

A New Genus of Atalophlebiinae (Ephemeroptera: Leptophlebiidae) from Northern South America

by

Harry M. SAVAGE and Eduardo DOMINGUEZ

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A new genus of Neotropical Atalophlebiinae, *Paramaka convexa* comb.n., is established for the species *convexus* Spieth which was originally described in the Old World genus *Thraulius* Eaton. *Paramaka* is monotypic and currently known from Surinam and the Pará State of Brazil. *Paramaka* is a member of the *Hermanella* Generic Complex but can be separated from all other members of the *Hermanella* Complex by three autapomorphies in male adults. The female adults and nymphal stages remain unknown.

H.M. SAVAGE, Department of Entomology, Florida A & M University, Tallahassee, Florida, 32307, U.S.A. Current address: Medical Entomology and Ecology Branch, DVVID, CDC, P.O. Box 2087, Ft. Collins, CO 80522-2087, U.S.A.

E. DOMINGUEZ, CONICET - Facultad de Ciencias Naturales, UNT, Miguel Lillo 205, 4.000 Tucuman, Argentina.

INTRODUCTION

Although recent systematic studies on the Leptophlebiidae of northern South America (Savage 1982, 1986, 1987a, b; Savage and Peters 1982; Dominguez and Savage 1987; Dominguez 1986, 1988; Dominguez and Flowers 1989) have greatly increased our knowledge of this fauna, the taxonomic status of a number of Neotropical species originally described in the Old World genus *Thraulius* Eaton remains confused. In this paper and several that follow, the authors will treat each Neotropical species that remains incorrectly placed in *Thraulius*.

Thraulius convexus Spieth was originally described based upon two male imagines from Surinam (Spieth 1943). Subsequently, Traver (1960) transferred *convexus* Spieth to *Homothraulius* Demoulin, a genus established (Demoulin 1955) for another species originally described in *Thraulius*. Recent research by the authors indicates that *convexus* Spieth is not a member of *Homothraulius* nor of the *Homothraulius* Generic Complex. Indeed, revisionary and phylogenetic studies (Dominguez and Flowers 1989; Flowers and Dominguez, 1991) indicate that *convexus* Spieth is a member of the *Hermanella* Generic Complex. The *Hermanella* Generic Complex currently includes 5 genera, *Hermanella* Needham and Murphy, *Traverella* Edmunds, *Leentvaaria* Demoulin, *Hylister* Dominguez and Flowers, and *Needhamella* Dominguez and Flowers. The adult and nymphal stages of all five genera are known except for the adults of *Leentvaaria* which remain unknown. The species, *convexus* Spieth, differs significantly from all established

genera known from the adult stage, possesses several autapomorphies and cannot be placed in any existing genus without drastic alteration of accepted generic concepts. Because this species differs significantly from all established genera we herein establish the genus *Paramaka* for *convexus* Spieth, *Paramaka convexa* comb.n. However, the possibility remains that *Paramaka* represents the unknown adult of *Leentvaaria*.

In the descriptions that follow, fore leg ratios, body length measurements, and other character terminology follows Savage (1987a).

Paramaka gen. n.

Male imago. Length: body, 6.50-7.50 mm; fore wings, 8.25-8.33 mm; hind wings, 1.5-1.7 mm. Eyes meet on meson of head, in lateral view lower portion 2/5 length of upper portion. Prosternum with a narrow, straight, median carina (Fig. 4). Wings (Figs. 1-3): maximum width of fore wings 1/3 to 2/5 length of fore wings; maximum width of hind wings 3/5 maximum length of hind wings; maximum length of hind wings 1/5 maximum length of fore wings. Fore wings (Fig. 1): vein Rs forked slightly less than 1/5 distance from base of vein to margin, fork symmetrical; vein MA forked slightly less to slightly more than 1/2 distance from base of vein to margin, fork asymmetrical, vein MA₂ recurved; vein MP forked slightly less than 2/5 to 2/5 distance from base of vein to margin, fork asymmetrical; vein ICu₁ attached at base to vein CuA by a crossvein; 120-140 crossveins; marginal intercalaries numerous along posterior margin. Hind wings (Figs. 2-3): costal projection well developed, apex rounded, acute, base of projection wide, apex located slightly less than 1/2 distance from base to apex of wing; vein MP not forked; apex of wing rounded, acute; vein Sc terminating at crossvein slightly less than 1/2 distance from base to apex of wing, 10-12 crossveins. Legs: ratio of segments in fore legs, 0.64: 1.00 (2.57 mm): 0.024: 0.31: 0.29: 0.16: 0.09. Claws of a pair dissimilar, one hooked apically, other pad-like (Fig. 5). Male genitalia (Figs. 8-10): maximum length of styliiger plate 0.36 maximum width (0.48 from posterior view); styliiger plate with a median ridge continuing beyond the posterior margin to form a sharp projection that curves dorsally and projects between the penes; forceps sockets oval, except ventral margin developed medially (Fig. 9); forceps segment 3 conical, 1/3 to 2/5 length of segment 2; segment 2 rectangular, 1/4 length of segment 1; segment 1 increasingly wider basally, mesal angle smooth without sharp basal expansion; basal 1/3 of penes fused, apical 2/3 divided, apex of each penis rounded with a mesal spine-like appendage, appendages directed anteromesally and cross at distal point of fusion of penes. Caudal filaments: length approximately 2.2 times body length.

Female Imago and Nymph: unknown.

Etymology: *Paramaka*, a group of Maroons that reside in Surinam and French Guiana; feminine.

Type Species: *Paramaka convexa* (Spieth) comb. n.

Discussion. Male imagines of *Paramaka* can be distinguished from the imagines of all other genera of Leptophlebiidae by the following combination of characters: 1) fork of vein MA and fork of vein MP in fore wings asymmetrical (Fig. 1); 2) fore wing with slanting crossvein present above fork of MA; 3) vein ICu₁ attached at base to CuA by a crossvein; 4) hind wings with costal projection well developed, acute (Figs. 2-3); 5) vein Sc of hind wings terminates into a crossvein and ends slightly less than 1/2 distance base to apex of wings; 6) vein MP of hind wings not forked; 7) claws of a pair dissimilar, one hooked apically, other pad-like (Fig. 5); 8) basal 1/3 of penes fused, apical 2/3 divided; 9) penes each with a mesal spine-like appendage which is directed anteromesally (Figs. 8-10); 10) styliger plate with median ridge that projects dorsally between penes (Figs. 8-10); and 11) ventral margin of forceps sockets medially developed (Fig. 9).

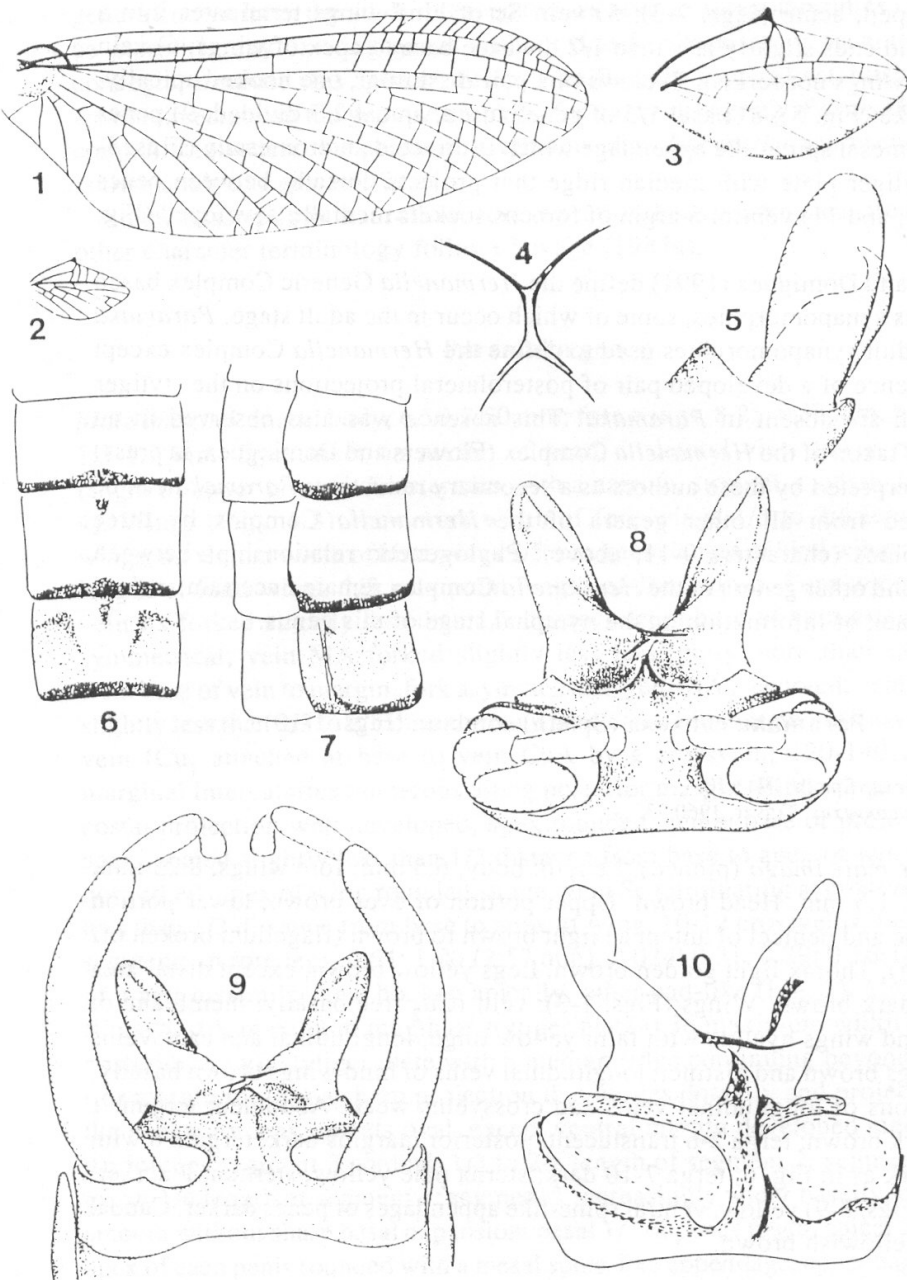
Flowers and Domiguez (1991) define the *Hermanella* Generic Complex based on numerous synapomorphies, some of which occur in the adult stage. *Paramaka* shares all adult synapomorphies used to define the *Hermanella* Complex except for the presence of a developed pair of posterolateral projections on the styliger plate, which are absent in *Paramaka*. This absence was also observed in an undescribed taxon of the *Hermanella* Complex (Flowers and Dominguez, in press) and was interpreted by these authors as a secondary reduction. *Paramaka* can be distinguished from all other genera of the *Hermanella* Complex by three autapomorphies (characters 9-11, above). Phylogenetic relationships between *Paramaka* and other genera of the *Hermanella* Complex remain uncertain, mainly due to the lack of information on the nymphal stage of this genus.

***Paramaka convexa* (Spieth) comb. n. (Figs. 1-10)**

Thraulius convexus Spieth, 1943:10.

Homothraulius convexus, Traver, 1960:73.

Holotype male imago (pinned). Length: body, 6.5 mm; fore wings, 8.25 mm; hind wings, 1.5 mm. Head brown. Upper portion of eyes brown, lower portion black. Scape and pedicel of antennae light brown to brown (flagellum broken off and missing). Thorax light golden brown. Legs yellow brown, except distal area of femora dark brown. Wings (Figs. 1-3): vein ICu₂ free basally; membrane of fore and hind wings hyaline with faint yellow tinge, longitudinal and crossveins of fore wings brown and distinct; longitudinal veins of hind wings brown basally, distal portions of longitudinal veins and crossveins weak. Abdomen: tergum 1 entirely dark brown; terga 2-6 translucent, posterior margins dark, tergum 6 with median mark as in Fig. 6; terga 7-10 dark; sterna pale yellow, sternum 9 darker. Genitalia (Figs. 8-9) yellow, ventral spine-like appendages of penes darker. Caudal filaments yellowish brown.



Figs. 1-10. *Paramaka convexa* comb.n., male imago: 1, fore wing; 2, hind wing; 3, hind wing enlarged; 4, median carina of prosternum; 5, fore claw; 6, abdominal terga 5-7; 7, abdominal segments 5-7, lateral view; 8-10, genitalia, 8 - posterior view, 9 - ventral view, 10 - ventrolateral view with forceps removed.

Female imago and nymph: unknown.

Material: Holotype male imago, pinned; SURINAM: Gran Soela, at junction of Litani and Lawa rivers, July 9, 1939, D.C. Geijskes (American Museum of Natural History); and Paratype, 1 male imago, pinned (not examined), same data as holotype. Additional material, one male imago, BRAZIL: Pará St., Rio Xingu, camp (52° 22' W: 3° 39' S) ca. 60 km S. Altamira, Igarape Jabuti, X-8-16-1986, P. Spangler and O.S. Flint, Jr. (National Museum of Natural History).

Discussion. In the original description, Spieth (1943) interpreted the first tarsal segment as being part of the tibia, and therefore he counted only 4 tarsal segments. He also described the cross venation as sparse and distinct; however, the crossveins are relatively abundant in this species when compared to other Leptophlebiidae.

In addition to the holotype, we had the opportunity to study one male imago that was preserved in alcohol. This specimen differs from the holotype in the following characters: body length, 7.4-7.5 mm; fore wings, 8.3-8.35 mm; antennae light brown, paler toward apex of flagellum; general coloration lighter. The paler coloration of this specimen surely reflects the different type of preservation. Except for Figs. 4, 6-7 and 10, all drawings were made from the holotype.

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