

***Aphelocheirus winkleri* sp.n.**
(Hemiptera: Heteroptera: Aphelocheiridae)
from Uganda

Herbert ZETTEL

Abstract

Aphelocheirus (s.str.) *winkleri* sp.n. from Ssezibwa River in Central Uganda is described and illustrated. Close relatives are *Aphelocheirus corbeti* POISSON, 1955 from Uganda and *A. aschalewi* ZETTEL, 2021 from Ethiopia. The new species is only the sixth one known from sub-Saharan Africa.

Key words. *Aphelocheirus*, new species, taxonomy, Africa.

Zusammenfassung

Aphelocheirus (s.str.) *winkleri* sp.n. aus dem Ssezibwa River in der Provinz Central Uganda wird beschrieben und abgebildet. Die am nächsten verwandten Arten sind *Aphelocheirus corbeti* POISSON, 1955, ebenfalls aus Uganda, und *A. aschalewi* ZETTEL, 2021 aus Äthiopien. Die neue Art ist erst die sechste, die aus Afrika südlich der Sahara bekannt wurde.

Introduction

Species of Aphelocheiridae usually inhabit the bed of oxygen-rich streams and rivers. They breathe via a plastron (incompressible gas gill) and do not surface for respiration. Because they live in a stable environment, they rarely disperse outside the water. This is reflected in the low proportion of individuals able to fly. Aphelocheiridae are known for a high percentage of brachypterous individuals; records of flight – e.g., records from light traps – are rare in literature. The scarce dispersal attempts of Aphelocheiridae result in a high number of regionally endemic species, especially in tropical Asia (e.g., POLHEMUS & POLHEMUS 1988, ZETTEL 1999).

There is little knowledge about the taxonomy of Aphelocheiridae inhabiting sub-Saharan Africa. Publications are confined to scattered descriptions of five species based on a total of eight adult specimens. *Aphelocheirus schoutedeni* MONTANDON, 1914 from the Democratic Republic of Congo, *A. debilis* KIRITSHENKO, 1925 from Kenya, *A. corbeti* POISSON, 1955 from Uganda, *A. kumbanus* LINNAVUORI, 1975 from Cameroon, and *A. aschalewi* ZETTEL, 2021 from Ethiopia (MONTANDON 1914, KIRITSHENKO 1925, POISSON 1955, LINNAVUORI 1975, ZETTEL 2021). All African species belong to the nominotypical subgenus. LINNAVUORI (1975) included a short review of the formerly described species and a key, but this attempt was hindered by the fact that the types are of different sexes and wing morphs and therefore difficult to compare. Consequently, the study by POISSON (1955) is still the most useful tool for the taxonomy of African Aphelocheiridae.

Material and methods

The Ssezibwa River [alternative spelling: Sezibwa] has its source in the wetlands of Buikwe District near Ngogwe and flows into Lake Kyoga after ca. 150 km.

The four adult specimens described herein, as well as one probably conspecific nymph, were collected during the project SWAQ-UGANDA – Sustainable water quality management – supporting Uganda’s development ambitions.

The imagines were dry-mounted, pinned or glued on card boards for examination and photography. Genitalia of two males (paratypes) were dissected. The nymph is stored in 70% ethanol.

Insects were examined with a Leica Wild M10 binocular microscope (max. 128× magnification). Drawings (Figs 5–9) were made with the help of a camera lucida. The stacked digital images (Figs 1–3, 9) were taken with a Leica DFC490 camera attached to a Leica Z16APO optics carrier, using Leica Application Suite V3.8. The images were stacked with ZereneStacker 64-bit and processed with Adobe Photoshop 7.0.

If not mentioned otherwise, measurements (in millimetres) refer to the maximum length or width of the respective structure. They refer to the holotype or the single female paratype, if no range of variation is given.

Taxonomy

Aphelocheirus (s.str.) *winkleri* sp.n. (Figs 1–9)

Type material. Holotype (brachypterous male) and paratypes (2 brachypterous males, 1 brachypterous female) from Uganda, Central Uganda Province, Mabira Forest area, Sezibwa River at Sezibwa Falls north of Madudu, N 0°21'20.67", E 32°51'47.04", ca. 1120 m a.s.l., 18.VIII.2023, leg. Wolfram Graf, all dry-mounted, deposited in the Natural History Museum Vienna.

Non-type material. 1 nymph from the same locality (preserved in ethanol).

Description of brachypterous male. Measurements: Body length 8.1–8.4 (holotype 8.4); body width 5.4–5.7 (holotype 5.7). Head length 1.59–1.61 (holotype 1.61); head width (across eyes) 1.93–2.04 (holotype 2.04). Pronotum length (at midline) 1.03–1.06 (holotype 1.06); pronotum width 4.48–4.67 (holotype 4.67). Forewing length 1.81. Forewing width 1.69. Rostrum length 2.97. Profemur length 1.95.

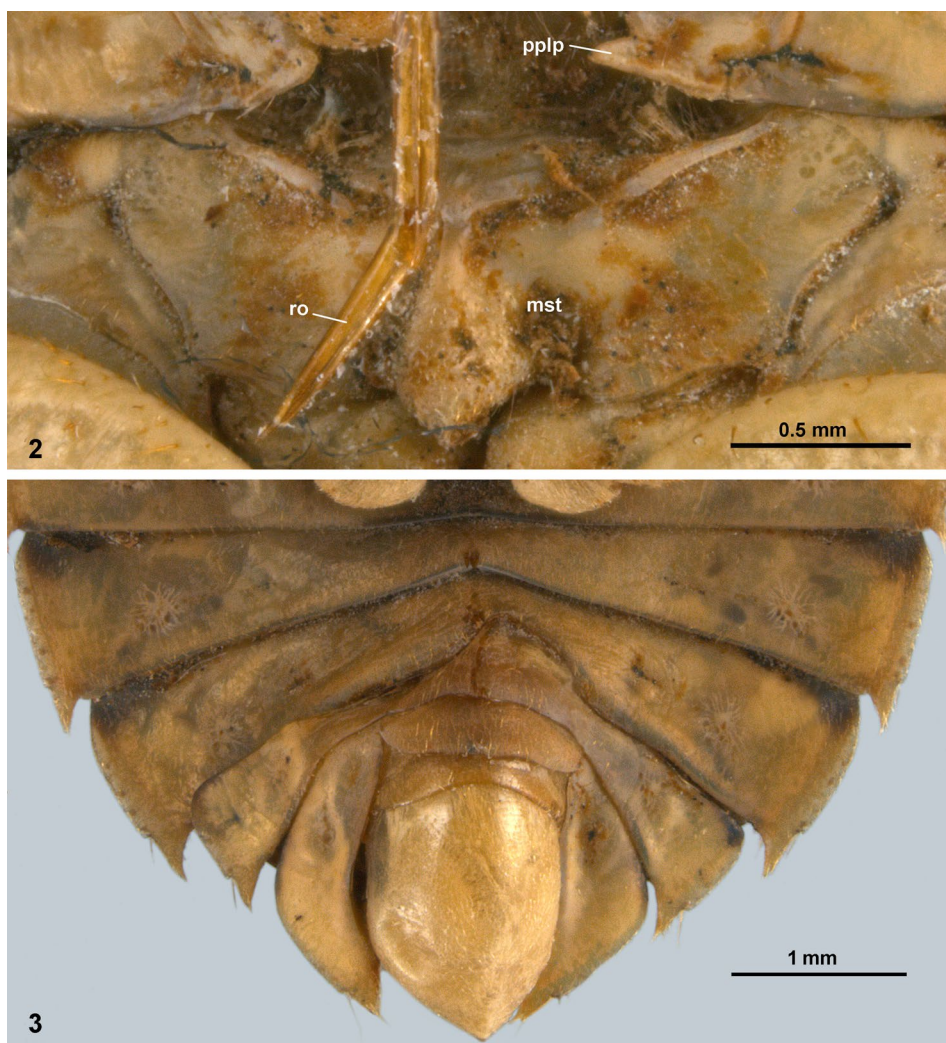
Colour. Dorsal colour pattern as in Figure 1: Head, mesoscutellum, and margins of pronotum, hemielytra, and terga yellow to pale brownish. Disc of pronotum dark brown with an irregularly shaped, yellow crossband. Forewing remnants dark brown, except on sides. Abdominal terga with an indistinct pattern of medium to pale brown areas. Venter and appendages yellow to pale brownish yellow.

Structures. Head (Fig. 1) 0.79 times as long as broad; anterior part (in front of anterior eye margin) short, 0.42 times eye length. Head dorsally punctured, between punctures shiny; punctures anteriorly fine, posteriorly between eyes coarse. Rostrum of medium length, 1.52 times as long as profemur; tip slightly surpassing posterior margin of mesosternum.

Sides of pronotum, the forewings and tergites coriaceous, matt. Middle of pronotum and middle of mesoscutellum rugulose-punctate, with a few shiny interstices. Anterior and posterior margin of pronotum transversely rugulose. A small area of tergum 2 (anteriorly between forewings) almost smooth, with a few transverse wrinkles, and shiny. Pronotum (Fig. 1)



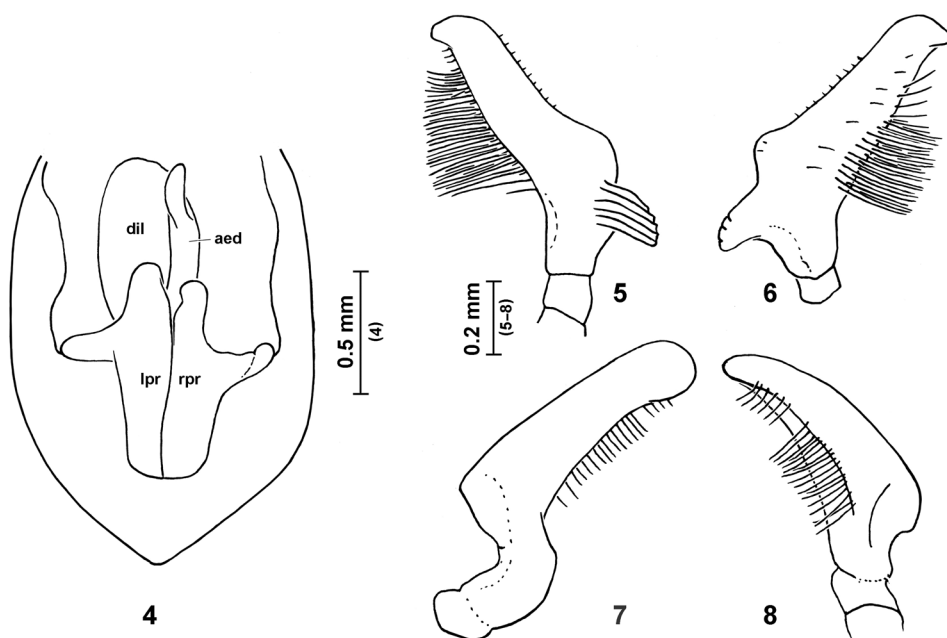
Fig. 1. *Aphelocheirus winkleri* sp.n., habitus of brachypterous male (holotype), dorsal view. © Harald Bruckner / NHMW.



Figs 2–3. *Aphelocheirus winkleri* sp.n. (2) Venter of a brachypterous male; cutout illustrating tip of rostrum (ro), propleural process (pplp), and mesosternum (mst), slightly oblique view perpendicular to left prosternal process (in picture on right side). (3) Abdominal venter of male. © Harald Bruckner / NHMW.

strongly transverse, 4.41 times as broad as median length, without demarcated lateral areas; hind margin laterally almost straight. Propleuron mesally with an acuminate process (Fig. 2). Mesoscutellum 2.5 times as broad as long. Elevation of mesosternum (Fig. 2) anteriorly with blunt median carina, posteriorly tumescent, in lateral aspect its outline only slightly convex, its apex slightly protruded posteriorly.

Forewings (Fig. 1) touching each other at body midline or with an extremely narrow gap; posterior margin broadly convex, almost reaching hind margin of tergite 2; forewing about one half wider than long (1.49 times), embolar margin with acute angle, but tip



Figs 4–8. *Aphelocheirus winkleri* sp.n. (4) Parandria (left: lpr; right: rpr) and aedeagus (sclerotised strap: aed; membranous dilatation: dil) in pygophore, dorsal view. (5, 6) Right paramere in dorsal (5) and approximately ventral view (6). (7, 8) Left paramere in dorsal (7) and ventral view (8). © Herbert Zettel / NHMW.

slightly rounded. Legs relatively short and stout; femora slightly thickened and hardly surpassing body sides.

Abdomen weakly asymmetrical. Hind margins of terga see Figure 1. Tergum 5 roundly protruded in middle. Connexival margins of abdominal segment 2 slightly acute, of segments 3–5 with distinct, acute tip, of segments 6 and 7 acutely protruded. Sterna (Fig. 3) medially without posteriad directed processes (in lateral view), sterna 4–6 each with 3 (rarely 2 or 4) peg-like, posteriorly directed setae near middle of hind margin. Hind margin of sternum 4 deeply emarginate on left side.

Genitalia of male. Genital capsule (Fig. 4) ovate, apex pointed. Parandria (Fig. 4) strongly developed, left one surpassing right one; left parandrium wide, apex rounded and slightly curved mesally; right parandrium distally with a roundish swelling. Aedeagus (Fig. 4) consisting of a narrow, basally slightly widened sclerotised strap and wide membranous dilatation. Right paramere (Figs 5, 6) slightly longer than left one, apex broadly rounded; on lateral side with a long, strongly furrowed subbasal process; pilosity on lateral side extremely long. Left paramere (Figs 7, 8) broadly subtriangular, with a widely rounded, slightly ventrolaterally curved apex; pilosity on lateral side long, although shorter than on right paramere.

Description of brachypterous female. Measurements: Body length 8.7; body width 5.6. Head length 1.58; head width (across eyes) 2.03. Pronotum length (at midline) 1.09; pronotum width 4.74. Rostrum length 3.00. Profemur length 1.80.



Fig. 9. *Aphelocheirus winkleri* sp.n., abdominal venter of female. © Harald Bruckner / NHMW.

Colour similar as in male.

Structures similar as in male. Head 0.78 times as long as broad; anterior part (in front of anterior eye margin) short, 0.45 times eye length. Rostrum of medium length, 1.60 times as long as profemur. Pronotum 4.35 times as broad as median length. Forewings as in male, almost touching each other; forewing 1.37 times as wide as long.

Abdomen symmetrical. Sterna 4–6 each with 3–4 stout, peg-like, posteriorly directed setae near middle of hind margin. Subgenital plate (sternum 7; Fig. 9) 1.20 times broader than long (1.32 : 1.10), bearing one small, peg-like seta; one pair of long, stout setae near lateral margins and a transverse row of much smaller and more slender setae close to hind margin; surface moderately pilose in posterior half.

Comparative notes. *Aphelocheirus winkleri* sp.n. can be distinguished from its African congeners by the following characters: *Aphelocheirus debilis* and *A. kumbanus*, both only known in the macropterous female, possess a more strongly produced forehead (see LINNAVUORI 1975: figs 2a, 3a). In addition, these species differ from *A. winkleri* sp.n. clearly in the shape of the female's subgenital plate (sternum 7), which is either of triangular shape (*A. kumbanus*; LINNAVUORI 1975: fig. 2b) or about as long as wide (*A. debilis*; LINNAVUORI 1975: fig. 2c). The forewing remnants (of brachypterous morph) of *A. schoutedeni* and *A. aschalewi* are distant from each other, those of *A. schoutedeni* notably small (LINNAVUORI 1975: fig. 1a), while those of *A. corbeti* and *A. winkleri* sp.n. meet at the body midline (POISSON 1955: fig. 13; Fig. 1). There are several external characters that distinguish *A. winkleri* sp.n. from *A. corbeti* (characters of *A. corbeti* from POISSON 1955): the head is longer (length : width ca. 0.8 in *A. winkleri* vs. 0.65 in *A. corbeti*), the pronotum is slightly shorter (width : length 4.35–4.41 in *A. winkleri* vs. 4.25 in *A. corbeti*), the forewing remnants are slightly longer (width : maximum length, ca. 1.37–1.49 in *A. winkleri* vs. 1.6 in *A. corbeti*) and almost reach the hind margin of tergum 2 (clearly



Fig. 10. Type locality at Ssezibwa River. © Wolfram Graf.

distant in *A. corbeti*). The hind margin of tergum 5 is rounded in the middle (truncated in *A. corbeti*). However, the most significant differences are found in the genitalia of males: The left paramere possesses a brush of long setae on the lateral side (lacking in *A. corbeti*; see POISSON 1955: fig. 14B), and the apex of both parameres is comparatively broad (comp. Figs 6–9 with figs 14B and 14C in POISSON 1955).

Distribution. Only known from the type locality in Uganda, Ssezibwa River.

Etymology. The species name honours Gerold Winkler for his decades-long efforts in initiating and supporting hydrobiological studies and developing and enhancing institutional capacity for water quality management in Africa.

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Author’s address: Herbert ZETTEL,
2nd Zoological Department,
Natural History Museum,
Burgring 7, A-1010 Vienna, Austria
E-mail: herbert.zettel@nhm-wien.ac.at

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