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Description of *Micramphiops* gen.n. from Madagascar (Coleoptera: Hydrophilidae)

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Abstract

Micramphiops newtoni, a new genus and species of Hydrophilidae (Coleoptera), is described from Madagascar and assigned to the tribe Chaetarthriini. The type series was collected from sifting leaf litter, suggesting the species may be at least temporally terrestrial.

Key words: Coleoptera, Hydrophilidae, Chaetarthriini, Madagascar, leaf litter, wing polymorphism.

Introduction

On a recent visit to the Field Museum (FMNH; Chicago, USA), I came across a series of Malagasy specimens that had been labeled as a putatively new genus of the hydrophilid tribe Chaetarthriini by Dr. Alfred F. Newton. Subsequent examination confirmed that the material did indeed represent a curious new lineage within the tribe which is described herein.

Material and Methods

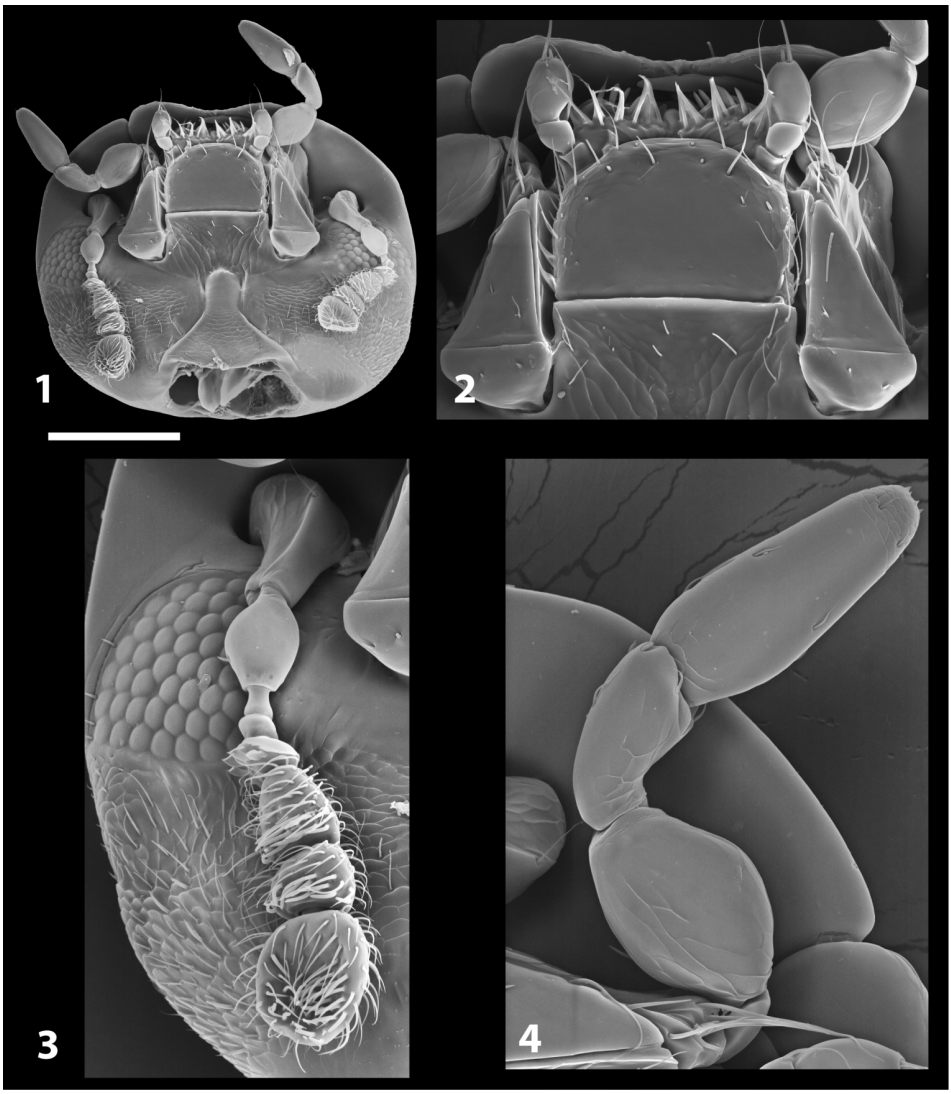
All specimens were examined using a binocular Wild M-5 microscope to 100 × magnification. Measurements were taken with the aid of an ocular micrometer. Scanning electron micrographs are all of a disarticulated male specimen in which the various parts were mounted on carbon tape and coated in gold. Drawings were made with the assistance of an ocular grid, camera lucida, and digital photographs. Terminology largely follows HANSEN (1991), except that meso- and metasternum have been replaced by meso- and metaventrite, respectively.

Micramphiops gen.n.

TYPE SPECIES: *Micramphiops newtoni* sp.n.

DIAGNOSIS: Size very small (body length less than 2.0 mm). Form extremely convex. Antennae 8-segmented, scape not elongated. Gula well-developed. Eyes completely divided into dorsal and ventral parts by lateral extension of the frons. Tibiae without swimming hairs. First abdominal ventrite sharply carinate and without fringe of long setae. All laterosternites extended ventrally beyond the plane of the abdominal ventrites.

DESCRIPTION: Head: Antennae (Fig. 3) with eight segments, including 3-segmented pubescent club; scape short, slightly shorter than the length of the stipes and only slightly longer than the pedicle. Maxillary palps short, ca. 2/5 width of the head; apical segment almost twice as long as penultimate segment. Second (pseudobasal) segment swollen. Mentum subquadrate, with anterior margins evenly rounded; surface smooth except for a few setae set around the lateral and anterior margin. Gula well-developed and sharply defined (Fig. 1). Lateral canthus of the frons extending across the eye and fused with the back of the head, giving each eye a divided appearance. Eyes not bulging, in the same plane as the surface of the frons. Clypeus and frons with systematic punctures.



Figs. 1–4: *Micramphiops newtoni*; 1) head, ventral view, scale bar = 0.2 mm; 2) detail of mentum and surrounding structures; 3) detail of antenna; 4) detail of maxillary palp.

Thorax: Pronotum and elytra with a few systematic punctures, but widely dispersed such that they do not appear in rows. Prosternum very short and carinate medially. Elytra without sutural striae or rows of serial punctures; margin smooth, not serrate. Mesoventrite appearing completely to almost completely fused with anepisternum such that the anapleural sutures are no longer visible. Metaventrite raised in median third (Fig. 6); the raised area itself with a central, rounded, sharply depressed region. All tarsi with five segments. Protarsi sexually dimorphic, male protarsus modified with circular discs on basal tarsomeres. Mesocoxae transverse. Meso- and metafemora with only a few, very sparsely distributed hairs on their ventral face (Figs. 7–8). Mesofemora with deep grooves for the reception of the mesotibiae. Hind wing without anal lobe;

r-m vein present, but weakly pigmented, arising from the basal half of the anteromedial pigmented area along wing margin.

Abdomen (Fig. 14): with five exposed ventrites. First ventrite with a sharply raised median carina that extends posteriorly four-fifths the length of the ventrite; the first ventrite very long, more than twice as long as the second. Second ventrite without carina. Fifth ventrite entire; set with coarse, flat projections at apex (Fig. 17). All laterosternites projecting ventrally beyond the surface of the ventrites, creating a "bowl"-like appearance. Laterosternite 3 very wide (Fig. 15), much wider than the remaining laterosternites; dorsal half set with disorganized field of unarticulated cuticular projections without any discernable arrangement into a stridulatory "file"; ventral edge forming a deep groove for reception of the metatibiae. Aedeagus (Fig. 13) of the simple trilobed type, consisting of unbranched parameres, straight median lobe bearing the gonopore at the apex, and a basal piece.

ETYMOLOGY: Named for its superficial resemblance as a tiny member of the genus *Amphiops*. Masculine.

DISCUSSION: The erection of *Micramphiops* is based on both that it (1) lacks the presumed synapomorphies of each of the other genera of Chaetarthriini, and (2) possess a suite of unique, putatively derived characters not found in any other genus in the tribe. It is important to note, however, that no phylogeny for the group has yet been presented, and consequently these putative character polarizations remain untested.

Based on commonly used taxonomic and diagnostic characters, the Chaetarthriini contain two genus groups, the *Amphiops*-group and the *Chaetarthria*-group. The former had contained the two larger-bodied (longer than 3 mm) genera: the more common Old World genus *Amphiops* and the comparatively rare Neotropical *Guyanobius*. Aside from their larger size, both genera are characterized by divided (*Amphiops*) or nearly divided (*Guyanobius*) eyes and lack of a sutural stria. Although it is much smaller, *Micramphiops* shares the latter two characters and lacks the individual generic synapomorphies of both *Amphiops* (tibial hairs, spherical coxae) and *Guyanobius* (partially divided eyes, 9-segmented antennae, stiff coarse setae arising from the second abdominal ventrite).

The remaining chaetarthriine genera (*Hemisphaera* PANDELLÉ, *Chaetarthria* STEPHENS, and *Thysanarthria* ORCHYMONT) are all smaller-bodied (less than 3 mm) but have normal, undivided eyes and possess sutural striae. Most notably, these three genera also have a long fringe of setae arising from abdominal ventrite 1. While small in size, *Micramphiops* lacks the latter three characteristic features (and presumed synapomorphies) for this genus group and is seemingly not closely related. In addition to these characters shared among the three *Chaetarthria*-group genera, *Micramphiops* does not have the presumed generic synapomorphies of any of these individual genera such as elytral grooves (*Thysanarthria*) or rows of elytral punctures (*Hemisphaera*).

The bowl-like shape of the abdomen and grooved third laterosternite for reception of the metatibiae are distinct apomorphies of *Micramphiops* within the Chaetarthriini, and indeed, possibly unique within all Hydrophiloidea. Within the *Amphiops*-group, the carinate first abdominal ventrite can also be considered a putative apomorphy for *Micramphiops*.

Two additional chaetarthriine genera recently described from Venezuela (*Venezuelobium* GARCÍA and *Apurebium* GARCÍA) generally fit prior diagnoses of *Chaetarthria*. While GARCÍA (2002) provides some interesting distinguishing features, most of these are either found in some species of *Chaetarthria* (e.g. the shape of the head), or more typically used to separate species, rather than genera (e.g. paramere shape, relative lengths of antennal club segments, sutural stria length). While I believe it is premature to synonymize these genera, preliminary examination of paratype specimens of species in both genera leads me to conclude they are likely to be interesting variants of a more broadly delimited *Chaetarthria*.

Figs. 5–8: *Micramphiops newtoni*; 5) prothorax, ventral view, scale bar = 0.2 mm; 6) meso- and metaventrites, scale bar = 0.2 mm; 7) mesofemur, scale bar = 0.1 mm; 8) metafemur, scale bar = 0.1 mm.

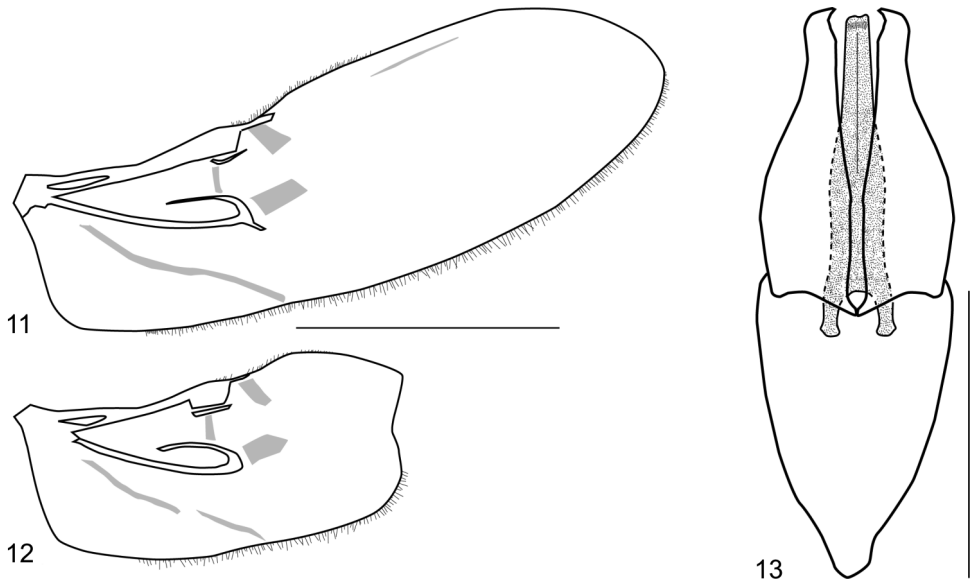
Figs. 9–10: *Micramphiops newtoni*; 9) elytra, dorsal; 10) elytra, ventral; scale bar = 0.5 mm.

***Micramphiops newtoni* sp.n.**
(Figs. 1–17)

TYPE MATERIAL: **Holotype** ♂: "MADAGASCAR: Antsiranana Prov./ R.[éserve] S.[péciale] Manongarivo, 24. Km SW 219°/ Antanambao. 1860m BLF#1990/ 14°2.72'S, 48°24.06'E, 3.xi.1998/ FMHD#98-375; montane forest/ sifted litter, winkler ext., B. Fisher" (FMNH). **Paratypes** (49): Same data as holotype (FMNH and University of Kansas Natural History Museum). One representative specimen will also be deposited in the National Museum (Prague, Czech Republic), the Natural History Museum (Vienna, Austria), and the US National Museum of Natural History (Washington, DC, USA).

DESCRIPTION: Body Length: 1.4–1.7 mm. Head: Antennae with segments 1–5 subequal in length to club, with pedicle slightly bulbous. Apical segment of club slightly shorter than other two segments combined. Systematic punctures sparse mesad of each eye on the frons and in a broad arc along the anterior margin of the clypeus.

Thorax: Elytra with indented "groove" along anterior half near lateral margin (Fig. 9); anteroventral quarter of elytra with sparse but distinct ground punctation, the remaining elytral surface largely impunctate. Males with a single large plate-like seta on protarsal segments 1–3 (Fig. 5). Mesofemora (Fig. 7) with anterior and posterior margins strongly angulate, dorsal surface strongly roughened, and anterior third depressed such that it is not in the same plane as the rest of the femoral surface. Hind wings polymorphic, including fully-winged (Fig. 11) and short-winged (brachypterous, Fig. 12) morphs.

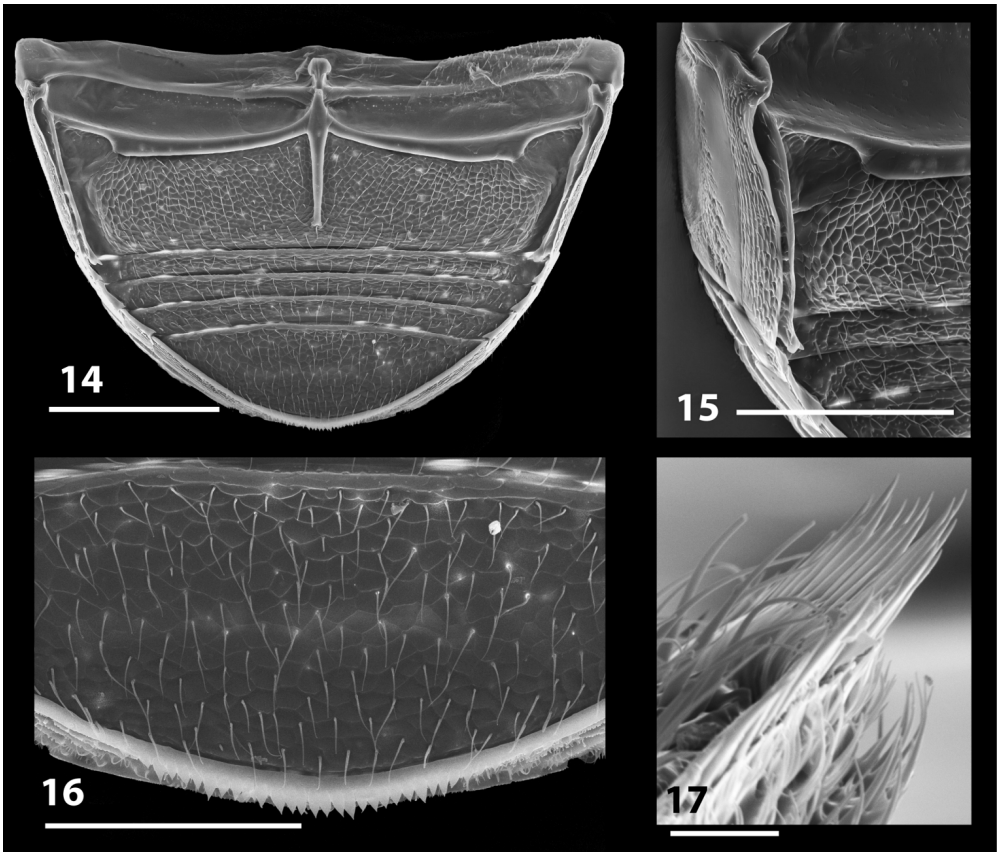


Figs. 11–13: *Micramphiops newtoni*; 11) wing, macropterous form; 12) wing, brachypterous form; scale bar = 1.4 mm; 13) aedeagus, dorsal view; scale bar = 0.22 mm.

Abdomen: Ventrite 1 ca. as long as ventrites 2–4 combined and also ventrite 5. Ventrites 2–4 subequal in length. Surface of all ventrites very rough and sparsely set with fine hairs. Aedeagus (Fig. 13) with parameres and basal piece subequal in length. Outer margin of parameres strongly sinuate, much narrower apically, with a small inward hooked appearance at apex. Apex of median lobe not quite meeting the apex of the parameres.

DISTRIBUTION: Madagascar.

ETYMOLOGY: Named in honor of Alfred F. Newton (FMNH), who first recognized this odd taxon as a new lineage of Chaetarthriini.



Figs. 14–17: *Micramphiops newtoni*; 14) abdomen, ventral view, scale bar = 0.2 mm; 15) laterosternite 3, scale bar = 0.1 mm; 16) abdominal ventrite 5, ventral view of apex, scale bar = 0.1 mm; 17) abdominal ventrite 5, lateral view of apex, scale bar = 0.01 mm.

BIONOMICS: As the only known specimens of this taxon were sifted from forest litter, it is tempting to conclude that they live terrestrially. They also seem to lack any obvious indicators of an aquatic lifestyle, such as the natatory tibial hairs of *Amphiops*. Further of interest is the polymorphic condition of the flight wings: of ten specimens examined, six possessed short wings, while four were fully winged. While a few fully-aquatic species of hydrophilids are known to have reduced or vestigial flight wings, the majority of species with this condition are in intermediate or terrestrial habitats (SHORT & LIEBHERR 2007, FIKÁČEK & SHORT 2006). All these factors taken together, it seems most likely the habitat of this species would be classified as "terrestrial". However, drawing any concrete conclusions based on a single collecting event (and where the larvae remain unknown) would be unwise.

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