

# ***Periphoba campisi* sp. n. from Minas Gerais and *Catacantha zemaria* sp. n. from São Paulo, two new species from southeastern Brazil (Lepidoptera: Saturniidae, Hemileucinae, Hemileucini)**

Carlos G. C. MIELKE, John CISESKI and Stefan NAUMANN

Carlos G. C. MIELKE, Caixa postal 1.206, 84.145-000 Carambei, Paraná, Brazil; cmielke1@uol.com.br

John CISESKI, 2610 River Rd., Junction City, WI, 54443-9602, USA; jdcjc@tds.net

Dr. Stefan NAUMANN, Hochkirchstrasse 11, D-10829 Berlin, Germany; sn@saturniidae.com

**Abstract:** Two Hemileucinae (Saturniidae) species from southeastern Brazil are described as new. One *Periphoba* HÜBNER, [1820] species from southwestern Minas Gerais: *Periphoba campisi* sp. n., differing from the most similar species, *P. hircia* (CRAMER, 1775), mainly by the male wing shape, ornamentation, and male genitalia, and one *Catacantha* BOUVIER, 1930 species from eastern São Paulo State: *Catacantha zemaria* sp. n., differing from the most similar species, *C. ferruginea* (DRAUDT, 1929) as well mainly by the male wing shape, ornamentation, and male genitalia. The male holotypes of both newly described species are deposited in the Entomological Collection of the Oswaldo CRUZ Institute, Rio de Janeiro, Rio de Janeiro State, Brazil.

**Key words:** Distribution, Neotropical, new species, taxonomy.

***Periphoba campisi* sp. n. aus Minas Gerais und *Catacantha zemaria* sp. n. aus São Paulo, zwei neue Arten aus Südostbrasilien (Lepidoptera: Saturniidae, Hemileucinae, Hemileucini)**

**Zusammenfassung:** Zwei Hemileucinae-Arten (Saturniidae) aus dem Südosten Brasiliens werden als neu beschrieben. Zum einen eine Art der Gattung *Periphoba* HÜBNER, [1820] aus dem Südwesten von Minas Gerais: *Periphoba campisi* sp. n., die sich von der ähnlichsten Art, *P. hircia* (CRAMER, 1775), hauptsächlich durch die Flügelform, Ornamentik und die männlichen Genitalstrukturen unterscheidet; und zum anderen eine Art der Gattung *Catacantha* BOUVIER, 1930 aus dem Osten des Bundesstaats São Paulo: *Catacantha zemaria* sp. n. Sie unterscheidet sich von den ähnlichsten Art, *C. ferruginea* (DRAUDT, 1929), vor allem durch die männliche Flügelform, Ornamentik und die männlichen Genitalstrukturen. Die männlichen Holotypen beider neubeschriebener Arten werden in der Entomologischen Sammlung des Oswaldo-Cruz-Instituts, Rio de Janeiro, Rio de Janeiro, Brasilien, hinterlegt.

## **Introduction**

In some recent expeditions to the Canastra region, in southwestern Minas Gerais, and to the Bocaina region, in the eastern São Paulo state, have revealed two new species of Hemileucinae, Saturniidae.

From the first place, the Canastra Mountain range, comes a pair of a *Periphoba* species. The similarity of the wing ornamentation of these specimens with that of *P. hircia* (CRAMER, 1775) was immediately identified, although some distinctive/unique traits, such as the forewing groundcolour, called our attention. Furthermore, *P. hircia* is a widespread species throughout the Amazon basin, so the presence of a similar phenotype at such a disjunct locality in a distinct biotope (Cerrado) motivated a detailed examination of the collected specimens, which revealed an undescribed species.

The genus *Periphoba* HÜBNER, [1820] has been focus of much taxonomic work in recent years, with over 30 new species being described (MIELKE & FURTADO 2006, BRECHLIN & MEISTER 2010, MIELKE et al. 2017, BRECHLIN et al. 2019) since LEMAIRE (2002), when only 13 species were known. MIELKE et al. (2017) described the ninth species known to be present in Brazil, showing the geographical species of all Brazilian species, except that of *P. hircia* (CRAMER, 1775) which is widespread in the Amazon basin. Later, an additional species, *P. cearaiana* BRECHLIN, 2019 was described from Ceará, northeastern Brazil. The genus is composed by medium-sized adults and is present from Mexico to Bolivia and southern Brazil. *Periphoba* was redescribed and its apomorphies defined by LEMAIRE (2002). The present article increases the known species diversity of *Periphoba* within Brazil to eleven.

In the second place, a unique specimen of the genus *Catacantha* BOUVIER, 1930 was collected. The forewing ornamentation was a little distinct when compared to the well known *C. ferruginea* (DRAUDT, 1929) and a detailed examination of its morphology, especially of its genitalia, has revealed an undescribed species.

As mentioned for *Periphoba*, *Catacantha* has been also focus of much taxonomic work in recent years (BRECHLIN et al. 2010, BRECHLIN & MEISTER 2012, BRECHLIN et al. 2013). Since LEMAIRE (2002), who recognized five species, another nine species were described (two from Brazil), although three of them were later recognized as synonyms (BRECHLIN & MEISTER 2012). Currently a total of 11 species are recognized, and six being present in Brazil. The present article increases the known species diversity of *Catacantha* within Brazil to seven.

## **Collection abbreviations**

CEIOC Entomological Collection of the Oswaldo CRUZ Institute, Rio de Janeiro, Rio de Janeiro, Brazil.

CGCM Coll. Carlos G. C. MIELKE, Curitiba, Paraná, Brazil.

## **Other abbreviations**

FW Forewing.

HT Holotype.

HW Hindwing.

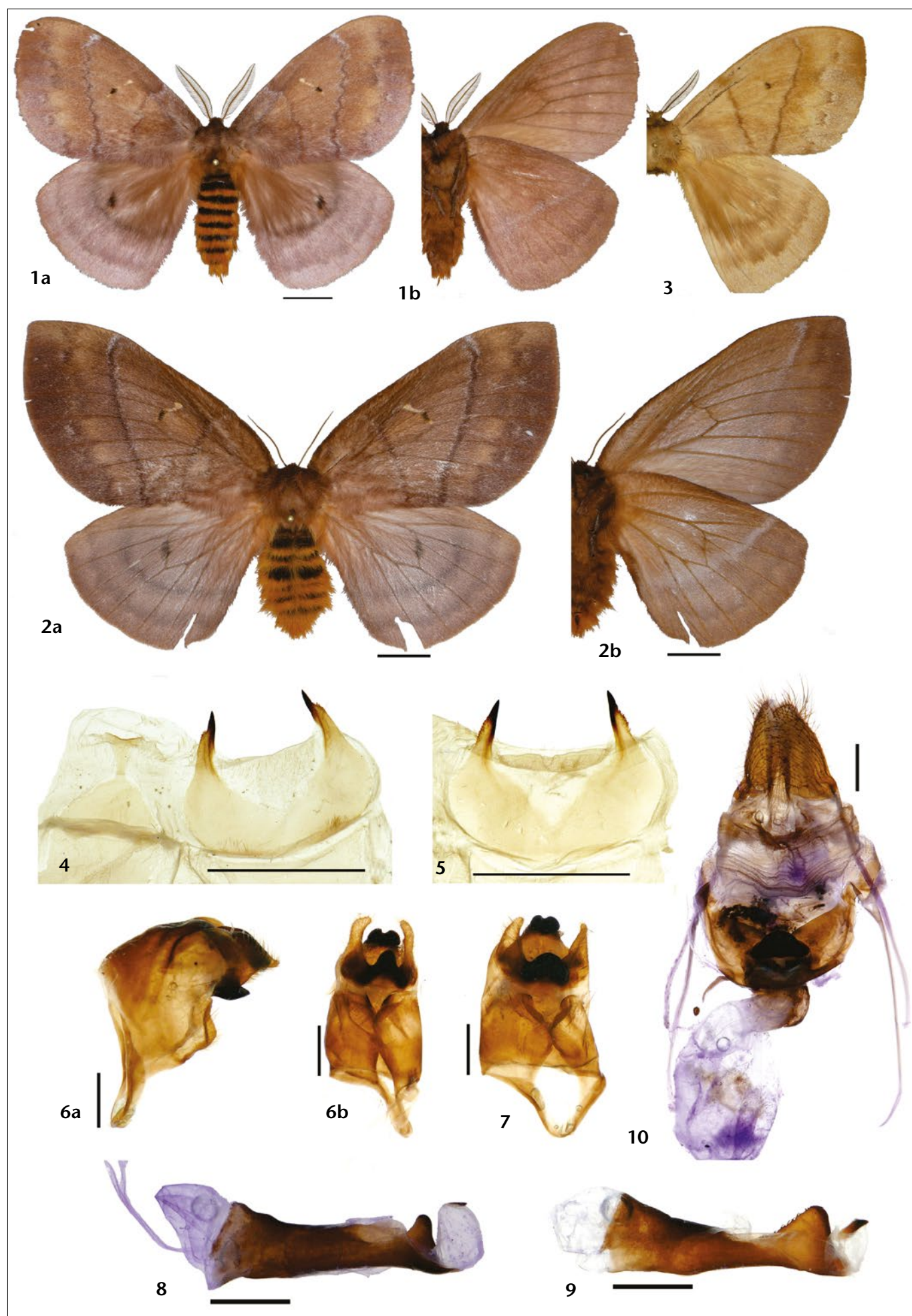
PT Paratype.

## **Descriptive part**

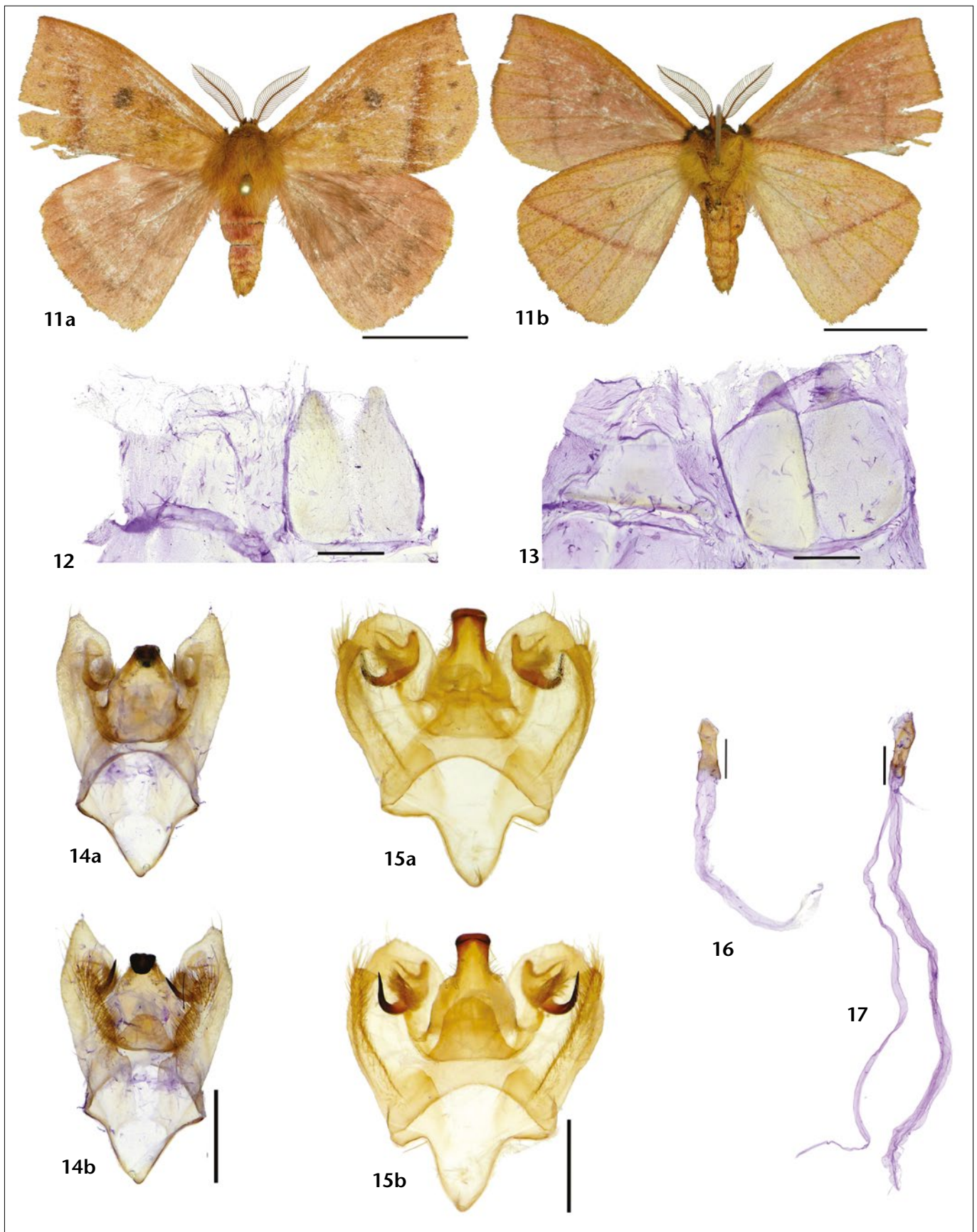
### ***Periphoba campisi* sp. n.**

Figs. 1, 2, 4, 6, 8, 10.

**Holotype** ♂ (Figs. 1a, 1b): with the following labels (separated by quotes): "Holotypus, *Periphoba campisi* C. MIELKE, CISESKI & NAUMANN des. 2020" "BRAZIL – Minas







**Figs. 1–10:** *Periphoba* specimens, abdomen, and genitalia. **Figs. 1–2:** *P. campisi* sp. n. HT ♂ dorsal (1a), ventral (1b); PT ♀ dorsal (2a), ventral (2b). **Fig. 3:** *P. hircia* ♂ dorsal view (3), French Guiana, Cacao, Km 60, CARLOT leg. (CGCM 18.954). — Scale bar: 1 cm. — **Fig. 4:** *P. campisi* sp. n. ♂ HT VIII sternite. **Fig. 5:** *P. hircia* ♂ VIII sternite (CGCM 18.954). — Scale: 5 mm. — **Fig. 6:** *P. campisi* sp. n. HT ♂ genitalia: lateral view (6a), ventral view (6b). **Fig. 7:** *P. hircia* ♂ genitalia: ventral view (CGCM 18.954). **Fig. 8:** *P. campisi* sp. n. HT ♂ phallus: lateral view. **Fig. 9:** *P. hircia* ♂ phallus: lateral view (CGCM 18.954). **Fig. 10:** *P. campisi* sp. n. PT ♀ genitalia: ventral view. — Scale bar: 1 mm. **Figs. 11–17, 19–20:** *Catacantha* specimen, abdomen, and genitalia. **Fig. 11:** *Catacantha zemaria* sp. n. HT ♂ dorsal (11a), ventral (11b). — Scale bar: 1 cm. **Fig. 12:** *C. zemaria* sp. n. ♂ HT VIII sternite. **Fig. 13:** *C. ferruginea* ♂ VIII sternite, Brazil, Rio de Janeiro, Itatiaia, 1100 m, S.VIII.1966, N. TANGERINI leg. (CGCM 18.652 [CGCM]). — Scale bar: 5 mm. — **Fig. 14:** *C. zemaria* sp. n. HT ♂ genitalia: dorsal view (14a), ventral view (14b). **Fig. 15:** *C. ferruginea* ♂ genitalia: dorsal view (15a), ventral view (15b) (CGCM 18.652). **Fig. 16:** *C. zemaria* sp. n. HT ♂ phallus: lateral view. **Fig. 17:** *C. ferruginea* ♂ phallus: lateral view (CGCM 18.652). — Scale bar: 1 mm..

Gerais, São Roque de Minas, São José do Barreiro, Serra da Canastra [Nat. Park], Casca D'Anta, 900 m, 16. XI. 2017, C. MIELKE & E. JOERKE leg." Deposited in CEIOC.

**Paratype:** 1 ♀, locality and collector as the holotype, 9.–10. XI. 2018 (CEIOC).

**Etymology.** The new species is named in honour of Marcos CAMPIS (Morro Agudo) in recognition of his friendship and for his efforts on photographing many Lepidoptera species in the Serra da Canastra. It is a noun in the genitive case derived from the personal name CAMPIS. The gender of the name is masculine.

## Description

♂ (Figs. 1a, 1b). FW length: 43 mm; wingspan 80 mm. Antenna (53 segments) bipectinate, the distal pair of pectinations on each segment much reduced, rami yellowish-brown, downcurved, symmetrical, arising from base of segment; ventrally serrate. Frons, vertex, and labial palpus brown. Thorax dorso-anteriorly concolorous as head, lighter posteriorly. Legs coloured as thorax with sparse pinkish-brown scales posteriorly; tarsi dark grey ventrally. FW slightly elongated, apex rounded, outer margin convex; dorsal ground colour light brown with yellow hue without differentiation among ante-, median, and postmedian areas, the latter with a premarginal band marked with light yellowish-brown distally and with marginal band slightly marked, irregular proximally; ante- and postmedian lines greyish-brown bordered proximally and distally with whitish scales, more prominent on the latter near costa; antemedial line convex and irregular, postmedian line almost straight, undulate, bent inward anteriorly; discal spot as small dot, darker than lines, linked to another light yellow dot. HW coloured as the FW, proximal area light brown; antemedial line absent, postmedian line coloured as FW lines; discal spot coloured as the FW stigma, two or three times bigger; marginal band as on the FW. Ventral side uniformly coloured, lighter than thorax. FW postmedian line faintly marked, HW postmedian line as whitish band. Abdomen dark yellow, ringed with black dorsally. Tergite VIII compound, formed by two triangular portions, anteriorly with base wide and posteriorly almost as a bar with narrow base and long sides; sternite VIII U-shaped, expanded laterally, armed with two reinforced spines on each side and each with small teeth laterally (Fig. 4).

♂ **Genitalia** (Figs. 6a, 6b, 8). Tegumen projected posteriorly, fused with saccus, the latter slightly projected anteriorly. Uncus slightly projected downwards, densely sclerotized, grooved dorsally, distally bilobate. Gnathos with three projections, two triangular arms laterally with convex margins posteriorly, one mesally as a semi-circle lobule (Fig. 6b). Valva much reduced. Phallus asymmetrical, shaft distally bears an upward process on the right side; the left lateral wall wider distally with postero-dorsal portion at an almost right angle; bulbous ejaculatorius one fourth length of the phallus; vesica armed with a tiny cornutus (Fig. 8).

♀ (Figs. 2a, 2b). FW length: 55 mm; wingspan 105 mm. Antenna (50 segments) bidentate, rami dark yellowish;

ventrally serrate. Frons and labial palpus as in the male. Thorax dorsally coloured as for male, ventrally dark orange. Legs brown, posteriorly concolorous with thorax. FW elongated, apex not pronounced, outer margin convex; dorsal ground colour as for male, but slightly darker; ornamentation as for male, but postmedian line straighter, slightly undulate anteriorly. HW slightly lighter; ornamentation as in the male. Ventral side lighter than thorax. FW postmedian line as a whitish band primarily defined anteriorly nearer the costa, HW postmedian line as in male. Abdomen dark yellow, ringed with black dorsally, ventrally as for thorax.

♀ **Genitalia** (Fig. 10). Anterior and posterior apophyses with about 5 mm each. Lamella antevaginalis narrow; lamella postvaginalis densely sclerotized, triangular with distal angle rounded. Ductus bursae and corpus bursae membranous, the latter bag-like.

## Diagnosis

*Periphoba campisi* sp. n. resembles *P. hircia* (Fig. 3) due to the configuration of the lines on the forewing, and the asymmetrical phallus. The less elongated FW of the new species gives it a more rounded appearance than in *P. hircia*, but the genitalia provide the most important features. The mesial lobe of the gnathos in *P. campisi* sp. n. (Fig. 6b) is not projected as much as in *P. hircia* (Fig. 7), in the new species it is semi-circular instead of triangular. The sclerotized shaft of the phallus distally bears a right lateral process, which causes the genitalia to be asymmetrical, this process is wider in *P. hircia* (Fig. 9) than in *P. campisi* sp. n. (Fig. 8), and additionally, its left wall is widened distally, with its postero-dorsal portion nearly perpendicular to the shaft in *P. campisi* sp. n., while in *P. hircia* this process is reduced distally (Fig. 9). No significant differences were found in sternite VIII when comparing these species (Figs. 4, 5). As mentioned below, the geographical distribution helps to separate *P. campisi* sp. n. from the other species.

## Discussion

LEMAIRE (2002) designated the image figured by CRAMER (1775) as the lectotype of *P. hircia*. Another two available names, *Phalaena Attacus calchas* CRAMER, 1775 in CRAMER (1775) and *Phalaena Bombyx Amalia* STOLL, 1782 in STOLL (1782), were listed as synonyms by LEMIRE (2002), and also have their lectotypes designated in the same way. It is likely that *P. hircia* comprises a group of cryptic species based on the detailed examination of external morphology of various populations assigned to this species, and as suggested by the analysis of the mitochondrial DNA "barcodes" (C. MIELKE, unpublished). A detailed revision of the group would certainly result in a request to the International Commission on Zoological Nomenclature to overrule these lectotype designations in order to stabilize the taxa involved, since the various type series associated with the CRAMER and STOLL names seem to have been lost.



## Habitat and geographical distribution

*Periphoba campisi* sp. n. is only known from the Canastra mountain range, which is located in southwestern Minas Gerais (Fig. 18). No other *Periphoba* is known to be sympatric with *P. campisi* sp. n. All specimens were found at the border of the main Canastra plateau range where the Cerrado vegetation is predominant, with riparian forest (Fig. 19).

## *Catacantha zemaria* sp. n.

Figs. 11, 12, 14, 16.

**Holotype** ♂ (Figs. 11a, 11b): with the following labels (separated by quotes): “Holotypus, *Catacantha zemaria* C. MIELKE, CISESKI & NAUMANN des. 2020” “BRAZIL – São Paulo, São José do Barreiro, Bocaina, Bocaina Nat. Park, 1660 m, 13. IV. 2018, C. MIELKE & E. JOERKE leg.” Deposited in CEIOC. **Etymology.** The new species is named in honour to Maria R. S. MACHADO and José PAES (São José do Barreiro, SP). It is a noun in the genitive case derived from to their first names, using the nick name “Zé” and Maria contracted. The gender of the name is feminine.

## Description

♂ (Figs. 11a, 11b, 12). FW length: 21 mm; wingspan 40 mm. Antenna (42 segments) bipectinate, rami yellowish-brown, downcurved, symmetrical, arising from base of segment. Frons dark yellow some pinkish scales; vertex dark brown; labial palpus dorsally concolorous as vertex and ventrally as frons. Thorax dorso-anteriorly concolorous as frons with less pinkish scales, lighter posteriorly, ventrally yellow with a dark brown tuft at the base of the FW. Legs coloured as thorax; tarsi pinkish-brown. FW slightly elongated, apex acute and sharpened, slightly pronounced, outer margin straight from apex to  $M_3$ , then convex to tornus; dorsal ground colour slightly lighter than thorax with green hue; antemedial line barely visible, postmedial line grey, almost straight, bent outward to apex; ante-, median, and postmedian areas concolorous, the latter brown proximally, bordering the postmedial line, with grey spot between veins from apex to tornus; discal spot rounded and grey. HW subtriangular; light pink with sparse grey scales; antemedial line absent, postmedial line grey; discal spot absent; marginal area with a central grey band. FW ventral side light pink, costal margin and marginal band light brown; postmedial line grey, slightly waxy. HW ventral side yellow with scattered pink scales, postmedial line straight, pinkish-grey; stigma reduced to a tiny grey stripe. Abdomen dorsally pink with yellow scales posteriorly on each segment; ventrally concolorous with thorax but with sparse pink scales. Tergite VIII slightly more sclerotized than other abdominal segments, mesally less sclerotized suggesting two lateral portions, each with a posterior projection (Fig. 12).

♂ **Genitalia** (Figs. 14, 16). Tegumen not projected posteriorly, fused with valva and saccus, the latter triangular, projected anteriorly. Uncus projected downwards, densely sclerotized apically, distally simple. Gnathos projected posteriorly, almost twice wider

than longer (1.8 x). Valva trapezoidal, bilobed; dorsal lobe projected and tapered posteriorly; sacculus setose about 1 mm long. Phallus symmetrical, sclerotized shaft tapered distally; bulbos ejaculatorius with about 7 mm or 3.5 times longer than the sclerotized shaft.

♀ unknown.

## Diagnosis

*Catacantha zemaria* sp. n. resembles *C. ferruginea*, but can be easily distinguished by genitalia attributes (see table below).

**Table:** Differences between male genitalia of *Catacantha zemaria* sp. n. and *C. ferruginea*.

Character	<i>C. zemaria</i> sp. n.	<i>C. ferruginea</i>
Tegumen	Simple	Shortly bifid distally (Fig. 15b)
Dorsal lobe of valva	tapered	rounded (Figs. 15a, 15b)
Sacculus	ca. 1 mm	ca. 1,4 mm
Length Bulbos ejaculatorius/sclerotized shaft	3.5× longer (7 mm)	6× longer (12 mm) (Fig. 17)

## Discussion

*Catacantha zemaria* sp. n. is known from a single mountain range in the extreme east of São Paulo state. It is sympatric to *C. oculata* (SCHAUS, 1921), but not synchronic. The newly described species belongs to a phenotype which comprises two more species: *C. ferruginea* and *C. tabeae* BRECHLIN, MEISTER & VAN SCHAYCK, 2010. Easily distinguished from them, *C. zemaria* sp. n. bears a simple uncus, while the others show a bifid uncus. It is likely that *C. ferruginea* comprises a group of cryptic species as suggested by the analysis of the mitochondrial DNA “barcodes” (C. MIELKE and S. NAUMANN, unpublished). A detailed revision of the group is in need.

## Habitat and geographical distribution

*Catacantha zemaria* sp. n. is only known from the higher area of the Bocaina mountain range, which is located in eastern São Paulo state (Fig. 18). The biotope is compound by natural grasses field and Araucaria forest (Fig. 20). The male was attracted to UV light around 21 h.

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Fig. 18: Distribution (type localities) of *Periphoba campisi* sp. n. (red circle) and *Catacantha zemaria* sp. n. (blue circle) within southeastern Brazil. Figs. 19–20: Biotopes. *Periphoba campisi* sp. n. (19) and *Catacantha zemaria* sp. n. (20).

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