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## ***Aphelocheirus aschalewi* nov.sp., first record of Aphelocheiridae (Hemiptera, Heteroptera) from Ethiopia**

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**A b s t r a c t :** *Aphelocheirus* (s.str.) *aschalewi* nov.sp. from Mille River, a tributary to Awash River in Ethiopia, is described and imaged. It is the first record of Aphelocheiridae from Ethiopia and the fifth species from tropical Africa.

**K e y w o r d s :** *Aphelocheirus*, new species, taxonomy, Africa.

### **Introduction**

The Aphelocheiridae of tropical Africa are poorly studied. Publications regarding their taxonomy are confined to descriptions of four species, each based on a single individual: *Aphelocheirus schoutedeni* MONTANDON, 1914 from the Democratic Republic of Kongo, *A. debilis* KIRITSHENKO, 1925 from Kenya, *A. corbeti* POISSON, 1955 from Uganda, and *A. kumbanus* LINNAVUORI, 1975 from Cameroon (MONTANDON 1914, KIRITSHENKO 1925, POISSON 1955, LINNAVUORI 1975). All belong to the nominotypical subgenus. POLHEMUS & POLHEMUS (1988) suggested that the African fauna of Aphelocheiridae may be vastly underestimated. However, until today there has been no evidence for this assumption.

LINNAVUORI (1975) included a short review of the formerly described species and attempted a key, but this is hindered by the fact that the types are of different sexes and wing morphs that are difficult to compare. His study and the illustrations of male genitalia provided by POISSON (1955) for *A. corbeti* are the most useful tools for the taxonomy of African Aphelocheiridae.

Species of Aphelocheiridae usually have a high percentage of brachypterous, flightless individuals, and records of flight are scarce in literature. The poor dispersal abilities result in a high number of regionally endemic species (e.g., POLHEMUS & POLHEMUS 1988, ZETTEL 1999). The Awash River system, to which the Mille River, type locality of the new species, belongs, is endorheic (ENGLMAIER et al. 2020). This fact supports the expected presence of endemic species.

### **Material and methods**

The specimens described herein were collected during a limnological project (LARIMA) of the University of Natural Resources and Life Sciences, Vienna (BOKU). Ecological details of the Mille River close to the type locality can be found in ENGLMAIER et al. (2020). The imagines were dry-mounted on triangular card boards for examination and

photography. Genitalia of two males were dissected. In addition to the types, the sample contained two probably conspecific nymphs that are stored in 70 % ethanol.

Insects were examined with a Leica Wild M10 binocular microscope (max. 128× magnification). Drawings (Figs. 2–8) were made with the help of a camera lucida. The stacked digital image (Fig. 1) was taken with a Leica DFC450 camera attached to a Leica Z16APO optics carrier, using Leica Application Suite V3.8. The image was 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, if no variation is given.

## Taxonomy

### *Aphelocheirus* (s.str.) *aschalewi* nov.sp. (Figs 1-8)

**Type material:** Holotype (brachypterous male) and paratypes (2 brachypterous males) from Ethiopia, Afar Province, Kalle Alli, Mille River, N 11°25'00", E 40°45'51", 490 m a.s.l., 12.III. 2019, leg. W. Graf, deposited in the Natural History Museum Vienna.

**Description of brachypterous male:** Measurements: Body length 5.8-5.9; body width 3.8-4.0. Head length 1.20-1.26; head width (across eyes) 1.45-1.48. Pronotum length (at midline) 0.74-0.80; pronotum width 3.19-3.20. Rostrum length 2.03. Profemur length 1.49.

**Colour:** Body and appendages chiefly pale yellow. Dorsal colour pattern as in Figure 1: Pronotum anteriorly with a wide, blurred, M-shaped mark, posteriorly with a narrow transverse blackish brown stripe. Forewing remnants dark brown, sides yellow. Abdominal tergites chiefly medium brown, sides of tergites anteriorly dark brown, posteriorly yellow.

**Structures:** Head 0.84 times as long as broad; anterior part (in front of anterior eye margin) very short, 0.38 times eye length (Fig. 1). Head dorsally with very few large and numerous small punctures, shiny. Sides of pronotum, forewings and tergites coriaceous, matt. Disc of pronotum and middle of mesoscutellum rugulous-punctate, shiny. Anterior and posterior margin of pronotum transversely rugulose. Pronotum strongly transverse, 4.15 times as broad as median length, without demarcated lateral areas; hind margin laterally almost straight (Fig. 1). Mesoscutellum 2.5 times as broad as long. Forewings clearly distant from each other, caudally almost reaching hind margin of tergite 2 (Fig. 1), with obtuse angle at embolar margin; forewing width about one third longer than length (1.81: 1.35). Connexival margins of abdominal segment 2 and 3 nearly rectangular, of segments 4–6 with small, acute tip, of segment 7 acutely protruded.

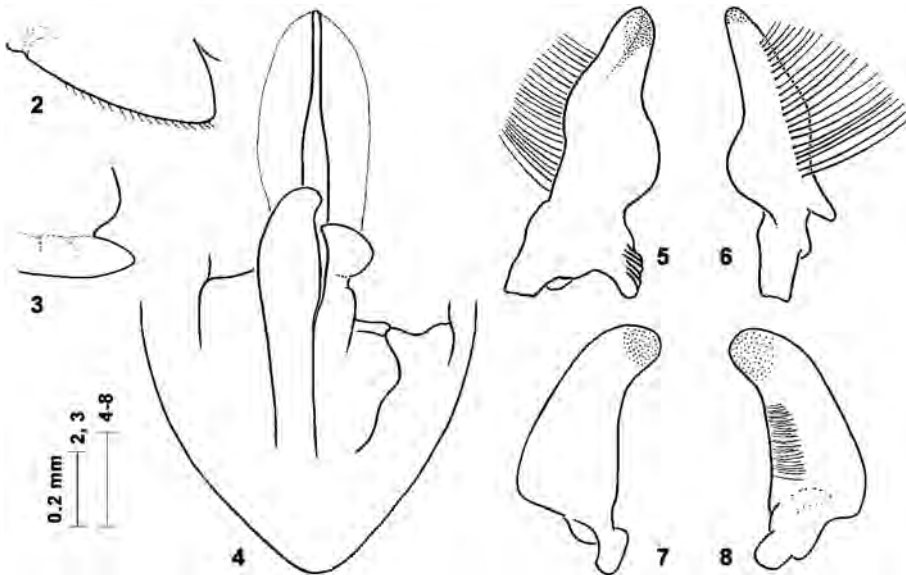
Rostrum of medium length, 1.36 times as long as profemur, slightly surpassing posterior margin of mesosternum. Legs relatively short and stout; femora slightly thickened and hardly surpassing body sides. Propleuron mesally with an acuminate process (Fig. 3). Mesosternum with blunt median carina, steadily raised from anterior to posterior margin, its outline only slightly convex in lateral aspect (Fig. 2). Abdomen weakly asymmetrical. Tergite 5 roundly protruded in middle (Fig. 1). Sternites medially without posteriad directed processes, sternites 4–6 each with one pair of peg-like, standing setae near middle of hind margin (lacking on sternite 6 in one specimen).



**Fig. 1:** *Aphelocheirus aschalewi* nov.sp., habitus of brachypterous male (holotype); legs omitted.

Genitalia of male: Genital capsule posteriorly slightly acuminate (Fig. 4), apex narrowly rounded. Parandria (Fig. 4) strongly developed, left one surpassing right one; left paramere 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 dilations on both sides. Right paramere (Figs. 5, 6) slightly longer than left one, apex narrower; on lateral side with a subbasal strongly furrowed process; pilosity on ventral side extremely long. Left paramere (Figs. 7, 8) broadly subtriangular, with a widely rounded apex; pilosity on ventral side short.



**Figs 2-8:** *Aphelocheirus aschalewi* nov.sp.: (2) mesosternum, lateral view; (3) apex of propleuron, ventral view; (4) parandria and aedeagus, 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).

**Comparative notes:** *Aphelocheirus aschalewi* nov.sp. can be easily distinguished from its African congeners by small size and a highly contrasting colour pattern (Fig. 1). *Aphelocheirus debilis* and *A. kumbanus*, both only known in the macropterous female, possess a more strongly produced forehead (see LINNAVUORI 1975: figs 2a, 3a). Experience with Asian species of *Aphelocheirus* has shown that the head shape does not vary among wing morphs of the same species. The forewing remnants of *A. schoudeteni* are very small, elongate and widely distant from each other (LINNAVUORI 1975: fig. 1a), while those of *A. corbeti* meet each other at body midline (POISSON 1955: fig. 13). The size of the forewings is intermediate in *A. aschalewi* nov.sp. The genitalia of *A. aschalewi* nov.sp., most of all the parameres, resemble those of *A. corbeti*, suggesting a close relationship, however, the apices of both parameres are broader in *A. aschalewi* nov.sp. than in *A. corbeti* (comp. Figs 5–8 with POISSON 1955: figs 13B, C).

**Etymology:** The species name honours Aschalew Haile Lakew for his important role in establishing and conducting the LARIMA Project.

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## Zusammenfassung

*Aphelocheirus* (s.str.) *aschalewi* nov.sp. wird aus dem Mille River, einem Zubringer des Awash River in Äthiopien, beschrieben und abgebildet. Es handelt sich um den ersten Nachweis der Aphelocheiridae (Grundwanzen) aus Äthiopien und die fünfte Art aus dem tropischen Afrika.

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