

A new species of alderfly (Megaloptera: Sialidae) from Rio Grande do Sul, Brazil

by

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Abstract

Eight species of Neotropical alderflies (Megaloptera: Sialidae) have been previously described, three of which are from Brazil. In this paper, *Protosialis hauseri* (Megaloptera: Sialidae), a new species of alderfly from Floresta Nacional de São Francisco de Paula, Rio Grande do Sul, Brazil, is described and illustrated. Besides a characteristic color pattern of head and pronotum, the new species is distinct in genitalia, the male having a unique ninth sternum with a posteromedian projection and a pair of posterolateral lobes.

Keywords: *Protosialis*, Neotropics, Brazil, taxonomy.

Resumen

Ocho especies de siálidos Neotropicales (Megaloptera: Sialidae) han sido descritas previamente, tres de las cuales son de Brasil. En este artículo, *Protosialis hauseri* (Megaloptera: Sialidae), una especie nueva de Floresta Nacional de São Francisco de Paula, Rio Grande do Sul, Brasil, es descrita e ilustrada. Además de un patrón de color característico de cabeza y pronoto, la especie nueva se distingue en genitalia, teniendo el macho un particular noveno esterno con una proyección posteromedial y un par de lóbulos posterolaterales.

Introduction

The taxonomy of Neotropical alderflies had been dormant for several years. Eight species of Neotropical alderflies have been described (CONTRERAS-RAMOS 1999), all of them published more than 20 years ago. The proposal of a new species from Venezuela, which includes the redescription of *Protosialis brasiliensis* NAVÁS, is now under editorial review, so with the species herein described the current number of Neotropical alderflies is raised to 10. Also, the immatures of *Protosialis flammata* PENNY have recently been described with life history notes (AZEVEDO 2003). Nonetheless, the group still demands considerable attention. Redescription of former species, as well as new distribution data are under preparation and will be presented

elsewhere. Female specimens from various localities in South America indicate more currently undescribed species.

Material and methods

Specimens are preserved in ethanol. Dissection followed standard procedures as explained in CONTRERAS-RAMOS (1998). Male and female genitalia are preserved in genitalia vials with glycerin. Venational and morphological terminology follows GLORIOSO (1981) and CONTRERAS-RAMOS (1998). Specimens will be returned for permanent placement to Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul (MCNZ), Porto Alegre, Brazil. Of the eight described species of Neotropical Sialidae, type specimens of *Protosialis flavicollis* (ENDERLEIN) and *P. nubila* NAVÁS, have not been located. The type of *P. bimaculata* BANKS is at the Museum of Comparative Zoology, Harvard University. Specimens of *Protosialis bifasciata* (HAGEN), *P. brasiliensis* NAVÁS, *P. chilensis* (MACLACHLAN), *P. flammata* PENNY, and *P. mexicana* (BANKS), as well as of the new species from Venezuela under review, have been studied.

Results

Genus *Protosialis* WEELE, 1909

Usage and maintenance of this Neotropical genus has been rejected (ROSS 1937), supported (PENNY 1981), or questioned (WHITING 1994). In this paper, *Protosialis* is used, although it is recognized that its taxonomic status is problematic. An eversible sac between the 9th and 10th sternites of the male abdomen may be a defining character (WHITING 1994). However, a thorough revision of the genus, and of the family at the genus level, might be necessary in order to elucidate the validity of *Protosialis*.

Protosialis hauseri CONTRERAS, FIORENTIN & URAKAMI, new species (Figs. 1-7)

Holotype, male (MCNZ): Brazil, Rio Grande do Sul, Floresta Nacional de São Francisco de Paula, 29°02'S, 50°23'W, 930 m, 17.viii.2003 (larva collected) - 20.ix.2003 (adult emerged in laboratory), leg. Y. URAKAMI & G.L. FIORENTIN.

Paratype: Same locality, dates, and collectors, 1 female (MCNZ).

Diagnosis. This new Brazilian species is easily separated from the new Venezuelan species because the latter one has a uniform orange-brown color on the head, whereas the Brazilian species has a wide median-longitudinal band (Fig. 1). Other species with a patterned head, such as *Protosialis bimaculata* BANKS, from Bolivia; *P. flammata* PENNY, from Amazonas, Brazil; and *P. mexicana* (BANKS), from Mexico and Central America, have a different pattern (e.g., a dark mark behind the eye). *Protosialis bifasciata* (HAGEN), from Cuba, has a pair of wide longitudinal bands on the head; while *P. chilensis* (MACLACHLAN), from Chile, has a pattern of irregular black spots on the head, and a distinct male genitalia with an attenuate 9th sternum lacking posterolateral lobes. The ninth sternum in the new species is short, rectangular, with a postero-medial projection and a pair of posterolateral lobes (Figs. 3-5). The original description of *Protosialis flavicollis* (ENDERLEIN, 1910), from Colombia, does not match generally with the new species. It has a different coloration, with darker head and palps, paler pronotum and wings, and is slightly larger (i.e., forewing length of female holotype = 14.5 mm, forewing length of female paratype of the new species = 13.0 mm). Moreover, ENDERLEIN emphasized bizarre tarsal claws in his species, with a basal dentiform protrusion, which is only slightly developed in the new species. Of the two remaining described species, both from Brazil, the type of *P. brasiliensis* NAVÁS has been

studied. The head of the latter has a broader dark area, which approaches the eyes, as well as a darker genal area and pronotum. *Protosialis nubila* NAVÁS has a quite general description, in Latin. Furthermore, locality data are imprecise: "...Matto Grosso? (no se lee bien),..." (NAVÁS 1933, p. 37). However, about the head NAVÁS did specify (p. 36) "... *macula ferruginea* laterali pone oculos, introrsum angustata...", putting *P. nubila* similar to species with a spot around and behind the eye, such as *P. mexicana*, which rules out the new species.

Etymology: We are honored to dedicate this species as a modest homage to Prof. Dr. Josef HAUSER, S.J. (1920-2004), who was born in Hungary, became in 1954 a distinguished member of the academic community in São Leopoldo, and later a Brazilian citizen as well. Prof. HAUSER, founder of the Sociedade Brasileira de Zoologia, was widely recognized as a genuine scientist and will be remembered as one of the major histologists of Brazil.

Description. Forewing length, 12 mm(male) - 13mm (female). Overall color fuscous. Head pale orange, dorsally with median longitudinal fuscous band (Fig. 1), which expands transversely on anterior end, less well defined posteriorly, with two narrow, smoother, paler bands; labrum and clypeus fuscous; antennae black, terminal segments slightly paler, 36-segmented in male, pilose; head ventrally pale orange, except gular region and mouthparts brownish; mandibles reduced, concealed underneath labrum, base with long setae similar to labrum and clypeus; maxillary and labial palps 4- and 3-segmented, respectively.

Pronotum dark orange with small brownish spots, each lateral half widely margined with brown, pilose; metanotum nearly black. Legs uniformly dark brown, except male with paler hind legs; tarsal claws pale brown. Forewing (Fig. 2) fuscotestaceous, semitranslucent, elongate-subrectangular, costal area enlarged, with 9-12 crossveins, several curved or oblique; three crossveins between R_1 and R_s , the latter with two branches, both forked, second one appearing independent from anterior branch; three r-m crossveins.

Male genitalia unique; 9th tergum short, dorsally more developed but directed posteroventrally (Figs. 3, 4); 10th tergites reduced, apparently absent (Fig. 3); tenth sternite as a pair of sclerotized tubes, curved, developed ventrally and anterodorsally (Fig. 3), setose, forming a sclerotized canal appearing to contain anal tubercle; membrane between ninth and tenth sternite missing in specimen, thus undetermined whether developed and eversible; 9th gonostyli reduced, apparently plate-shaped (Figs. 3, 4); 9th sternum short, with digitiform median projection and pair of posterolateral lobes, sparsely setose, with ventral fringe of setae (Figs. 3-5).

Female genitalia with 7th abdominal sternum lightly sclerotized, except for blunt posteromedian process; 8th sternum with single sclerotized plate (Figs. 6, 7), subrectangular in ventral view (Fig. 6), actually convex forming a semicanal caudally, concealed by base of ovipositor and rest of 9th segment.

Discussion and variation. The first flagellar segment is noticeably longer in the male antenna, about 4 times longer than the remaining flagellomeres; however, in the female the corresponding segment is only slightly longer, about 1.5 times as long as other flagellomeres. It is unknown whether this is a fixed character for the male, or only variation due to, for instance, an abnormal molting process. In the female specimen, maxillary and labial palps each has a conspicuous apical sensory area, nearly appearing as a small segment, but the corresponding area is less developed in the male. The

labium appears to have a small, spongy, and slightly tubular portion, apically, which speculatively might help suck fluids and appears to be more conspicuous in the female. Male genitalia in this species are unique because of the shape of the 9th sternum, but particularly because of the sclerotized, setose, double structure that forms a canal attached to the 9th tergum, which might correspond to the 10th sternite. This canal, dorsally, seems to receive the apex of the median projection of the 9th sternum.

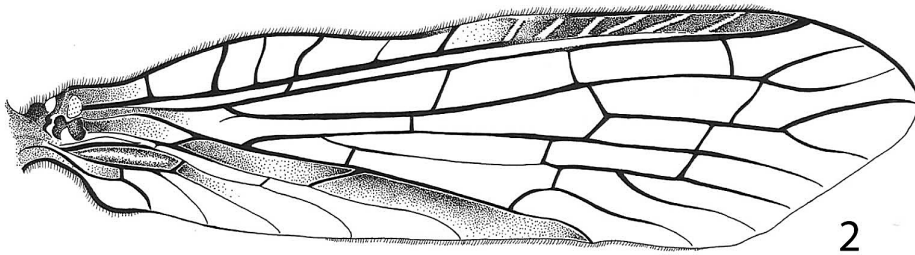
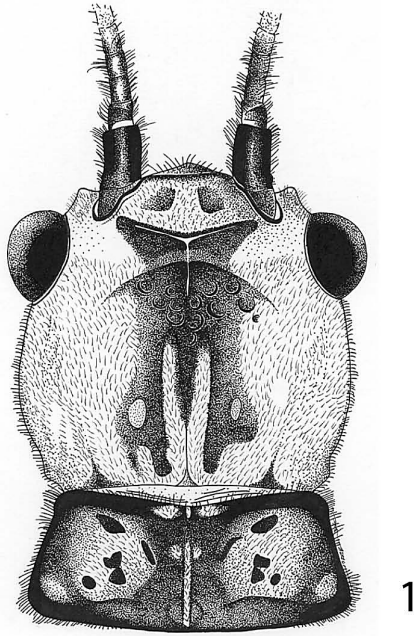
Distribution and biology. This new species is known only from Floresta Nacional de São Francisco de Paula (FLONA), Rio Grande do Sul, located between 29°23'S and 29°27'S, and 50°23'W and 50°25'W, with an area of 1606.60 ha, at 930 m of elevation. The climate is of type "cfbl", temperate with a mean annual temperature of 18.5 °C, mean precipitation of 2468 mm, and dominant winds from NE and N. It is a mixed subtropical forest of Araucaria, which establishes a contact zone between the Atlantic, Araucaria, and Subtropical Rain Slope Forests, fitting generally within the Paraná Province, Pine District of CABRERA & WILLINK (1973). Larvae of the new species were collected from a small stream on August 17, 2003, and 14 days later in the laboratory larvae sought a dry medium to initiate pupation. They lasted as pupae for 20 days, and the male and female adults emerged on September 20, 2003.

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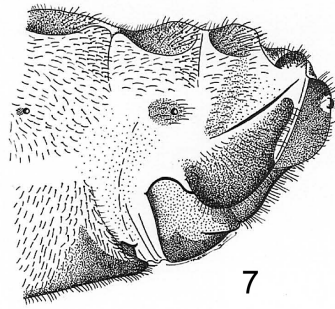
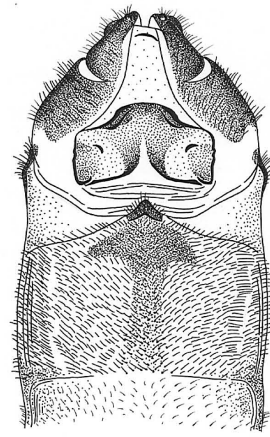
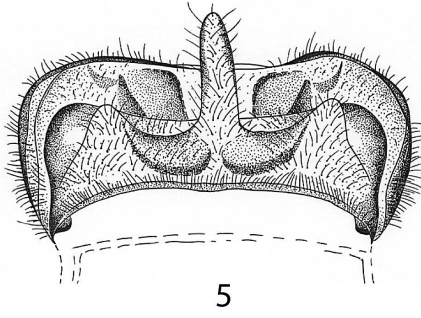
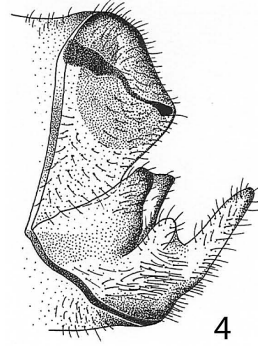
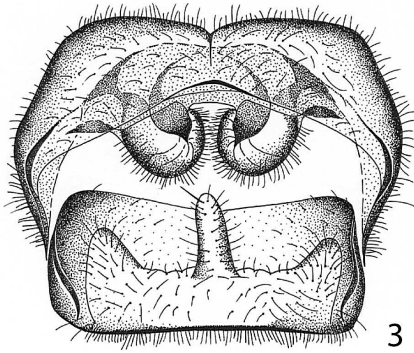
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Figs. 1-2:

Protosialis hauseri, n.sp.; 1: head and pronotum, holotype; 2: right forewing, paratype.



Figs. 3-7:
Protosialis hauseri, n.sp.; 3: male genitalia, caudal; 4: same, lateral; 5: same, ventral; 6: female genitalia, ventral; 7: same, lateral.