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A new species of *Progomphus* Selys, 1854 (Odonata: Anisoptera: Gomphidae) from Minas Gerais state, Southeastern Brazil

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Abstract

Progomphus teolitavius **sp. nov.** (Odonata: Anisoptera: Gomphidae) is described and diagnosed based on a specimen collected in a gallery forest of Cerrado from Barroso municipality, Minas Gerais state, Brazil (-21.2238, -43.9895, 1033 m, 30.iii.2021, G.S. Santos leg.). The new species can be distinguished from congeners by its enlarged basal externo-lateral dilatation of cerci (which bears large teeth), and epiproct morphology.

Key words: Neotropical, South America, sanddragon, Atlantic Forest

Resumo

Progomphus teolitavius **sp. nov.** (Odonata: Anisoptera: Gomphidae) é descrita e diagnosticada com base em espécime coletado numa floresta de Galeria no Cerrado de Barroso, Minas Gerais, Brasil (-21.2238, -43.9895, 1033 m, 30.iii.2021, G.S. Santos leg.). A nova espécie pode ser diferenciada das espécies congêneres pela sua desenvolvida dilatação basal externo-lateral do cerco (que apresenta dentes grandes) e morfologia do epiprocto.

Palavras-chave: Neotropical, América do Sul, libélula, Mata Atlântica

Introduction

Gomphidae is a widespread taxon that inhabits a wide variety of aquatic habitats and has the highest diversity of Anisoptera species in the world after Libellulidae (Garrison *et al.* 2006; Paulson *et al*. 2022). The Neotropical genus *Progomphus* Selys, 1854 is the most speciose within Gomphidae, with 69 described species, the most recent species described in 2007 (Novelo-Gutiérrez 2007a, b). The late Dutch Odonatologist, Jean Belle (1920−2001), was the most prolific specialist on *Progomphus*, describing 33 species for this genus (Belle, 1973, 1994). Among his contributions, Belle (1973) revised *Progomphus* (52 species at that time), and grouped the species according to morphological characters. Belle (1990) added one more species, gave a better definition for the *guyanensis* Group, and later (Belle 1994) added four more Brazilian species and a key to the species known to occur in Brazil.

Here, we describe and diagnose a new *Progomphus* species, the 70th taxon of this speciose genus.

Material and methods

The specimen was collected perched on the marginal vegetation of a stream in March 2021. This locality consists of a gallery forest within the Cerrado Biome in an area known as “Cachoeira do Padeiro”.

Habitus was photographed using a Xiaomi Redmi Note 10 Pro smartphone and photos were processed in

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Photoshop® software. Illustrations were made using trace paper and scanned with Canon MG2400 at black and white 600 dpi with 100% magnification. Figures 2b−c, 2f, and 2i redrawn from Belle (1973); Figs. 2d and 2k redrawn from Belle (1994); Figs. 2g and 2j redrawn from Ris (1912).

Morphological terminology follows Belle (1973, 1994) except for wing venation. We follow Riek & Kukalová-Peck (1984) for wing venation characters. All measurements are in millimeters (mm).

Abbreviations: AL, abdomen length (including cercus); FW, fore wing; HW, hind wing; Pt, costal edge of FW pterostigma; S1–10, abdominal segments; TL, total length (including cercus).

The specimen is deposited in the biological collection of the Zoology Laboratory, Instituto Federal de Educação, Ciência e Tecnologia do sul de Minas Gerais, Campus Inconfidentes, Brazil (IFSULDEMINAS).

Results

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(Figs. 1, 2a, 2e, 2h)

Holotype (IFSULDEMINAS, C-0131). 1m#, Brazil, Minas Gerais, Barroso (-21.2238, -43.9895), 1033 m, 30.iii.2021, G.S. Santos leg. (IFSULDEMINAS).

Etymology. Named *teolitavius* (noun in apposition). A compound of '*teo*', after Theo de Magalhães, '*oli*', short for Olívia L. de Magalhães, and '*tavius*' short for Otávio C. S. de Magalhães, all children of MMS, who helped him in the collection of the described species.

Head (Fig. 1). Mouthparts pale yellow, black at the apices; eyes dark; antenna black, scape grey; labrum, ante-postclypeus, and basal portion of antefrons light brown; postfrons olive green; vertex dark brown; postocellar ridge black, with a slight concavity at its middle; occiput black; posterior area of the head black, with pale yellow lateral spots.

Thorax (Fig. 1). Prothorax mostly black, with pale yellow spots on each medial side. Pterothorax mostly black with pale yellow stripes; pale yellow antehumeral stripes thin, not connected with pale stripes on collar; a broad pale yellow stripe on the medial portion of each mesepisternum; metepimeron with a broad pale yellow stripe on its lower half; venter light brown. Femoral armature dark brown; inner face of profemur pale yellow, remainder brown; third tarsi about two-thirds the length of third tibia; lamina tibialis (or tibial keel) of first tibia one-fifth the tibial length.

Wings (Fig. 1). Hyaline, venation black; pterostigma black, occupying 5 cells on FW and 4.5 on HW; eight paranal cells from wing base to apex of subtriangle in FW, six in HW; antenodal crossveins on FW 12/12, on HW 9/9, the fourth one thickened in all wings; postnodal crossveins on FW 8/8, on HW 9/9; basal subcostal crossvein present in all wings; triangles and subtriangles 2-celled in all wings, except for right FW, where triangle is free.

Abdomen (Figs. 1, 2a). Overall coloration black, with pale yellow markings on the following areas: lower lateral portions of S1−2, S1 with an almost vestigial tubercle; auricles olive green, bearing minute denticles on posterior margin; S3 with three triangular pale yellow spots, two laterally and one dorsally; S4−5 with a continuous pale yellow dorsal spot at its base; S6−7 with one dorsal spot on each side of the midline. Posterior hamuli black, stocky, with a broad hook, anterior portion bearing a pronounced ridge with a row of small teeth.

Anal appendages (Figs. 2e, 2h). Overall coloration black, pale yellow tips; an enlarged basal externo-lateral dilatation, bearing three-four large teeth (more visible in dorsal view), obliquely oriented; inferior carina of cercus slightly curved downwards, with a row of several minute blunt denticles. Epiproct forcipate, supero-external tooth acute, located at the medial portion of each forceps; tip of epiproct blunt and bifid.

Measurements (in mm). TL 39.6, AL 29.5, FW 24.6, HW 23.8, Pt 3.4.

Differential diagnosis. *Progomphus teolitavius* is closely related to three *Progomphus* species regarding structures of anal appendages orsecondary genitalia: *P. basistictus* Ris, 1911, *P. bidentatus* Belle, 1994, and *P. herrerae* Needham & Etcheverry, 1956 (See Fig. 2). From these species, *P. teolitavius* can be distinguished by the following character combinations (other species in brackets): in dorsal view (Fig. 2h), cercus bearing three large basal teeth [not seen from this angle on the aforementioned species, teeth small on *P. basistictus* (Fig. 2g) seen in lateral view]; inferior carina of cercus (Fig. 2e) slightly curved downwards [nearly straight in *P. basistictus* (Fig. 2g) and *P. herrerae* (Fig. 2f)]; supero-external tooth of epiproct acute (Fig. 2e), located at the medial portion of each forceps [smaller in *P. basistictus* (Fig. 2g), absent in *P. bidentatus* and apical in *P. herrerae* (Fig. 2f)]; tip of epiproct

branches blunt and bifid [larger on *P. basistictus* and *P. herrerae*, smaller on *P. bidentatus*]; each branch of epiproct bearing one medial tooth [two in *P. bidentatus*, none in *P. herrerae* and *P. basistictus*]; posterior hamuli stocky (Fig. 2a), with a broad hook [slender on *P. bidentatus* (Fig. 2d) and *P. herrerae* (Fig. 2b) and acute in *P. basistictus* (Fig. 2c)]; anterior portion of posterior hamuli bearing a pronounced ridge (Fig. 2a) with a row of small teeth [less pronounced ridge on the aforementioned species, Figs. 2b−d)].

Distribution and habitat. *Progomphus teolitavius* **sp. nov.** is only known from the type locality, a gallery forest within the Cerrado biome of Barroso, Minas Gerais state (Fig. 3). This is a lotic environment, which is the typical habitat of *Progomphus* species (Belle 1973; Garrison *et al*. 2006).

FIGURE 1. *Progomphus teolitavius* **sp. nov.** Holotype: habitus, and closeups of thorax and abdominal segments.

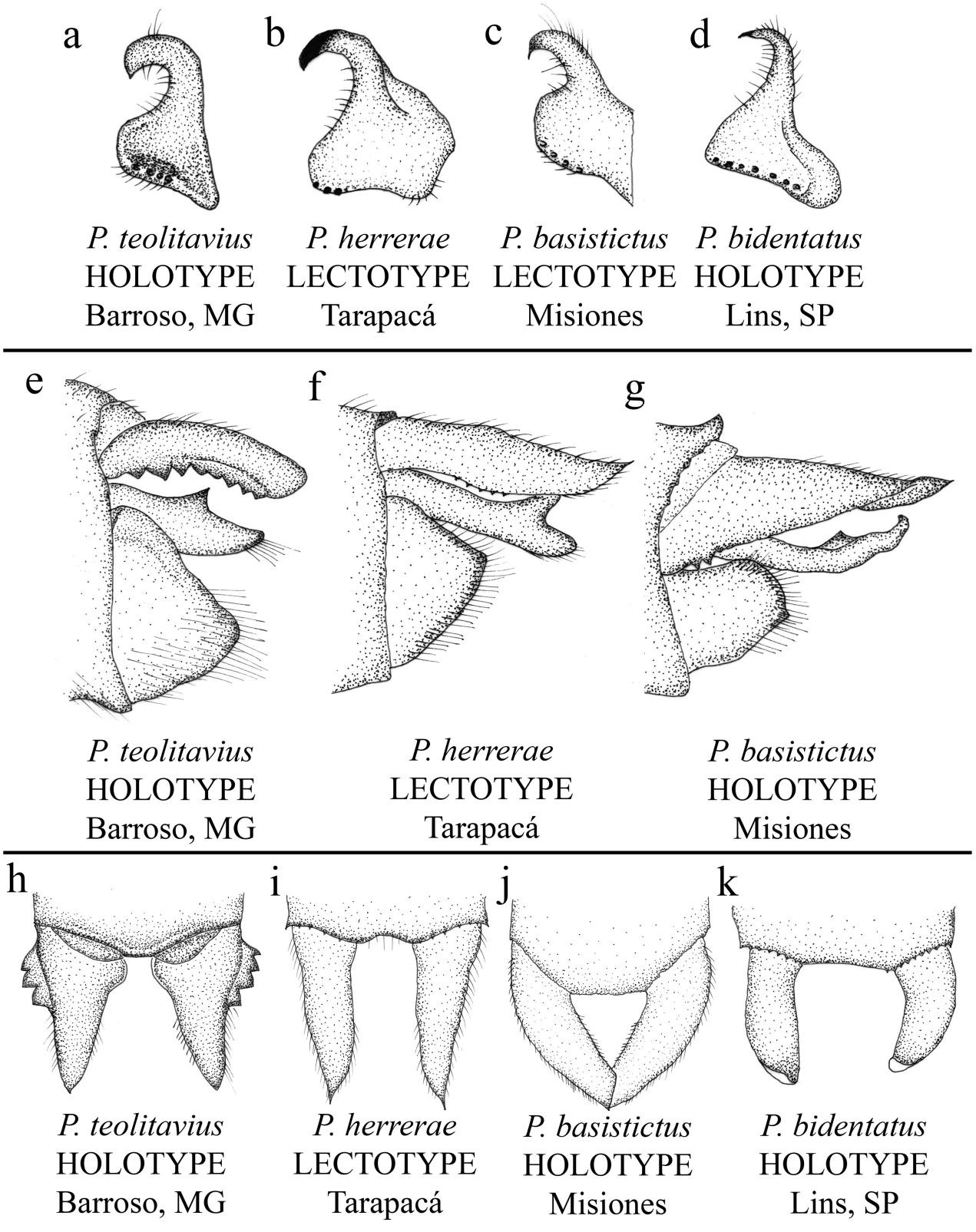

FIGURE 2. Ventral view of left posterior hamule of: (a) *Progomphus teolitavius* **sp. nov.** Holotype; (b) *P. herrerae* Lectotype; (c) *P. basistictus* Lectotype; (d) *P. bidentatus* Holotype. Lateral view of the anal appendages of: (e) *Progomphus teolitavius* **sp. nov.** Holotype; (f) *P. herrerae* Lectotype; (g) *P. basistictus* Holotype. Dorsal view of the anal appendages of: (h) *Progomphus teolitavius* **sp. nov.** Holotype; (i) *P. herrerae* Lectotype; (j) *P. basistictus* Holotype; (k) *P. bidentatus* Holotype. AR: Argentina, CHI: Chile, MG: Minas Gerais state, SP: São Paulo state.

FIGURE 3. Gallery forest within a Cerrado area from Barroso, Minas Gerais state: type locality of *Progomphus teolitavius* **sp. nov.**

Discussion

This is the 70th *Progomphus* species to be described and the first one 15 years after the last additions to the genus: *P. lambertoi* and *P. marcelae*, both by Novelo-Gutiérrez (2007a, b). Despite the large number of species described for the genus, this is only the eighth *Progomphus* species known to occur in Minas Gerais state, which has 323 odonate species recorded so far (Vilela 2022). Perhaps this Gomphidae undersampling in the state is due to the habits of the family itself, in which many species come near to the water only to mate, and tend to be quite difficult to catch through traditional netting capture (Almeida *et al*. 2013).

Furthermore, as our specimen was captured outside a protected area, our results highlight the importance of preserving threatened fragments of native gallery forests such as those from Barroso municipality. This is a region that holds several endemic populations of Odonata (Souza *et al*. 2013), and we consider it very important to encourage more surveys in those areas, which may reveal new records (and even other new species) for the state, thus helping us to better understand our odonatofauna.

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