the three dots are nearly the same size and disposed as an oblique, straight line. The valva (Fig. 3E) is broader than that of *H. violacea* (Fig. 3A), but narrower than that of *H. curvilinea* (Fig. 3I).

***Hapigia postpallida* Becker, sp. nov.**
(Figs. 2A, B, 4A-C, I-J)

Diagnosis: FW reddish-brown, with three silvery dots disposed in an oblique line at end of cell, HW pale yellow tinged fuscous towards margins.

Description: Male FW length 23-25 mm (50-56 mm wingspan), female 28 mm (62 mm wingspan). Head and thorax dark brown. Second and 3rd segments of labial palpus mixed with white scales at tip. Thorax dorsally with pair of blotches with white scales in the middle; reddish-brown ventrally; legs with white scales on articulations. Male (Fig. 2A) FW dorsally reddish-brown, shaded dark-brown; basal, antemedial and postmedial bands dark-brown, with scattered white scales: basal and

antemedial indented between veins, postmedial evenly curved from distal third of costa to Cu₂, then perpendicular to dorsum before tornus; three round silvery dots, with red and white scales in the middle, at end of cell, disposed in an arch: costal one smaller; pair of silvery dots, followed by white scales distally, before apex, between costa and R₃; whitish patch from base to basal band, below cell to dorsum; pale fuscous ventrally. HW whitish, veins dark fuscous towards margin. Abdomen fuscous dorsally, red brown ventrally, pale fuscous at tip. Female (Fig. 2B), darker than male, with HW fuscous.

Male genitalia (Fig. 4A): Uncus short, thin, constricted along middle, slightly thickened before minute apex; socii as long as uncus, curved dorsad, slightly thickened along middle. Valva long and narrow, 6× as long as wide, narrowing gradually towards round apex. Vinculum round, with a small indentation at middle. Juxta a vertical, oblong plate, round basally, expanded as a thin digit distally. Phallus (Fig. 4B), 5× longer than thick, slightly curved ventrad at basal third; vesica with a pack of deciduous, thin, modified spines.

Female genitalia (Figs. 4I, J): As long as abdomen. Apophysis very thin, posterioris twice as long as anterioris. Ostium bursae as wide as lamella antevaginalis, margin evenly round; antrum sclerotized, wider than long, narrowing gradually towards ductus bursae; ductus bursae twice as long as bursa diameter, broader than antrum, twisted basally, then thin, slightly sclerotized towards bursa; corpus bursae globular, wrinkled longitudinally; pair of signa, each one a pair of elongate bar.

Material examined (11♂♂, 1♀, 2 g. s.): Holotype ♂, BRAZIL: Bahia, Reserva Serra Bonita, 15°23'S, 39°33'W, 600 m, 15-XI-1995 (Becker 106038); Paratypes: 1♀, same locality as holotype, 800 m, Reserva Serra Bonita, 15°23'S, 39°33'W, 800 m, IV-2021, g. s. 6139 (Becker 163249); 4♂♂, Santa Catarina, Lauro Müller, -28,32, -49,51, 475 m, 17-18.III.2023 (Becker 167848); 1 ♂, São Paulo, Jundiá, Japi, 23°13'S, 46°56'W, 900 m, 13-16-II-2001 (Becker 131783); 1♂, São Paulo, São José do Barreiro, -22,72, -44,61, 1,640 m, X-2021, g. s. 6138 (Becker 164584); 2♂♂, São Paulo, São Luis do Paraitinga, 22°00'S, 39°03'W, 700 m, 26-X-2019 (Becker 160767) (VOB); 1♂, São Paulo, Guaratinguetá, Santa Maria da Serra, -22,71, -45,43, 1,900 m, 25-27.III.2023 (Becker 168021) (VOB).

Distribution: Brazil, along the Atlantic Forest, from Bahia to Santa Catarina.

Remarks: One of the smallest species in the genus. The only other species of *Hapigia* with whitish HW are *H. plateada* Schaus, 1904 (Figs. 2C, D) and *H. curvilinea* Schaus (Fig. 1E). The former has HW wholly whitish-cream, and FW has four silver dots at distal end of cell, forming a large, irregular triangle. The second has HW pale yellow, with veins fuscous towards margins, as in *H. postpallida* but the silver dots at end of FW cell are disposed in an arch. In *H. postpallida* the three dots are form

an oblique straight line, and the valva is narrow, not as wide as in the other two (Figs. 3I, 4A). The FW of *H. plateada* varies from dark reddish-brown (Fig. 2C), to ochre yellow (Fig. 2D). The reddish color form was described as *H. plateada*, the ochre yellow form as *H. dorema* Schaus, 1921 (synonymized by Becker, 2014: 9).

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