A new *Periphoba* Hübner, [1820] from southeastern and northeastern Brazil as a potential pest of *Eucalyptus* spp. plantations (Lepidoptera: Saturniidae, Hemileucinae, Hemileucini)

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Abstract: A new *Periphoba* Hübner, [1820] from southeastern and northeastern Brazil is described: *Periphoba* ***tephra*** **sp. n.** from Espírito Santo and Bahia. It differs from its closer relatives mainly by the male wing ground colour, arrangement of the ante- and postmedial lines of the forewing and male genitalia. The male holotype is deposited in Col. Padre Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil. *Periphoba* ***tephra*** **sp. n.** is the first species of the genus recorded as a potential pest of *Eucalyptus* spp. plantations in Brazil. Biological aspects of the new species are mentioned.

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

Eine neue *Periphoba* Hübner, [1820] aus Südost- und Nordostbrasilien, ein potentieller Schädling von *Eucalyptus*-Monokulturen (Lepidoptera: Saturniidae, Hemileucinae, Hemileucini)

Zusammenfassung: Eine neue *Periphoba* Hübner, [1820] aus Südost- und Nordostbrasilien, Espírito Santo, wird beschrieben: *Periphoba* ***tephra*** **sp. n.** Die Art unterscheidet sich von ähnlichen Arten in erster Linie bei dem männlichen Grundton der Flügel, sowie der prä- und postmedial Linien der Forderflügel und männlichen Genitalien. Holotypus Männchen in der Coleção Padre Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brasilien. *Periphoba* ***tephra*** **sp. n.** ist die erste Art der Gattung, die als Schädling in *Eucalyptus*-Pflanzungen in Brasilien bekannt ist. Einige biologische Aspekte werden diskutiert.

Introduction

The genus *Periphoba* Hübner, [1820] is characterized by medium-sized moths ranging from Mexico to Bolivia and southern Brazil with apomorphies present in the male antenna and genitalia (Lemaire 2002). Since Lemaire's revisionary book "The Saturniidae of America, les Saturniidae Americains, Hemileucinae, vol. 4", which reports 13 *Periphoba* species, 10 additional species have been described, and one more revalidated since then (Mielke & Furtado 2006, Brechlin & Meister 2010). In summary, 24 species are recognized, with eight present in Brazil (Mielke & Furtado 2006). Within this country, three are endemic to the Amazonian region: *P. augur* (Bouvier, 1929), *P. hircia* (Cramer, 1775), and *P. moseri* Mielke & Furtado, 2006. The others are known from different localities: *P. pessoai* Mielke & Furtado, 2006 only known from Ceará, *P. courtini* Lemaire, 1994 only known from the type locality (a drier area in Bahia), *P. galmeidai* Mielke & Furtado, 2006 and *P. tangerini* Mielke & Furtado, 2006 typical from Cerrado vegetation, and *P. parallela* (Schaus, 1921) endemic to the dense ombrophilous forest of the Atlantic Mountain slopes, from Rio de Janeiro south to Santa Catarina (Mielke & Furtado 2006).

Little is known about the biology and host plants of *Periphoba* spp. Gardiner (1967) described some biological aspects of *P. hircia* and *P. arcaei* (see Lemaire 2002: 840) and mentioned both species as polyphagous, citing some non-native species as host plants. Janzen (1984) listed several other native plants for *P. arcaei* (Druce, 1886) reinforcing such polyphagia. Couturier & Kahn (1993) registered *P. hircia* as a pest in Peru, feeding on African oil palm (*Elaeis guineensis* Jacquin). The same species was found in Venezuela, feeding on *Eucalyptus urophylla* (Blake) (Rosales 2004), and in Northern Brazil, where Parreira et al. (2014) found caterpillars defoliating trees in plantations of *Acacia mangium* Willdenow.

Eucalyptus trees as well as other forest species can be damaged by various pests. The most common insect pests include leaf cutting ants (Zanetti et al. 2000), defoliating caterpillars and beetles (Anjos & Majer 2003, Zanuncio et al. 2003). In the southeastern and northeastern Brazilian states of Espírito Santo and Bahia, respectively, an outbreak of a *Periphoba* species severely defoliating trees was noticed between 2013 and 2014 in *Eucalyptus* spp. plantations. The species was identified as new, thus it is described here including some aspects of its biology. The present article raises the species diversity of *Periphoba* within Brazil to nine, and results in 25 total species in the genus.

Abbreviations

CGCM	Coll. Carlos G. C. Mielke, Curitiba, Brazil.
CPAC	Coll. Embrapa Cerrados, Planaltina, Distrito Federal, Brazil.
DZUP	Coll. Padre Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil.
FW	Forewing.
HT	Holotype.
HW	Hindwing.
PT	Paratype.

Periphoba tephra sp. n.

Figs. 1–4, 6–7, 9, 11–13, 15, 17, 21–28.

Holotype ♂ with the following labels (separated by quotes): "Holotypus, *Periphoba tephra* C. Mielke, O. Mielke, Mafia & Silva det. 2016" "Brazil, ES [Espírito Santo], Jaguaré, Fibria Celulose S/A, I. 2013, J. B. Silva leg., Codigo 12126" "DZ 33.149". – Figs. 1a, 1b. Deposited in DZUP.

Paratypes (in total 5 ♂♂, 10 ♀♀), all **Brazil: Espírito Santo**: 3 ♂♂, 7 ♀♀, same data as the holotype (DZ 33.159, DZ 33.169, DZ 33.189, DZ 33.199, DZ 33.209, DZ 33.219, DZ 33.239 [DZUP]; CGCM 33.064, CGCM 33.075, CGCM 33.256 [CGCM]); 2 ♂♂, 3 ♀♀, Aracruz, Fibria Celulose S/A, 17. VIII. 2014, J. B. Silva leg., Codigo 12128 (DZ 33.249, DZ 33.259, DZ 33.269, DZ 33.279 [DZUP]; CGCM 33.296 [CGCM]).

Etymology. The species name is a reference to the grey wing ground colour of the male, it is derivate from the ancient Greek (τέφρα) which means "ash".

♂ (Figs. 1a, 1b, 2, 3). FW length: 50–54 mm; wingspan 95–100 mm. Antenna (ca. 64–67 segments) bipectinate, the second pectination pair much reduced, rami yellowish-brown, downcurved, and symmetrical, arising from the base of the segment, the latter ventrally serrate. Frons dark grey to light brownish-grey. Labial palpus darker grey, almost black. Thorax as the frons dorsally, ventrally darker. Legs coloured as thorax, hindleg with some lighter brown scales posteriorly. FW slightly elongated, apex rounded, outer margin convex; dorsal ground colour light grey to light brownish-grey, lighter than thorax without differentiation among ante-, median, and postmedian areas, the latter with marginal band slightly marked, irregular proximately; ante- and postmedial lines greyish-brown with variable distances between them, the former straight forming an acute angle with inner margin, the latter oblique inward; discal spot as a small dot or barely marked, coloured as the lines. HW coloured as the FW, proximal area light yellowish-brown; antemedial line absent, postmedial line wider as a band, coloured as the FW lines; discal spot darker, in some specimens barely marked, rounded or rectangular; marginal band as on the FW. Ventral side coloured as thorax, proximal areas of the FW and HW light brown; postmedial lines sometimes suffused with whitish scales. Abdomen dark yellow to orange ringed with black dorsally. Tergite VIII compound, formed by two triangle-like portions, an anterior with the base wide and a posterior almost as a bar with a narrow base and long sides; sternite VIII U-shaped, expanded laterally, armed with two reinforced and convergent spines on each side (Figs. 6–7).

♂ **genitalia** (Figs. 9, 11–13, 15). Tegumen projected posteriorly, fused with saccus, the latter slightly projected anteriorly. Uncus slightly projected downwards, densely sclerotized, grooved dorsally, distally bilobate and slightly expanded laterally. Gnathos barely distinct; U-shaped with three projections, two triangular arms laterally with convex margins posteriorly, and mesally a triangular/conical lobule (Figs. 11–13), variable in size and shape. Valva much reduced. Phallus with a bulbus ejaculatorius one fourth of the length of the symmetrical aedeagus; vesica armed with a cornutus (Fig. 15).

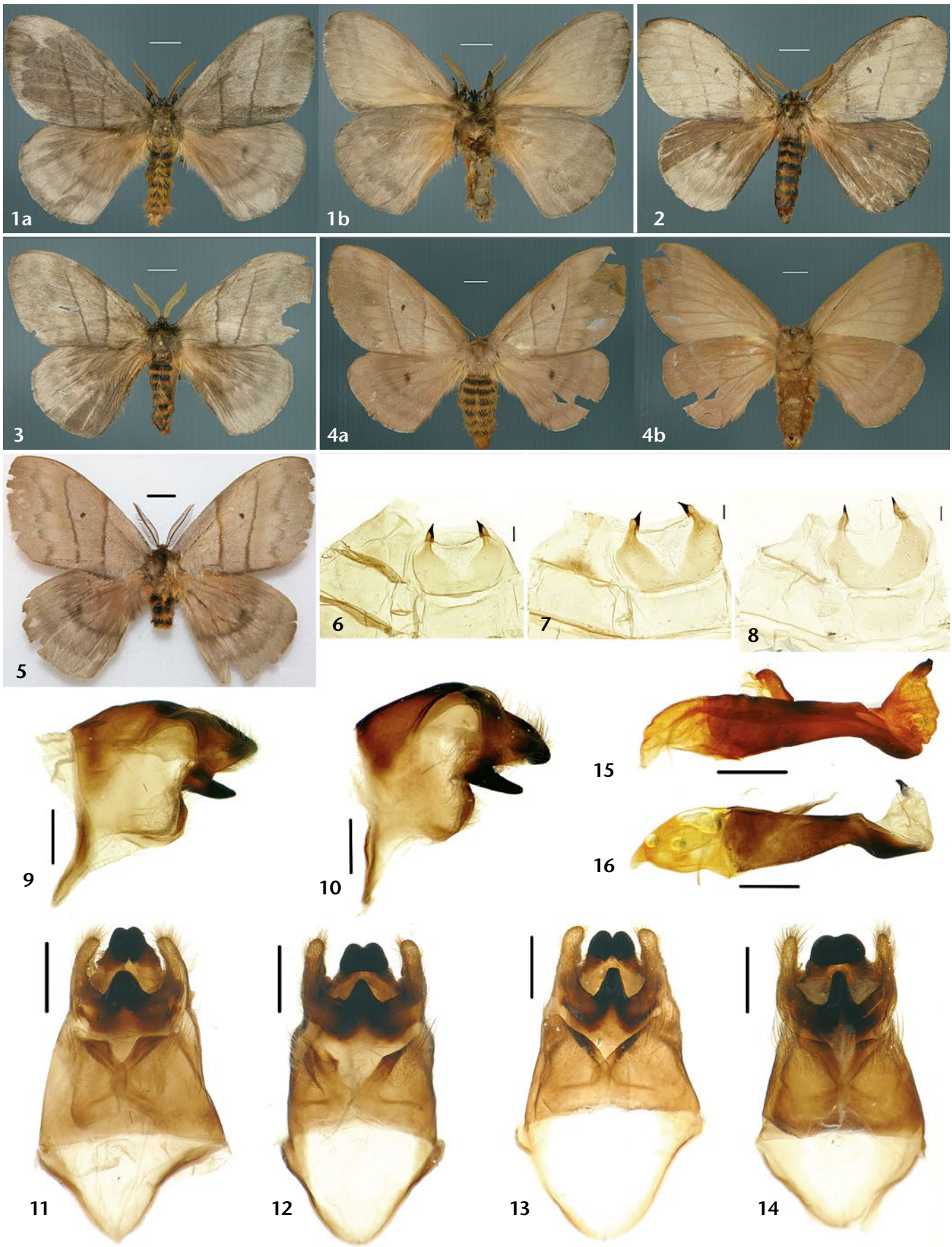
♀ (Figs. 4a, 4b). FW length: 60–67 mm; wingspan 115–125 mm. Antenna (ca. 62–67 segments) bidentate, each segment serrate ventrally; rami dark yellowish. Frons dark grey to light brown. Labial palpus as in the male. Thorax light brown to brown, ventrally orange to dark orange. Legs coloured as thorax. FW elongated, apex not pronounced, outer margin convex; dorsal ground colour as the thorax without differentiation among ante-, median, and postmedian areas, marginal band darker; ante-, postmedial lines, and discal spot as in the male, both lines sometimes bordered with whitish scales anteriorly. HW coloured as the FW or slightly darker; lines and discal spot as in the male; marginal band as on the FW. Ventral side coloured as the thorax, proximal areas of the FW and HW light brown; postmedial lines sometimes suffused with whitish scales. Abdomen dark yellow to orange ringed with black dorsally.

Diagnosis

Periphoba tephra sp. n. resembles *P. courtini* (Fig. 5) due to the configuration of the lines on the four wings, but the latter is distinguished by the more contrasting discal spots on the FW and HW, by the postmedial line on the HW which is prominent in the latter and slightly marked in the former, and by the light brownish ground colour. No differences were found in the sternite VIII nor in the male genitalia between these two species. When compared to *P. parallela, P. tephra* sp. n. is easily distinguished by the straight antemedial line on the FW, while in the latter it is oblique inward. The lines are less contrasting and the discal spot less well-marked or even absent on the FW and HW in *P. tephra* sp. n., in addition, the discal spot on the HW is well separated from the postmedial line, while in *P. parallela* is almost contiguous. In both species the sternite VIII is expanded laterally, but the lateral spines are more heavily sclerotized in *P. tephra* sp. n. than in *P. parallela* (Fig. 8). The uncus is softly curved in *P. tephra* sp. n., while in *P. parallela,* it is clearly curved downwards (Fig. 10) and its distal bilobate portion is wider in the latter (Fig. 14). *P. tephra* sp. n. differs from *P. galmeidai* and *P. tangerini* by the greyish ground colour, the less contrasting lines, the wider wingspan, and the lateral expansion in the male sternite VIII. *P. moseri* and *P. augur* differ from *P. tephra* sp. n. by a clear second pair of pectinations on the antennae, by the oblique inward FW antemedial line and by the yellow abdomen dorsally. In spite of it not being present in Brazil, *P. punoensis* Brechlin & Meister, 2010 of Peru can be distinguished by the prominent lines and discal spots on the four wings. All the remaining species of the genus bear an asymmetrical phallus and/or the antemedial line of the FW is outwardly oblique. As mentioned below, the geographic distribution helps to separate *P. tephra* sp. n. from the other species.

Geographical distribution

Periphoba tephra sp. n. is only known from two localities in Espírito Santo and from one locality of the extreme



Figs. 1–5: *Periphoba* specimens. **Figs. 1–4**: *Periphoba* ***tephra*** **sp. n.** HT ♂ dorsal (**1a**), ventral (**1b**); PT ♂ (DZ 33.159) dorsal (**2**); PT ♂ (CGCM 33.296) dorsal (**3**); PT ♀ (DZ 33.189) dorsal (**4a**), ventral (**4b**). — **Fig. 5:** *P. courtini* ♂: dorsal view; Brazil, Bahia, Camacan (CPAC). — Scale bars: 1 cm, not to exact scale. — **Figs. 6–16:** *Periphoba* ♂ abdomen and genitalia. **Figs. 6–7:** *P. tephra* sp. n. ♂ VIII sternite: HT (**6**); PT (DZ 33.159) (**7**). — **Fig. 8:** *P. parallela* ♂ VIII sternite (CGCM 19.578); Brazil, São Paulo, Tapiraí. — **Figs. 9, 11–13:** *P. tephra* sp. n. ♂ genitalia: HT lateral view (**9**), ventral view (**11**); PT (DZ 33.169) ventral view (**12**); PT (DZ 33.159) ventral view (**13**). — **Figs. 10, 14:** *P. parallela* ♂ genitalia: lateral view (**10**), ventral view (**14**) (CGCM 19.578). — **Fig. 15:** *P. tephra* sp. n. HT ♂ phallus: lateral view. — **Fig. 16:** *P. parallela* ♂ phallus: lateral view (CGCM 19.578). — Scale bars: 1 mm.

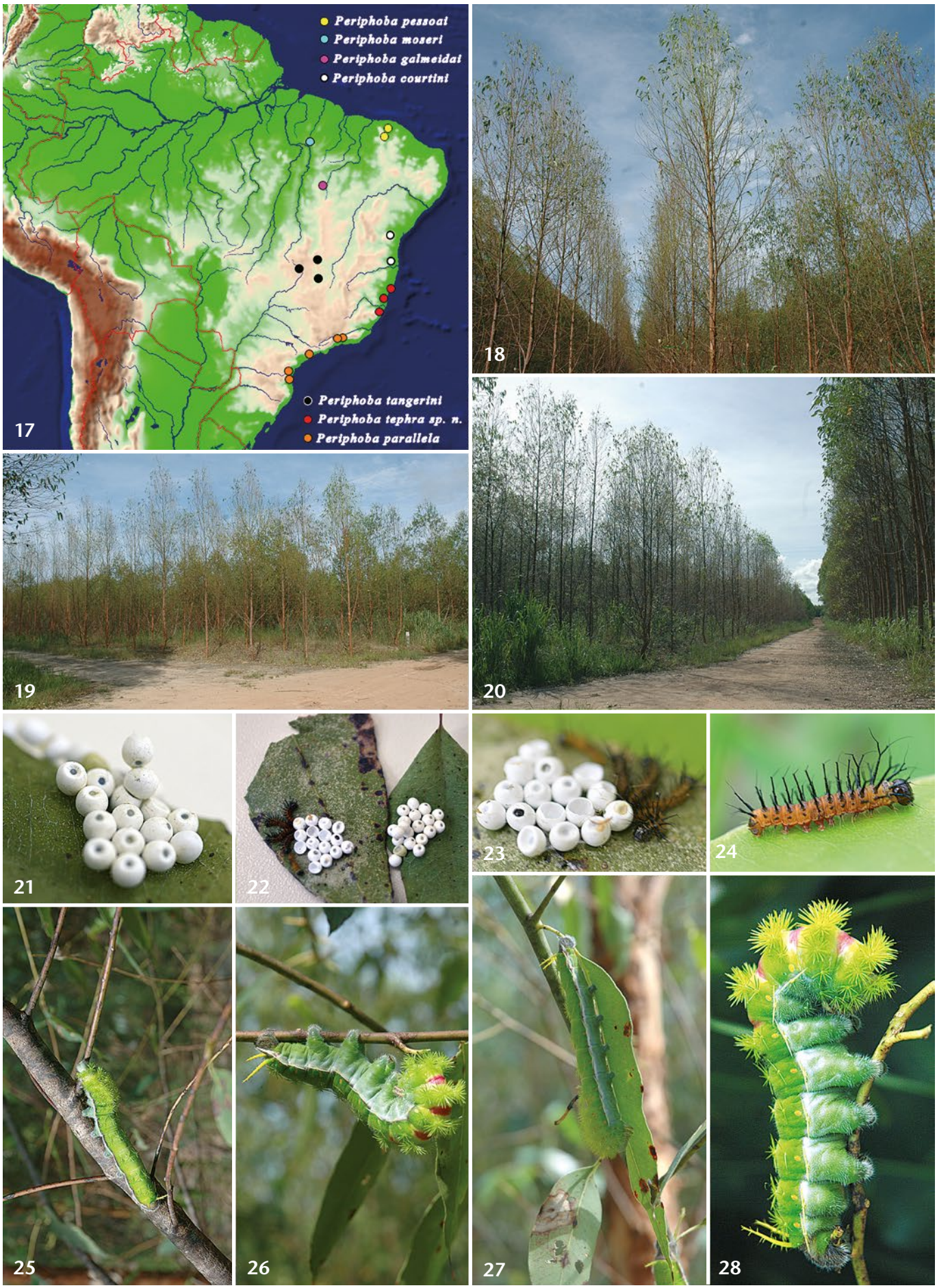


Fig. 17: Distribution of *Periphoba courtini*, *P. galmeidai*, *P. moseri*, *P. parallela*, *P. pessoai*, *P. tangerini* and *P. tephra* sp. n. within Brazil. — **Figs. 18–20:** Defoliation in *Eucalyptus* plantations in Espírito Santo, Brazil by *P. tephra* sp. n. — **Figs. 21–23:** *P. tephra* sp. n. oviposition. — **Fig. 24:** *P. tephra* sp. n. first larval instar. — **Figs. 25–28:** *P. tephra* sp. n. last larval instar.

south of Bahia. No other congeneric species is known to be sympatric to the newly described species. Excluding *P. augur* and *P. hircia,* which are widely distributed in the Amazon region, the distribution of the other Brazilian species is shown in the map (Fig. 16). A second locality for *P. courtini* is recorded for the first time and it is shown in the map, extending its distribution southwards.

Biology

Outbreaks of *P. tephra* sp. n. were observed on *Eucalyptus* spp. plantations of two years old trees in sites mentioned above (Figs. 18–20) in 2013 and 2014. The damages occurred from bottom to top tree canopy. All examined specimens were obtained in the lab through eggs or caterpillars in different stages harvested in the field. Although there are no available specimens from southern Bahia, it is assumed the outbreaks were caused by the same species.

The females lay eggs in cluster (Figs. 21–23) and the larvae are gregarious in the first stages. The first instar is characterized by a dark orange body with long black scoli on each segment (Fig. 24). The last instar closely resembles the larva of *P. arcaei* figured in Lemaire (2002), except for the long, yellowish-green subdorsal scoli of A9 (Fig. 25–28).

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