

A review of the Neotropical Apatelodidae genus *Prothysana* Walker, 1855 (Lepidoptera: Bombycoidea)

Vitor O. Becker & Elton Orlandin

Abstract

Three species of *Prothysana* Walker, 1855, are recognized, one of them, from Brazil, described as new: *P. felderi* (Druce, 1887); *P. magna* Becker & Orlandin, sp. nov., and *P. terminalis* Walker, 1855. Diagnosis, key, and illustrations of both the adults and the genitalia are presented to enable their recognition.

Keywords: Lepidoptera, Bombycoidea, Apatelodinae, *Prothysana*, new species, distribution, Neotropical.

Revisión del género Neotropical de Apatelodidae *Prothysana* Walker, 1855 (Lepidoptera: Bombycoidea)

Resumen

Se reconocen tres especies de *Prothysana* Walker, 1855, una de ellas, de Brasil, descrita como nueva: *P. felderi* (Druce, 1887), *P. magna* Becker & Orlandin, sp. nov. y *P. terminalis* Walker, 1855. Se presentan diagnóstico, clave e imágenes de los adultos y genitalia para permitir su identificación.

Palabras clave: Lepidoptera, Bombycoidea, Apatelodidae, *Prothysana*, especie nueva, distribución, Neotropical.

Revisão do gênero Neotropical Apatelodidae *Prothysana* Walker, 1855 (Lepidoptera: Bombycoidea)

Resumo

Três espécies de *Prothysana* Walker, 1855 são reconhecidas, uma delas, do Brasil, descrita como nova: *P. felderi* (Druce, 1887); *P. magna* Becker & Orlandin, sp. nov. e *P. terminalis* Walker, 1855. Diagnose, chave e ilustração de ambos adultos e genitália são apresentados para permitir seu reconhecimento.

Palavras-chave: Lepidoptera, Apatelodidae, *Prothysana*, espécie nova, distribuição, Neotropical.

Introduction

Prothysana Walker, 1855, described, as a monotypic genus, in the Drepanulidae [Drepanidae], included two species (Draudt, 1929; Becker, 2001). It was transferred to the Bombycidae by Kirby (1892, p. 932) and to the Apatelodidae by Fletcher & Nye (1982, p. 133). Examination of the material in the Brazilian collections revealed that the genus includes three species, one of them, from Brazil, undescribed. The genus is here reviewed for the first time. Diagnosis, illustrations of both the adult and genitalia, as well as a key to species, are provided to enable their identifications.

Material and methods

This work is based on 19 specimens deposited in the first author (VOB), three in the Diego R. Dolibaina (DDC), on 19 specimens in the University Federal of Paraná (UFPR), and 108 specimens in the (USNM) collections, as well as on the pertinent literature. A synoptic collection was taken by the first author to the NHMUK and to USNM and compared with material deposited there. Genitalia dissections follow Robinson (1976) and terms for morphological characters, Hodges (1971). The type-material will provisionally be deposited in the first author's collection and will be transferred, along with the rest of the collection, to a Brazilian institution.

Abbreviations

ACG = Área de Conservación Guanacaste, Costa Rica.
 AL = Alagoas State, Brazil.
 BA = Bahia State, Brazil.
 DDC = Diego R. Dolibaina Collection.
 ES = Espírito Santo State, Brazil.
 FW = Forewing.
 HW = Hind wing.
 MG = Minas Gerais State, Brazil.
 NHMUK = Natural History Museum, London, United Kingdom.
 PR = Paraná State, Brazil.
 RJ = Rio de Janeiro State, Brazil.
 SC = Santa Catarina State, Brazil.
 SP = São Paulo State, Brazil.
 UFPR = Universidade Federal do Paraná.
 USNM = Smithsonian National Museum of Natural History, Washington, DC, USA.
 VOB = Vitor O. Becker collection, Serra Bonita Reserve, Camacan, Bahia, Brazil.

Results and discussions

Prothysana Walker, 1855

Prothysana Walker, 1855. *List specimens lepid. Insects Colln Br. Mus.*, 5, 1175

TS: *P. terminalis* Walker, 1855. *List specimens lepid. Insects Colln Br. Mus.*, 5, 1175, by monotypy
 = *Compsa* Walker, 1862. *Trans. Ent. Soc. Lond.*, (3) 1, 254

TS: *C. saturata* Walker, 1862. *Trans. Ent. Soc. Lond.*, (3) 1, 254, by monotypy. Junior homonym of *Compsa* Perty, 1832, in Spix, *Delectus animalia articulorum Bras.* (2), 92 (Coleoptera). [Synonymized by Becker, 2001, p. 156].

= *Mesotages* Felder, 1874. *Reise ost. Fregatte Novara (Zool.)*, 2(Abt. 2), pl. 95

TS: *Mimallio trilunula* Herrich-Schäffer, [1856]. *Samm. neuer oder wenig bekannter aussereur. Schmett.*, 1(1), pl. 81, fig. 485, by monotypy. Junior homonym of *Mesotages* Foerster, 1862, *Verh. natur. Ver. preuss. Rheinl.*, 19, 258 (Hymenoptera). [Synonymized by Becker, 2001, p. 156].

= *Tarchon* Druce, 1887. *Biol. Cent.-am. (Zool.) Lepid. Heterocera*, 1, 222.

TS: *Mimallio trilunula* Herrich-Schäffer, [1856], *Samm. neuer oder wenig bekannter aussereur. Schmett.*, 1(1), pl. 81, fig. 485, by monotypy.). [Synonymized by Becker, 2001, p. 156].

= *Zolessia* Biezanko & Monné, 1968, *Revta. soc. Urug. Ent.*, 7, 101, repl. n.

TS: *Compsa saturata* Walker, 1862. *Trans. Ent. Soc. Lond.*, (3) 1, 254, by monotypy. [Synonymized by Becker, 2001, p. 156].

Diagnosis: Medium size (FW length 15 to 25 mm; 34-55 mm wingspan). Dark reddish brown or light reddish brown. Antenna long ciliated in males, shorter ciliated in females, approximately 1/3 the length of the costal margin of the FW in males, 1/4 in females. Labial palpus upcurved, covered by large scales, reaching 1/2 of eye height, 2nd segment twice as long as the 1st, 3rd absent. Proboscis absent. FW basal and apical area

light brown. HW ventrally lighter than dorsally, with a pronounced discal spot. FW and HW venation as illustrated by Lima (1950, p. 280). Abdomen slender in males, more robust in females. Male genitalia: Uncus simple, flat at the tip with slightly concave apex, socii absent, gnathos fused. Aedeagus curved. Vesica with numerous small cornuti.

Distribution: From Southern Mexico to Southern Brazil, absent in the Antilles.

Remarks: In Apateلودidae, *Prothysana* is the only genus in which the known immatures build cocoons and do not pupate underground.

Key to species

1. Mexico, Central America, Andes (Venezuela to Peru) *felderi*
Brazil 2
2. FW length <17 mm *terminalis*
FW length >20 mm *magna*

Prothysana terminalis Walker, 1855 (Figures 1-5, 12-14, 19-21)

Prothysana terminalis Walker, 1855. *List specimens lepid. Insects Colln Br. Mus.*, 5, 1175

Holotype ♂, [BRAZIL]: Rio de Janeiro (ex Fry col.) [presumably lost].

= *Mimallo trilunula* Herrich-Schäffer, [1856], *Samm. neuer oder venig bekannter aussereur. Schmett.*, 1(1), pl. 81, fig. 485.

Type ♂, BRAZIL: [RJ, Rio de Janeiro] [plate examined]. [Synonymized by Becker, 2001, p. 156].

= *Compsa saturata* Walker, 1862. *Trans. Ent. Soc. Lond.*, (3)1, 254.

Holotype ♂, [BRAZIL: RJ], Rio de Janeiro (ex Fry col.) [image examined]. [Synonymized by Becker, 2001, p. 156].

Material examined (37 ♂, 4 ♀, 3 g. s.): BRAZIL: AL, 2 ♂, Maceió, 26-IX-1949, 21-VII-1973 (Cardoso) (UFPR 45512, 52970); BA, 2 ♂, Camacã, Reserva Serra Bonita, 15°23'S - 39°33'W, 800 m, VIII-2009, 3-VIII-2018 (Becker 144423, 157029) (VOB); ES, 3 ♂ [no further data] (Johnson) (USNM); 7 ♂, Linhares, Reserva Florestal Vale do Rio Doce, 40 m, 4, 1-IV-1987, 5-9-IV-1992, g. s. 1773, 2694; 25-30-I-1998 (Santos) (VOB 74489), (Becker 82008, 113456) (VOB, USNM); 1 ♂, Marechal Floriano, 2 km E Araguaia, 20°29'56.77"S - 40°45'36.84"W, 800 m, 21-24-VII-2020 (Dolibaina) (DDC 718); MG, 1 ♂, Caldas, 9-2-[19]07, (Arp) (USNM); 1 ♂, Caraça, 1300 m, 10-V-1996 (Becker 107898) (VOB); 2 ♂, Espera Feliz, Sítio Sereno, 20°31'27.78"S - 41°51'3.93"W, 1200 m, 11-14-I-2021 (Dolibaina) (DD 719, DD 720); 1 ♂, São Roque de Minas, Pousada Dois Irmãos, 20°18'38.99"S - 46°32'9.58"W, 870 m, 6-8-II-2020 (Vasconcellos) (UFPR 52. 816); PR, 1 ♀, Castro (USNM); 1 ♂, Cornélio Procópio, Pq. Est. Mata São Francisco, 23°08'59"S - 50°34'19"W, 3-5-V-2016, (Santos, Silva ♀ Queiroz Santos) (UFPR 45508); RJ, 1 ♂ (Zikan) (USNM); 1 ♂, Angra [dos Reis], Jussara, 22-II-1936, (Almeida, Oiticica ♀ Costa) (UFPR 45608), 1 ♂, Cachoeiras de Macacu, Valério, 25-IX-2012 (Tangerini) (UFPR 52971), 1 ♂, Mangaratiba, 150 m, 20-I-1993 (Becker 85413) (VOB); 1 ♂, Sahy, Ramal de Mangaratiba, 27-VIII-1932 (Almeida) (UFPR 52965); 1 ♂ Paineiras, 12-II-1956 (Gagarin) (UFPR 45470); 6 ♂, Petrópolis, 5-IX-1959, 23-IX-1959, 19-10-1959, 18-VI-1960, 13-VIII-1963 (Gagarin) (UFPR 45551, 45600, 45622, 51538, 52967, 52969); 1 ♂, Petrópolis, Independência, 900 m, 20-III-1939, Gagarin (UFP 52966); 1 ♂, Teresópolis, Barreira, 11-XI-1955 (Gagarin) (UFPR 52968); SC, 2 ♂ [no further data] (Johnson) (USNM); 1 ♀, Joaçaba, Nova Petrópolis, 27°06'08.3"S - 51°36'25.2"W, 780 m, 16-III-2022 (Orlandin ♀ Piovesan), ex larvae (UPR 54349); SP, 1 ♂, Capão Bonito, Intervalles, 24°16'S - 48°24'W, 900 m, 5-7-XII-2001, g. s. 6010 (Becker 134145), 1 ♀, Termas de Lindoia, 2-II-1950, g. s. 45588 (Almeida) (UFPR 45588), 1 ♀, Umuarama, 1800 m, 8-15-IV-1937 (Gagarin) (UFPR 45592); 1 ♂, São Luis do Paraitinga, 23°20'S - 45°06'W, 900 m, 12-17-XI-2001 (Becker 133835) (VOB).

Diagnosis: Male (Figures 2-3) FW length 15-17 mm (32-35 mm wingspan). Dark reddish-brown, FW apical area with three ochreous lunular dots. Similar to *P. magna* sp. n. but smaller and with basal and apical areas lighter.

Description: FW dorsally dark reddish brown, basal area light brown, post discal area, from costal to dorsum with a blurry band; apical area with three ochreous lunular spots on R_4-M_2 ; ventrally dark reddish

brown, anal area light brown, apical area with a light brown semicircular spot from R_4 - M_3 . HW dorsally dark reddish brown, ventrally light brown, postdiscal area dark reddish brown. Abdomen dorsally dark reddish brown, ventrally light brown with 6 or 7 pairs of dark reddish-brown spots. Female (Figures 4-5) FW length 17-22 mm (40-44 mm wingspan) wings lighter than male.

Male genitalia (Figures 12-13): Valva 2,5 times as long as wide, margins curved, apex round; sacculus more sclerotized than the valva, rectangular, 1/3 of the valva length.

Female genitalia (Figure 14): Eighth tergum a rectangular plate; lamella antevaginalis less sclerotized than tergum; lamella postvaginalis weakly sclerotized; anterior apophysis about the same length as posterior apophysis both as long as ductus bursae; ostium bursae and antrum weakly sclerotized; ductus bursae membranous, short, of the same length as of corpus bursae; corpus bursae ovoid, membranous, signum small, somewhat rounded bearing inward-pointing spines; ductus seminalis membranous, located near the antrum; papillae analis elongated dorsoventrally.

Immature stages (Figures 19-21): A caterpillar of the penultimate instar was collected and reared by the second author. The body is slightly flattened dorsoventrally, covered with long and short straw-yellow setae. The dorsal region is covered by straw-yellow spatulate setae, except on A1 and A2 where these setae are black. In the last larval instar, the larva builds the cocoon by joining the setae of its own body with silk and attaching the cocoon to the host plant. Pupa brown, smooth, without ornamentation and cremaster.

Host-plant: *Saccharum villosum* Steud. and others Poaceae not identified.

Distribution (Figure 1): Brazil, eastern, from Alagoas to Santa Catarina.

Remarks: In the USNM series there is one female bearing a label in Schaus' handwriting: "Comp. type Oxf.". It was not possible to examine the type-material of *M. trilumula*, however the original illustration leaves no doubt about its identity. Males come ready to light.

Prothysana felderi (Druce, 1887) (Figures 1, 6-9, 15, 16)

Tarchon felderi Druce, 1887. *Biol. Cent.-am. (Zool.) Lepid. Heterocera*, 1, 222

Holotype ♂, PANAMA: Volcán de Chiriqui (NHMUK) [image examined].

Material examined (Type, 37 ♂, 71 ♀, 1 g. s.): ECUADOR: 1 ♀, Cañar, 20 km SE La Troncal, 2200ft [670 m], VII-1984 (Weller & Jacobson) (USNM). GUATEMALA: 1 ♂, B.[aja] Ver.[apaz], Purulha, 1620 m, 1-4-IX-1999, g. s. 6011 (Becker 123087 (VOB); 2 ♂ [Verapaz], Purulha, VII (Schaus and Barnes) (USNM); 1 ♀, [Izabal], Cayuga, V (Schaus and Barnes) (USNM); 1 ♂, COSTA RICA: Cartago, Turrialba, 600 m, 20-XII-1971 (Becker 21416); 1 ♂, Puntarenas, Monte Verde, 1500 m, 1-4-IX-1999 (Becker 119277); 30 ♂ 62 ♀, Guanacaste/Alajuela, Área de Conservación Guanacaste (Janzen ♀ Hallwach). MEXICO: [Veracruz], 1 ♀ Jalapa (Schaus) (USNM); 2 ♂, 1 ♀ Misantla, VII, X, XI-[19]11 (Gugelmam, R Muller) (USNM); 1 ♀, Jalapa (USNM). PANAMA: 1 ♀, cocoon, pupal skin, Pipeline rd, near Gamboa, 4-I-1990, ex larva on *Flemingia strobilifera* (L.) W. T. Aiton (Fabaceae) (A. Aiello) (VOB), 1 ♀, Lino, 800 m (Fassl) (USNM); PERU: Loreto, Explorama Inn, 40 Km NE Iquitos on Amazon Riv., 24-VI-20-VII-1990 (Menke ♀ Awertschenko) (USNM). VENEZUELA: 2 ♀, Aragua, 1100 m, 8-14-VIII-1967, 22-23-I-1978 (Heppner, Poole) (USNM).

Diagnosis: Male (Figures 6, 7) FW length 18-21 mm (40-45 mm wingspan). Similar to *P. terminalis*, but with a contrasting dot at the end of discal cell and with white dots on postdiscal area near inner margin.

Description: Male dorsally dark reddish brown; a contrasting dot at the end of discal cell; postdiscal area, near the inner margin with white dots; outer margin pale brown; ventrally paler and without white dots. HW dorsally dark reddish brown; underside paler. Female (Figures 8-9) FW length 26 mm (56 mm wingspan). Wings light reddish brown; FW postdiscal area with white spots more pronounced.

Male genitalia (Figures 15-16): As in *P. terminalis*, but valva with reduced sacculus and aedeagus more robust and less curved.

Immature stages: In ACG (Janzen & Hallwachs, 2009) there are images of several immatures of *P. felderi*. The caterpillar of *P. felderi* is similar to the *P. terminalis* caterpillar but with two variants of coloration. Apparently, the male of *P. felderi* shows similar color to the immature of *P. terminalis*, while the female is covered with long and short red setae with white and black spatulate dorsal setae.

Hostplant: In ACG (Janzen & Hallwachs, 2009) there are records for numerous host plants families: ferns (Dennstaedtiaceae), monocots (e. g. Araceae, Heliconiaceae, Musaceae), and dicots (e. g. Asteraceae, Euphorbiaceae, Fabaceae, Lauraceae, Malvaceae, Myrtaceae Rubiaceae, Solanaceae, Urticaceae).

Distribution (Figure 1): Mexico through Central America, along the Andes, from Venezuela to Peru.

Remarks: What draws attention is the range of host plant strains that can be used by this species. In other known species of Apatelodidae, feeding is restricted to a few families of host plants, all of which are dicots. At Bold Systems platform, there is a series of about 100 specimens of *P. felderi* with sequenced COI, all from ACG. This series forms two clusters with a distance greater than 2% between them. Studies should be carried out in order to elucidate whether *P. felderi* forms a complex of cryptic species or whether this result is just an intraspecific variation.

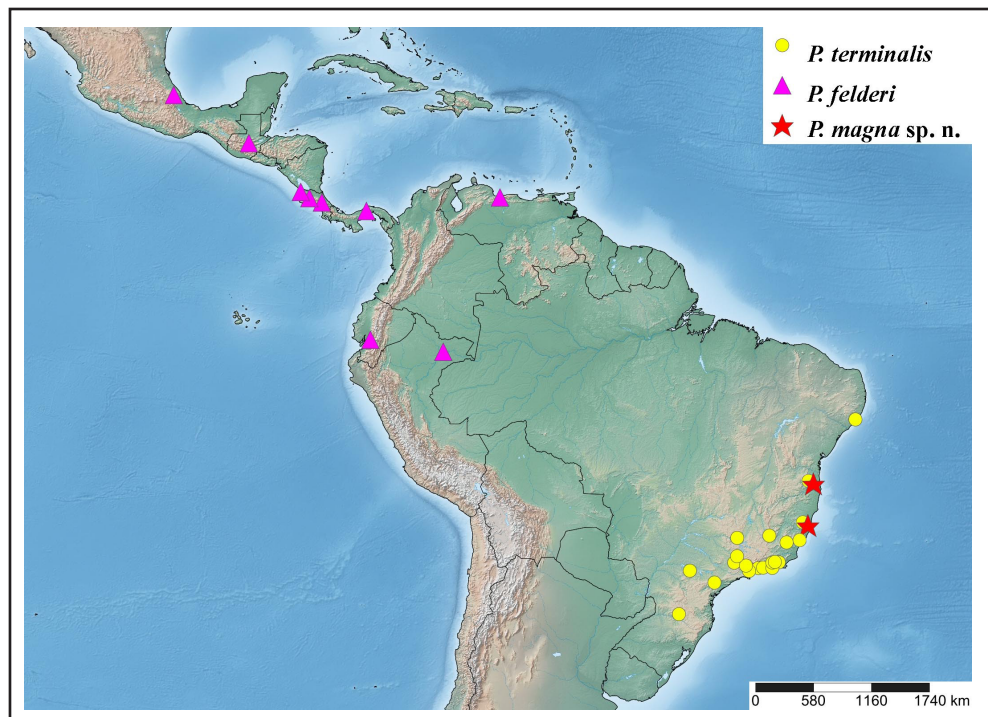
***Prothysana magna* Becker & Orlandin, sp. nov.** (Figures 1, 10-11, 17-18)

<https://zoobank.org/132A99C3-FB51-4989-BA93-D508B36C4096>

Holotype ♂, BRAZIL: BA, Camacã, Reserva Serra Bonita, 15°23'S - 39°33'W, 800 m, IV-2012 (Becker 149596) (VOB). Paratypes: 2 ♂, same locality as holotype, IV-2019, V-2021, g. s. 6012 (Becker 158587, 163691) (VOB); 1 ♂, ES, Linhares, Reserva Florestal Vale do Rio Doce, 28-IV-1989, g. s. 6013 (J. Santos) (VOB 74488).

Diagnosis: Male (Figures 10, 11) FW length 20-25 mm (45-54 mm wingspan). Similar to *P. terminalis* but larger and with basal and apical areas darker. Male genitalia similar to those of *P. terminalis* but larger; sacculus larger and rounded, almost reaching the dorsal region of the valva.

Figure 1. *Prothysana*, distribution. Mexico through Central America, along the Andes, from Venezuela to Peru, south to Southeastern Brazil.



Description: Head, dark reddish brown. Antenna long ciliated, approximately 1/3 the length of the costal margin of the FW. FW dorsally dark reddish brown, basal area light brown, postdiscal area, from costa to inner margin with a blurry band; apical area with three light brown lunular dots on R_4-M_2 ; ventrally dark reddish brown, anal area light brown, apical area with a light brown semicircular dot from R_4-M_3 . HW dorsally dark reddish brown, ventrally light brown, postdiscal area dark reddish brown. Abdomen dorsally dark reddish brown, ventrally light brown with 6 or 7 pairs of dark reddish-brown dots. Female unknown.

Male genitalia (Figures 17-18): Uncus simple, flat at the tip with slightly concave apex, socii absent, gnathos fused; valva long, like a tongue; sacculus more sclerotized than the valva, rounded, almost reaching the dorsal region of the valva. Aedeagus curved. Vesica with numerous small cornuti.

Immature stages and hostplant: Unknown.

Distribution (Figure 1): Brazil, Southeastern.

Etymology: From the Latin *magnus*, *-a*, *-um* = large, great; feminine.

Remarks: The largest species in the genus. The male from Espírito Santo is lighter, reddish brown, not as dark as the specimens from Bahia, however, their genitalia are identical. It is a crepuscular species. No specimens ever came to the sheet, arriving to the windows just when it was getting dark, never resting, banging against the glass.

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Conflict of Interest

The authors declare that there is no known financial interest or personal relationship that could have influenced the work presented in this article.

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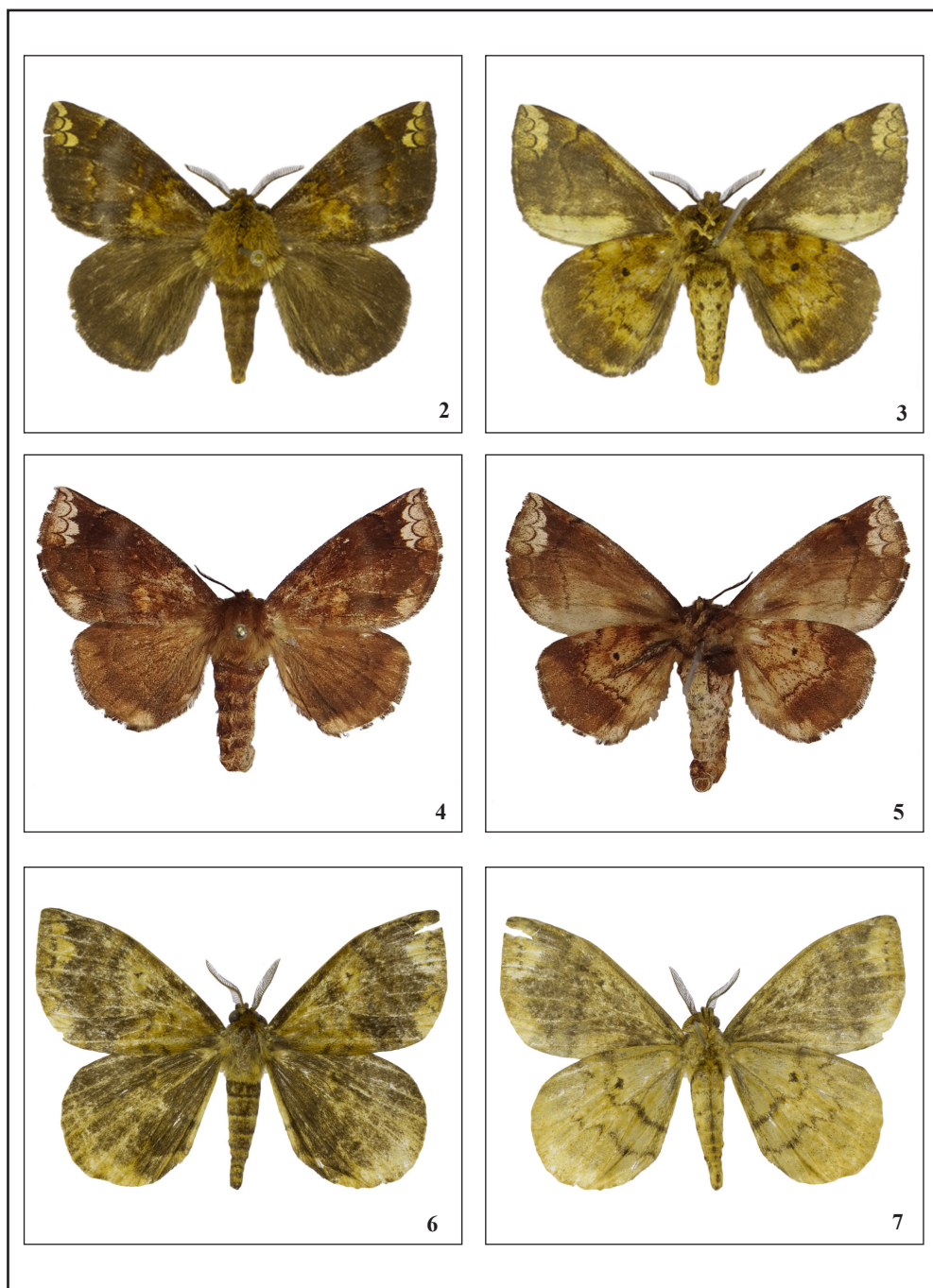
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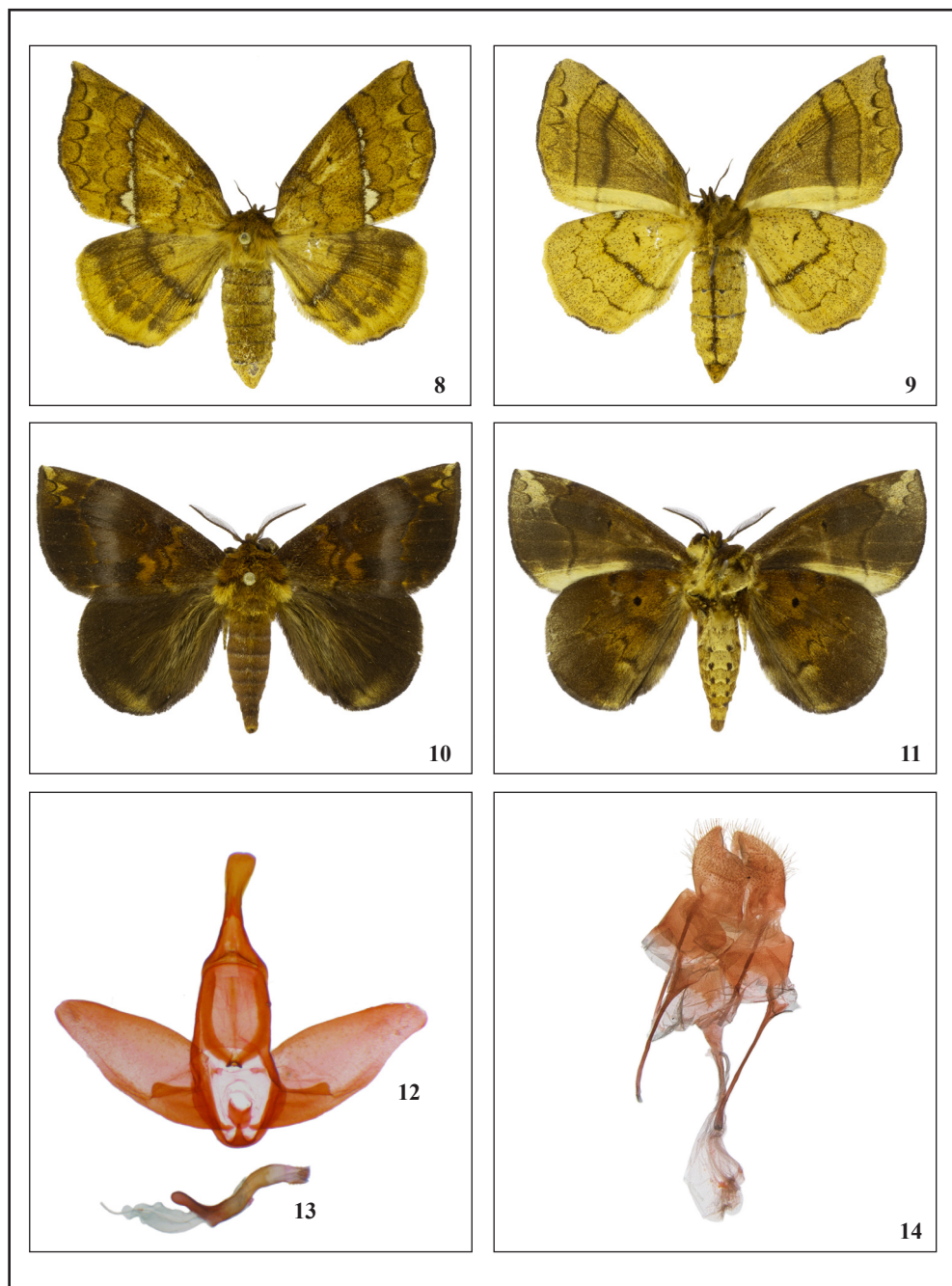
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Figures 2-7. *Prothysana* adults, dorsal and ventral views. 2-5. *P. terminalis*, Brazil: 2-3. Male, dorsal, ventral view. 4-5. Female, dorsal, ventral view. 6-9. *P. felderi*: 6-7. Male, Costa Rica, dorsal, ventral view.



Figures 8-14. Female, ventral view. **8-9.** *P. felderi*: Female, Panama, dorsal, ventral view. **10-11.** *P. magna*, male holotype, Brazil, dorsal, ventral view. **12-14.** *P. terminalis*, Brazil: **12.** Male, ventral view. **13.** Aedeagus, lateral view. **14.** Female, ventral view.



Figures 15-21. 15. Male, ventral view. 16. Aedeagus, lateral view. 17. *P. magna*, paratype, Brazil: 18. Aedeagus, lateral view. *P. terminalis* Brazil: 19. Larva, last instar. 20. Cocoon. 21. Pupal skin.

