A new species of *Caio* Travassos & Noronha, 1958 from southeastern Brazil (Lepidoptera, Saturniidae, Arsenurinae)

Carlos G. C. Mielke

Carlos G. C. Mielke, Caixa postal 1206, 84.145-000 Carambeí, Paraná, Brazil; cmielke1@uol.com.br

Abstract: A new species, *Caio remus* **sp. n.**, from northeastern Minas Gerais, southeastern Brazil, is described. It is compared to the similar species *C. romulus* (Maassen, 1869), differing by the smaller wing length and the male genitalia. The male holotype of the new taxon is deposited in the Collection Padre Jesus Santiago Moure at the University Federal do Paraná, Curitiba, Brazil.

Key words: morphology, Neotropical, taxonomy.

Eine neue Art der Gattung *Caio* Travassos & Noronha, 1958 aus Südostbrasilien (Lepidoptera, Saturniidae, Arsenurinae)

Zusammenfassung: *Caio remus* **sp. n.** aus dem Nordosten von Minas Gerais in Südostbrasilien wird als neu beschrieben. Die neue Art wird verglichen mit der ähnlichen Spezies *C. romulus* (Maassen, 1869), die sich durch die geringere Flügellänge und in den männlichen Genitalien unterscheidet. Der männliche Holotypus ist in der Sammlung Padre Jesus Santiago Moure an der Universität Federal do Paraná, Curitiba, Brasilien, hinterlegt.

Introduction

The genus *Caio* Travassos & Noronha, 1958 is represented by a few disjunctly distributed Neotropical species. While the *Caio championi* (Druce, 1886) species-group is present from Mexico to western Ecuador and Venezuela (Lemaire 1980), the *Caio romulus* (Maassen, 1869) species-group is restricted to southeastern and southern Brazil, as well as northeastern Argentina (Lemaire 1980, Nunes et al. 2003, Prestes et al. 2009, Zapata & Krauczuk 2014, Núñez Bustos 2015).

Recently, a small series of specimens of a *Caio* from northeastern Minas Gerais (Brazil) was collected, which at first impression could be identified as *C. romulus*. However, certain aspects of the habitat and morphology of this population are noteworthy. Firstly, prior to the collection of these specimens, *Caio* was not known from Cerrado vegetation, and secondly, these specimens have a much smaller wingspan than typical *C. romulus*. A detailed examination of its external and genital morphology revealed that these *Caio* represent a new species, which is described here.

Abbreviations

CGCM	Collection Carlos G. C. Mielke, Curitiba, Paraná, Brazil.
CSNB	Collection Stefan Naumann, Berlin, Germany.
DZUP	Collection Padre Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil.
SMFL	Senckenberg-Museum, Lepidoptera collection, Frankfurt am Main, Germany.

Other abbreviations used

HT	holotype.	PT	paratype.
FW	forewing.	HW	hindwing.

Caio remus sp. n.

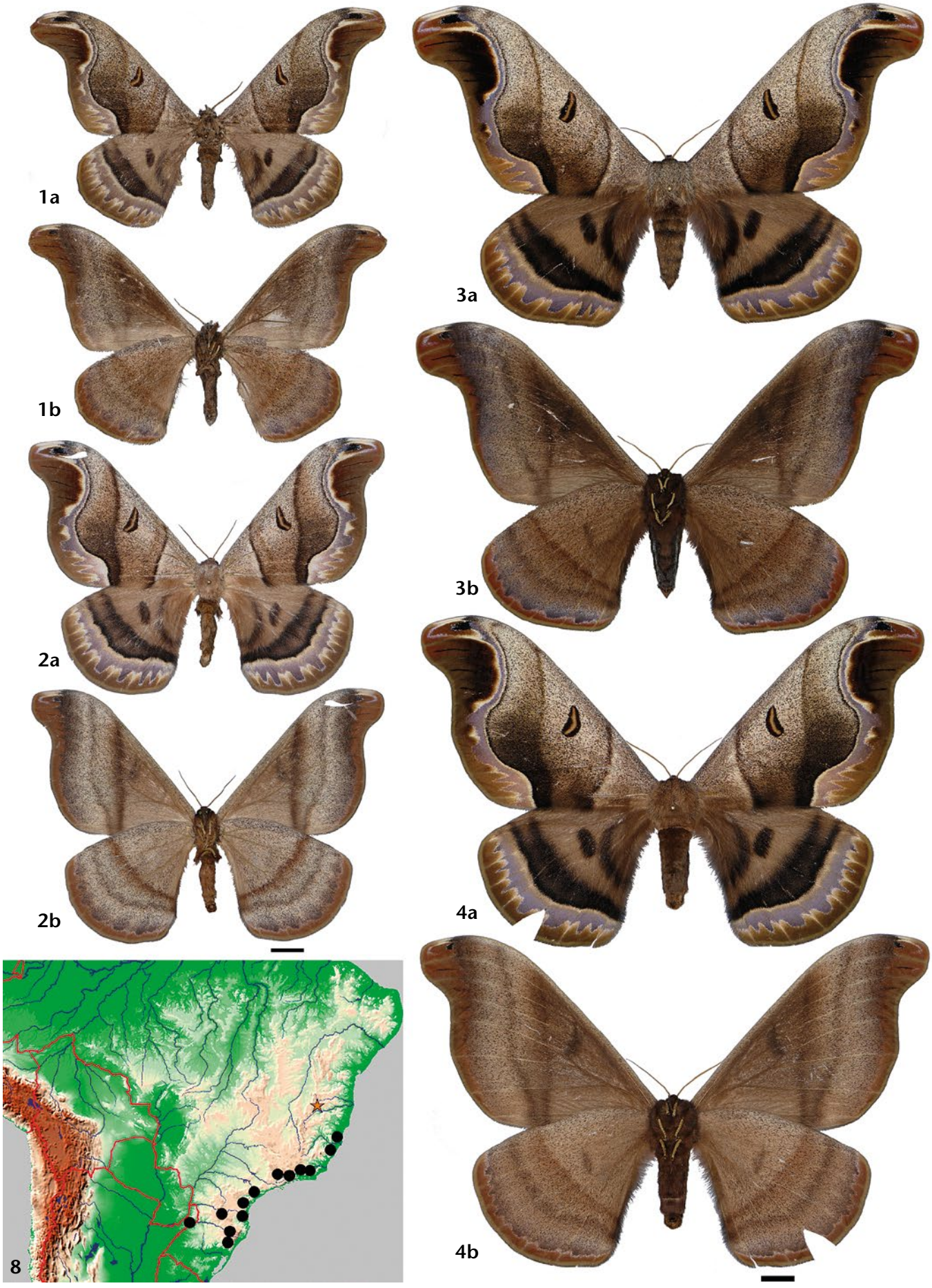
Figs. 1a, 1b, 2a, 2b, 5a, 5b, 5c, 6.

Holotype ♂ with the following labels (separated by forward slashes): /Holotypus, *Caio remus* C. Mielke des. 2017/ Brazil – MG, [Curral de Dentro] Maristela de Minas, 950 m, Serra do Anastácio., 20. xi. 2014., E. Abadie & P. Wagner leg./ 30.026 Col. C. Mielke/. Fig. 1a, 1b. Donated by the author and deposited in DZUP.

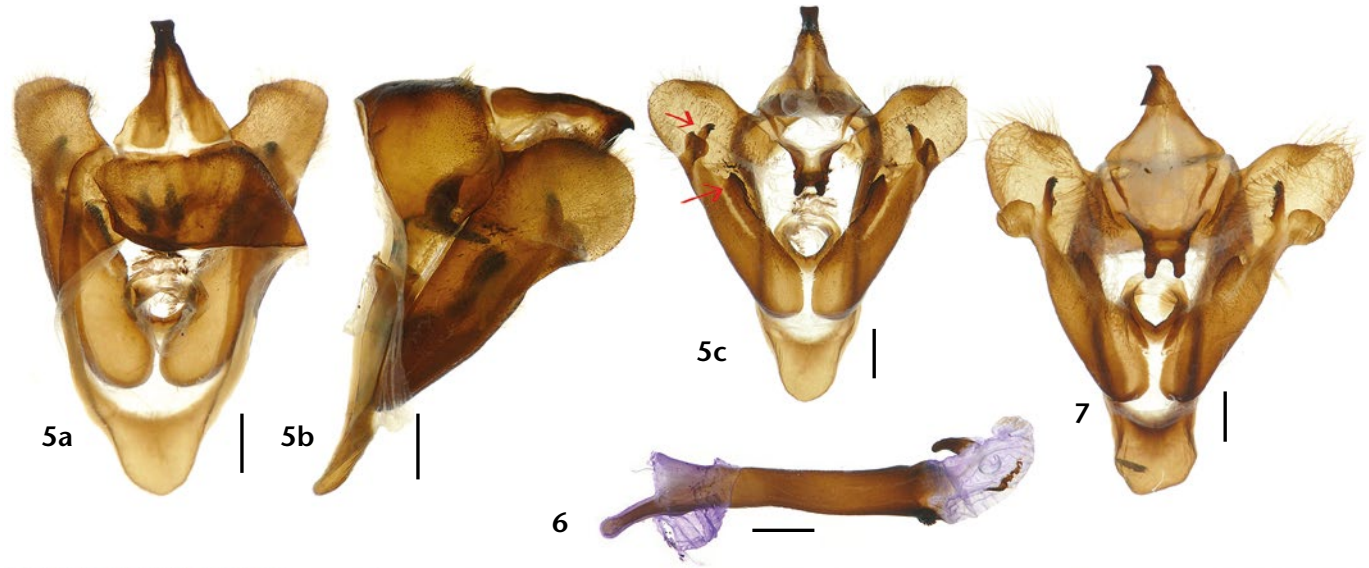
Paratypes, in total 2 ♂♂, 2 ♀♀. **Brazil**: **Minas Gerais**. 1 ♂, 1 ♀, same data as the HT (♂ [CSNB], ♀ CGCM 31.905 [CGCM]); 1 ♂, 1 ♀, same locality as the HT, 15. xi. 2000, Abadie leg. (♂ CGCM 27.432 [CGCM], ♀ CGCM 29.979 [SMFL]).

Etymology. While forming the specific name I follow the tradition of Maassen, who gave the specific name *romulus,* which supposedly is etymologically derived from the antic name of the founder of Rome, Italy: Romulus. The name of the new species, *remus,* is derived from Remus, the brother of Romulus, who according to myth, cofounded Rome with his brother. The gender of the name is masculine.

♂ (Figs. 1a, 1b). FW length: 60–63 mm; wingspan: 110–117 mm. Antenna (ca. 45 segments) straw coloured; frons and labial palpus greyish-brown. Thorax dorsally greyish-brown. Legs coloured as thorax, tarsi light brown. FW slightly elongated, apex falcate; ground colour slightly lighter than thorax with black speckling of scales except for marginal band; proximal antemedial line outwardly oblique, well-marked and brown; distal antemedial line in parallel to the proximal antemedial line, but poorly defined; postmedial line inwardly oblique, brown darkening to black posteriorly; antemedian area slightly lighter than thorax; median area coloured as for antemedian area, but darker brown posteriorly; stigma compound by bent light brown stripe surrounded by black; postmedian area coloured as for previous band but darker, tending to black posteriorly; marginal band wide, separated by an S-shaped black line bent at CuA_2, bordered by a narrow light grey diffusion near inner margin, followed by a grey band with irregularly edged distally, bordered by light grey which surrounds a black oval spot at apex, and finally by a wider brown band, lighter posteriorly, bordered by a narrow and uniform lighter marginal band reaching from apex to tornus. HW ground colour light brown; antemedial line black, curved inward, postmedial line straight and concolours with antemedial line; antemedian and median areas light brown, stigma oval, black; postmedian area darker, tending to black to inner margin; marginal band widely separated by a wavy, narrow, and black band bordered by a light grey, narrow, and diffuse band, followed by a grey



Figs. 1–2: *Caio remus* sp. n., HT ♂ dorsal (1a), ventral (1b); PT ♀ dorsal (2a), ventral (2b). **Figs. 3–4:** *Caio romulus*. ♂ dorsal (3a), ventral (3b) (CGCM 30.838); ♀ dorsal (4a), ventral (4b), (CGCM 30.728). — Scale bars 1 cm, specimens approximately at same scale. — **Fig. 8:** Geographical distribution within South America: *Caio remus* sp. n. (orange **star**), *Caio romulus* (black **circles**).



Figs. 5–6: *Caio remus* sp. n., ♂ genitalia (CGM 31.905): dorsal view (5a), lateral view (5b), ventral view (5c; arrows indicate the processes of sacculus), phallus lateral view (6). **Fig. 7:** *Caio romulus,* ♂ genitalia: ventral view (CGCM 22.992). — Scale bars 1 mm, pictures not exactly to the same scale. — **Fig. 9:** Biotope of *Caio remus* sp. n.

irregularly edged band distally bordered by light grey, and finally by a wider brown band bordered by a narrow and uniform lighter marginal band as in FW. The light grey band well contrasted on both wings. Ventrally, both wings faintly marked, except by the darker postmedial line and the premarginal and marginal bands, coloured grey and brown respectively. Abdomen coloured as the thorax.

♂ genitalia (Figs. 5a, 5b, 5c, 6). Similar structures as observed in *C. romulus* (see Lemaire 1980). Tegumen projected posteriorly, rectangular dorsally, projected ventrally and fused to saccus. Saccus U-shaped, slightly projected anteriorly. Uncus simple, triangular, grooved dorsally, projected posteriorly widening to a shortly bifid and downward curved tip with a triangular and sharp ventral process, uncus setose laterally. Gnathos as lateral and longitudinal bars. Arms of transtilla fused mesally, forming bilobed plate, each lobe digitiform. Valva elongated, widening and more rounded distally with lobate process proximal to tip of sacculus at ventral margin; sacculus thickened extending along ¾ of saccular valva margin with two processes, one basal (internal and dorsal) and one distal; basal process extending beyond half-length of sacculus (considering the basis of the valve to tip of distal process), carinate, about half length of thickened saccular region; distal process smaller, digitiform with teeth on tip. Sclerotized shaft of phallus with spiny protuberance on distally on either side; vesica armed with two cornuti, one as a lobe, one as a stripe. Sacculus thickened and with two heavily sclerotized processes: basal marginal process elongate,

carinate, about half length of thickened saccular region; distal process smaller, digitiform.

♀ (Fig. 2a, 2b). FW length: 63–64 mm; wingspan: 110–115 mm. Sexual dimorphism not pronounced, except for the filiform or much reduced dentation of the antennae, and more rounded (less falcate) wings.

Ethology and geographical distribution. All specimens of *C. remus* sp. n. are known only from the type locality (Fig. 8). Specimens were collected with UV lights and arrived before midnight. The region has a rainfall of about 700–1000 mm/year with rain starting around October/November (Alvares et al. 2014). The natural vegetation at the type locality is typical of Cerrado (Fig. 9).

Diagnosis. *Caio remus* sp. n., in spite of the general similarity with *C. romulus* (Figs. 3a, 3b, 4a, 4b), can be immediately distinguished by the smaller forewing length (*C. romulus,* ♂ FW length: 80–90 mm, wingspan: 140–165 mm; ♀ FW length: 80–86 mm, wingspan: 136–163 mm, which is on average roughly 25% larger than *C. remus*). In addition, the ground colour of the wings is lighter, with a paler appearance in *C. remus* sp. n. The light grey borders in the marginal area of all wings and both sexes in *C. remus* sp. n. are more contrasting and well-marked than in *C. romulus,* and the grey band in *C. remus* sp. n. tends to be a bright bluish-grey hue in *C. romulus*.

Ventrally, *C. remus* sp. n. is paler than *C. romulus* in both sexes. All examined *C. romulus* have highly contrasting tarsi due to the darkness of the thorax ventrally, while in *C. remus* sp. n. this is less evident due to the lighter colour of thorax.

In spite of the significant wingspan difference between both species, the ♂ genitalia overall do not differ in size between the two species. However the basal process of the sacculus extends beyond its half-length from the basis of the valve to the tip of its distal process, being carinate on its inner side in *C. remus* sp. n., while smaller and rounded in *C. romulus* (Fig. 7). In addition, the distal process of the sacculus in *C. romulus* is more prominent and ornamented laterally with several teeth, while in *C. remus* sp. n. teeth are present only on the tip.

Examined specimens of *Caio romulus*. In total 18 ♂♂, 6 ♀♀. All **Brazil. — São Paulo:** 1 ♂, Campos do Jordão, Lavrinhas, 1898 m, 11.–13. xii. 1998, R. Koike leg. (CGCM 35.664). 1 ♂, Apiaí, 600 m, 9.–12. ix. 2007, C. Mielke leg. (CGCM 30.838). — **Santa Catarina:** 1 ♀, São Bento do Sul, Rio Natal, 600 m, ix. 2015, O. Rank leg. (CGCM 30.728). 1 ♂, Urubici, Morro da Igreja, 1250 m, 27.–29. xii. 1997, C. Mielke leg. (CGCM 9.632). 1 ♂, Urubici, Serra do Panelão, 1250 m, 30. xii. 1997, C. Mielke leg. (CGCM 10.091). — 14 ♂♂, 5 ♀♀, representing already published locality data (CGCM).

Distribution map (Fig. 8) considers Lemaire (1980), Nunes et al. (2003), Prestes et al. (2009), Zapata & Krauczuk (2014), Núñez Bustos (2015), and the present article.

Discussion

This remarkable second Brazilian species of *Caio* comes from an area poorly surveyed by lepidopterists, highlighting this region's potential to support new endemic taxa. On the other hand, since Lemaire (1980) published distribution records of *C. romulus,* new reports have been recorded, expanding its known occurrence enormously into southern and western Brazil (Nunes et al. 2003, Prestes et al. 2009), crossing to northeastern Argentina (Zapata & Krauczuk 2014, Núñez Bustos 2015).

In addition, this species has been also found at higher elevations than were previously reported, from over 1300 m up to 1900 m in the Mantiqueira Mountains (Campos do Jordão, São Paulo), General Carneiro (Paraná; E. Abadie, pers. comm.), and Serra Geral Catarinense (Urubici, Santa Catarina) where the *Araucaria* forest is predominant.

Acknowledgements

We thank Esteban Abadie and Pablo Wagner (Buenos Aires) for proving us the type material. Also, for Ricardo Koike for providing additional records for *Caio romulus*. And finally, a special thanks to Ryan St Laurent (Gainesville) and Dr. Wolfgang A. Nässig (Frankfurt am Main) for all comments and helpful suggestions.

References

Alvares, C. A., Stape, J. L., Sentelhas, P. C., Gonçalves, J. L. M., & Sparovek, G. (2014): Köppen's climate classification map for Brazil. — Meteorologische Zeitschrift, Stuttgart, **22** (6): 711–728.

Lemaire, C. (1980): Les Attacidae americains. The Attacidae of America (= Saturniidae). 2. Arsenurinae. — Neuilly-sur-Seine (Ed. C. Lemaire), 199 pp. + 76 pls.

Nunes, F. G., Specht, A., & Corseuil, E. (2003): Saturniídeos (Lepidoptera, Saturniidae) ocorrentes no Centro de Pesquisas e Conservação da Natureza Pró-Mata. — Divulgações do Museu de Ciências e Tecnologia — UBEA/PUCRS, Porto Alegre, **8:** 55–62.

Núñez Bustos, E. O. (2015): Catálogo preliminar de Saturniidae de Argentina, con veintiún nuevos registros (Lepidoptera: Saturniidae). —Tropical Lepidoptera, Gainesville, **25** (1): 22–33.

Prestes, A. S., Nunes, F. G., Corseuil, E., & Moser, A. (2009): Arsenurinae and Ceratocampinae (Saturniidae) of Rio Grande do Sul state. — Journal of the Lepidopterist's Society, New Haven, **63** (4): 214–232.

Zapata, A. I., & Krauczuk, E. R. (2014): Primer registro del género *Caio* Travassos & Noronha, 1968 en Argentina (Lepidoptera: Saturniidae). — SHILAP, Revista de Lepidopterología, Madrid, **42** (166): 257–260.

Received: 16. v. 2018

 ISSN 0723-9912