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# NOVOS TAXA ENTOMOLÓGICOS

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## New Transvaal Leptophlebiid (Ephem.)

by

J. D. AGNEW

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INSTITUTO DE INVESTIGAÇÃO CIENTIFICA DE MOÇAMBIQUE  
LOURENÇO MARQUES

# NEW TRANSVAAL LEPTOPHLEBIID (EPHEM.)

by

J. D. Agnew

(National Institute for Water Research, P. O. Box 395, Pretoria, South Africa)

(Rec.: Novembro de 1961)

## INTRODUCTION

Imagines of the new species described below were obtained by breeding out the nymphal stages in the laboratory. The catalogue numbers, in the National Institute for Water Research, of the material used for this paper are as follows:

- |                 |  |
|-----------------|--|
| GEN 723E .....  | Holotype ♂ imago plus subimaginal and nymphal remains. |
| GEN 723F .....  | Allotype ♀ imago plus subimaginal and nymphal remains. |
| GEN 723 G ..... | Paratype ♀ subimago plus nymphal remains.              |
| GEN 719D .....  | Nymphal stages (3) partly dissected.                   |

The slides with microscope mounts taken from the above material are numbered 165-176. Descriptions are based on fresh specimens preserved in 70 % ethanol.

\* \* \*

### *ADENOPHLEBIODES (ADENOPHLEBIODES) MASONELLA* N. SP.

*Diagnosis.* — ♂ imago: Turbinate eyes dull orange, subcircular in dorsal view, almost contiguous. Basal eyes brownish grey. Ocelli opaque whitish, ringed with black. Antennal base dark, flagella colourless.

Pronotum and thoracic dorsum pale with white and darker patches and light castaneous sclerites. Legs colourless but dorsal and ventral surfaces of femora with dark suffusions, centrally and apically. Abdominal segments pale with light sienna pattern, as illustrated. Segment VIII dorsally with longitudinal white stripes, IX and X mottled white and brownish. Forceps light brown basally, terminal lobes pale. Penis lobes colourless, genitalia further as illustrated. Cerci and median filament lost in holotype male. Wings as illustrated for ♀, hyaline with light brown patches. Costal area somewhat milky, more so distally.

Length 8.5 mm., forewing 8.8 mm.

♀ imago: Head dominantly flat white, with black and dark brown patches. Eyes light brownish-grey, set at posterolateral corners of head. Ocelli opaque white ringed with black. Antennal base dark, flagella colourless. Thorax dorsally pale with light castaneous sclerites but laterally with darker markings. Legs pale with dark suffusions centrally and apically on femora, and subterminally on tibiae. Wings as illustrated, with some milkiness distally in the costal area. Abdomen more robust than in ♂, with pale background colouration, and brown pattern more fully developed than in ♂. Some white markings on last four abdominal segments. Abdominal sternites with clear dark markings centrally and laterally in the anterior half of each segment. Subanal plate triangular with concave apex, as illustrated.

Length 8.5 mm., forewing 10 mm.

Nymph: General fascies very similar to that of the nymph of *A. bicolor* (CRASS) described by CRASS (1947). Overall colour of dorsal side light ochraceous yellow with some darker markings. Underside whitish. Head light with very light brown patches. Antennae colourless. Mouthparts as illustrated. Pronotum and thorax light, with some darker suffusions, especially at region of leg attachments. Pronotum with bristles at anterior edge. Legs whitish. Dorsal surface of femora with very slight suffusion centrally and just before tibial joint. Tibiae with two darker stripes near apex. Tarsi and claws very pale yellowish. Claw as illustrated with ca. 25 fine (proximally) to somewhat coarser (distally) denticulations. Abdominal segments dorsally with clear median stripe and distinctive colour pattern as illustrated. Abdominal segments VII-IX laterally unia acuminate. Cerci and median filament uniform pale yellowish, setose at nodes. Gills six in number, attached at anterolateral corners of first six abdominal segments. First gill single, largest, oval, concave and acting as a cover for most of the following gills; when closely applied to the side of the abdomen reaching very nearly to the end of segment V; apex of first gill not excised,

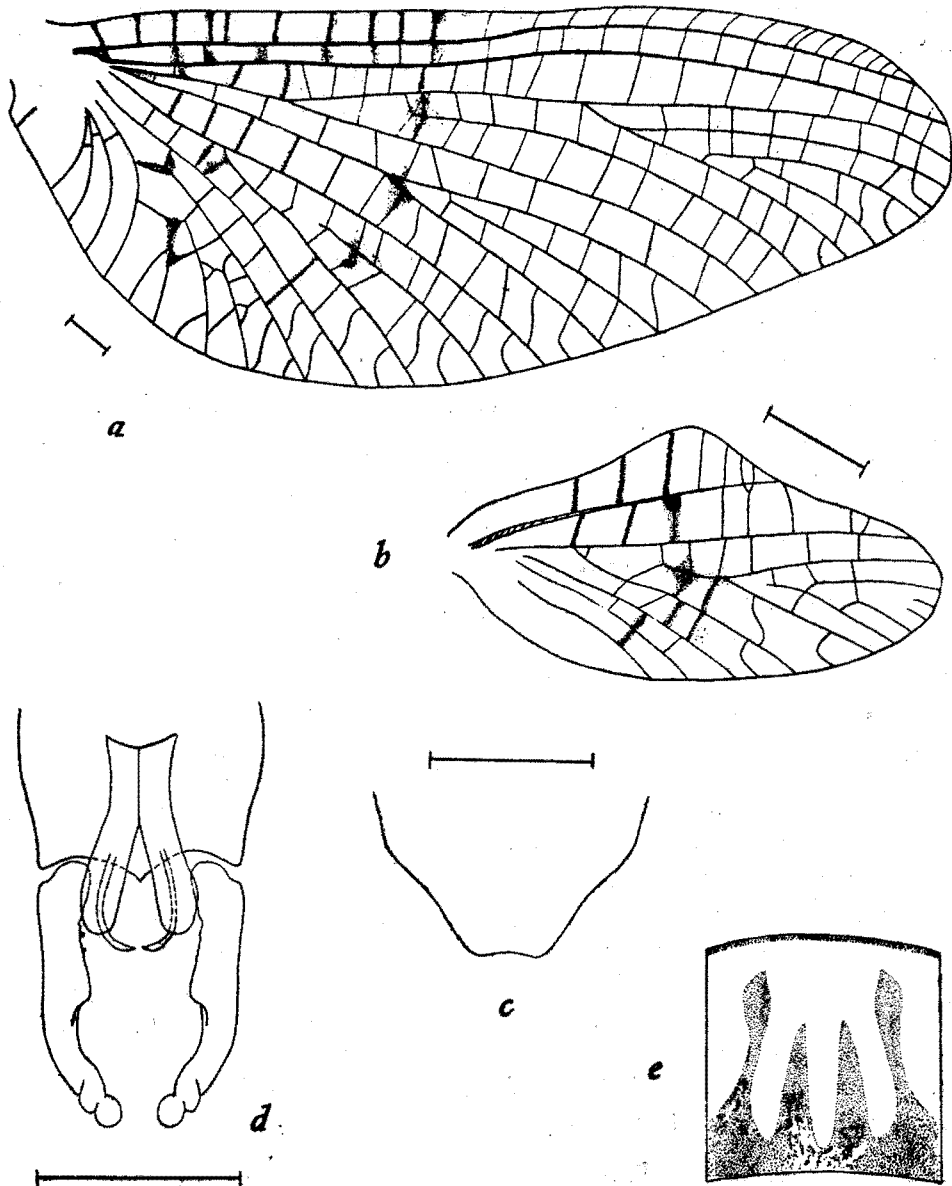


Fig. 1 — *Adenophlebiodes masonella* n. sp. — a-c, ♀ imago; d-e, ♂ imago  
 a, forewing; b, hindwing; c, subanal plate; d, genitalia; e, dorsal abdominal pattern  
 (Scale = 0.5 mm.)

sparsely fringed with fine hairs, of a granular light brown appearance, with no distinct tracheation. Gills 2-5 double, lying almost in a vertical plane, with inner lamella larger than outer lamella and without hairs. Lamellae apically excised. Inner (larger) lamella of 2nd gill with very slight basal extension on upper half; inner lamella of 3rd gill with symmetrical pointed rather transparent basal extension on upper half; 4th, 5th and 6th gills similar to 3rd gill but each gill becoming progressively smaller than the previous one. Inner lamella of 6th gill only very slightly apically excised. Smaller outer lamellae of all gills without basal extensions: extensions on inner lamellae unilateral. Length 10 mm., median filament broken off at 15 mm. but probably ca. 20 mm., cerci broken but probably same length as median filament, antennae 5.5 mm., wing-pad length 3.8 mm.

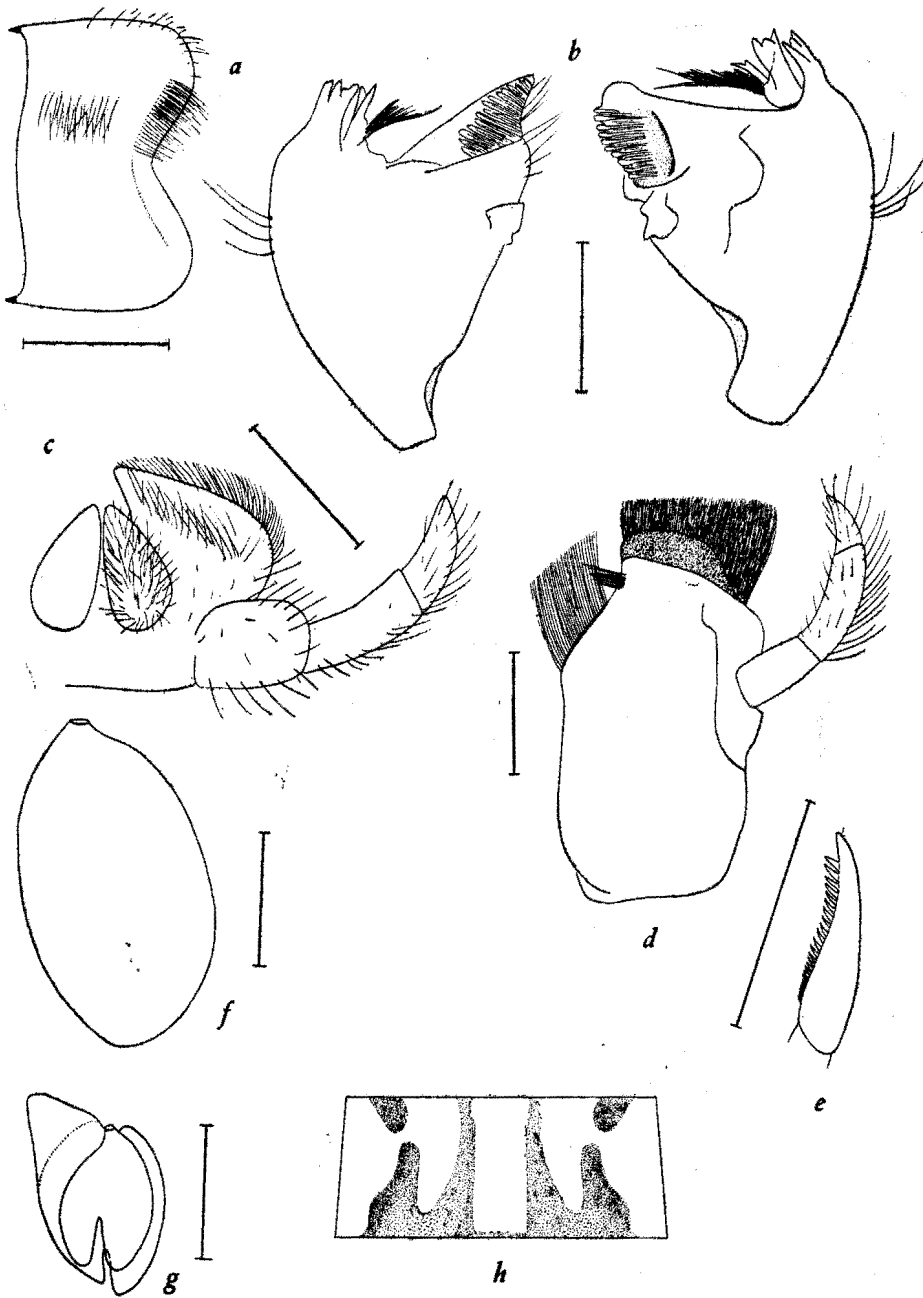
*Taxonomic discussions.* — DEMOULIN (1955) has divided ULMER's genus *Adenophlebiodes* into two subgenera: *Adenophlebiodes* s. str. («Aile 11 et moitié basilaire de l'aile 1 ... ornées de bandes et taches foncées plus ou moins anastomosées») and *Hyalophlebia* («À l'aile 1, la membrane est incolore»). The new species described above would therefore fall into *Adenophlebiodes* s. str. The nymphal stages of this genus have received little attention in the literature, and so far only two correlated nymphs have been described, i. e. the nymph of *A. (A.) bicolor* (CRASS) and the nymph of *A. (H.) patriciae* AGNEW. The result is that DEMOULIN's subgeneric division has had no support from a study of nymphal morphology.

In a previous paper (AGNEW, in press) it was suggested that only the claw structure in nymphs might be of importance in indicating to which subgenus a specimen belongs. I was influenced in making this suggestion by DEMOULIN's (1956) description of an unspecified nymph which he named «*Adenophlebiodes* (? *Hyalophlebia*) sp., larve». He had tentatively suggested subgenus *Hyalophlebia* for this nymph because «des ailes subimaginales ébauchées dans les ptérothèques mésothoraciques ne montrent aucun indice d'une teinte plus foncée dans la moitié basilaire que dans la moitié distale». His nymph, however, has only six gills, which is also the case with nymphs of *A. (A.) bicolor* and *A. (A.) masonella*, whereas the only definitely correlated nymph belonging to *Hyalophlebia* (that of *A. patriciae*) has seven gills.

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Fig. 2 — *Adenophlebiodes masonella* n. sp. — Nymph

a, clypeus; b, mandibles to same scale; c, labium; d, maxilla; e, claw; f, first gill;  
g, fourth gill; h, dorsal abdominal pattern (segment VII), schematic  
(Scale = 0.5 mm.)



If gill number is correctly related to subgenus, then DEMOULIN's nymph cannot possibly belong to *Hyalophlebia*, although it is difficult to explain why the developing wings showed no signs of colouration. There is therefore now some evidence to suggest that nymphs of *Adenophlebiodes* s. str. have six gills with an operculiform first gill that is not apically excised, whereas those of *Hyalophlebia* have seven gills with a non-operculiform, apically excised first gill. The condition in *Adenophlebiodes* s. str. could have been derived from that of *Hyalophlebia* by loss of the last gill accompanied by further development of the first gill as a protection for the remaining gills, perhaps in response to some environmental factor (cf. the shortening of the anterior abdominal segments to achieve the same purpose in the nymph described by DEMOULIN). It is likely that annectent forms between these two subgenera await description. The species described above may easily be separated from the other two known Southern African species by means of the key given below:

#### Imagines:

- |   |                          |   |
|---|--------------------------|---|
| 1. Wings completely hyaline and clear ..... | <i>A. (H.) patriciae</i> |   |
| Wings with dark areas or suffusions .....   |                          | 2 |
| 2. Basal half of forewing dark .....        | <i>A. (A.) bicolor</i>   |   |
| Forewing with discrete suffusions .....     | <i>A. (A.) masonella</i> |   |

#### Nymphs:

- |  |                          |   |
|--|--------------------------|---|
| 1. Gills on abdominal segments I-VII .....                       | <i>A. (H.) patriciae</i> |   |
| Gills on abdominal segments I-VI .....                           |                          | 2 |
| 2. Smaller lamellae of gills (II-VI) with basal extensions ..... | <i>A. (A.) bicolor</i>   |   |
| Smaller lamellae of gills (II-VI) without basal extensions ..... | <i>A. (A.) masonella</i> |   |

*Locus typicus.* — Small stream in Rustenburg Kloof, 6.5 km. S.W. of Rustenburg, Western Transvaal. 23-x-1961 and 26-x-1961.

*Ecological notes.* — Nymphs of this species cling to the undersides of stones in quiet pools where there is no appreciable current. Analysis of the water showed a dissolved solids content of 25 p.p.m. and a laboratory *pH* reading of 6.5. Field *pH* measurements would probably be somewhat lower than this as the water flows off very pure quartzitic rocks of the Magaliesberg range (Pretoria series) and is unbuffered. CHOLNOKY (1957) has made a study of the algal flora of streams in this area, and gives much valuable information on the ecology of the algal associations and their

relation to *pH* changes. In the laboratory, subimagines spent a full day in this stage before the final ecdysis. Nymphs seem to ecdyse into subimagines either during the night or very early in the morning.

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