

Descriptions of two new species of *Gyrocarisa* (Trichoptera: Petrothrincoidea) from Madagascar

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ABSTRACT

Two new species of the Malagasy endemic genus *Gyrocarisa* (Trichoptera: Petrothrincoidea), *Gyrocarisa scottae*, new species, and *Gyrocarisa weaveri*, new species, are described and illustrated. A key to the males of the known species of *Gyrocarisa*, and additional records of *G. stenieri* Weaver and *G. acuta* Weaver are given.

Key words: Trichoptera, Petrothrincoidea, *Gyrocarisa*, *Gyrocarisa scottae*, *Gyrocarisa weaveri*, new species, new records

INTRODUCTION

The caddisfly family Petrothrincoidea Scott, 1985 includes the 2 recognized genera, *Petrothrincoidea* Barnard, 1934 from South Africa and *Gyrocarisa* Weaver, 1997 from Madagascar. The genus *Petrothrincoidea* was erected for the single species *Petrothrincoidea circularis* Barnard, 1934, and placed *incerta sedis* in Aequipalpia outside of existing families. The genus was classified in the Sericostomatidae *sensu lato* by Lestage (1936), and in the Helicopsychidae by Ulmer (1955). Later, Fischer (1964) catalogued it in the Molannidae. Scott (1985) erected the family Petrothrincoidea for this genus. Scott (1993) later described adult male, female and larvae of the family and its monotypic genus in proper detail. Weaver (1997) described a new genus, *Gyrocarisa* of Petrothrincoidea, to which he included 3 new species, *G. steineri* Weaver, *G. acuta* Weaver, and *G. concava* Weaver, all endemic to Madagascar.

In this paper, 2 new species of *Gyrocarisa*, *Gyrocarisa scottae* and *Gyrocarisa weaveri*, are described, both from Fianarantsoa Province, Madagascar.

MATERIAL & METHODS

All specimens examined in this work were collected by Dr. M.E. Irwin (Department of Natural Resources and Environmental Sciences, University of Illinois, USA) and Prof. E.I. Schlinger (Department of Entomological Sciences, University of California, Berkeley, USA) in Malaise traps in December 1999. The material is preserved in alcohol and deposited at the Illinois Natural History Survey (INHS) and the Swedish Museum of Natural History (NRM).

Morphological terminology follows that of Weaver (1997). Before examination of the genitalia, abdomens were cleared with proteinase-K at 56°C for 2 hours, with additional clearing completed in KOH. Abdomens were then dehydrated in absolute alcohol before a temporary mount in euparal was made on microscope slides. After examination the genitalia were cleaned in absolute alcohol and placed in vials of 80% ethanol.

SPECIES DESCRIPTIONS

Gyrocarisa scottae, new species

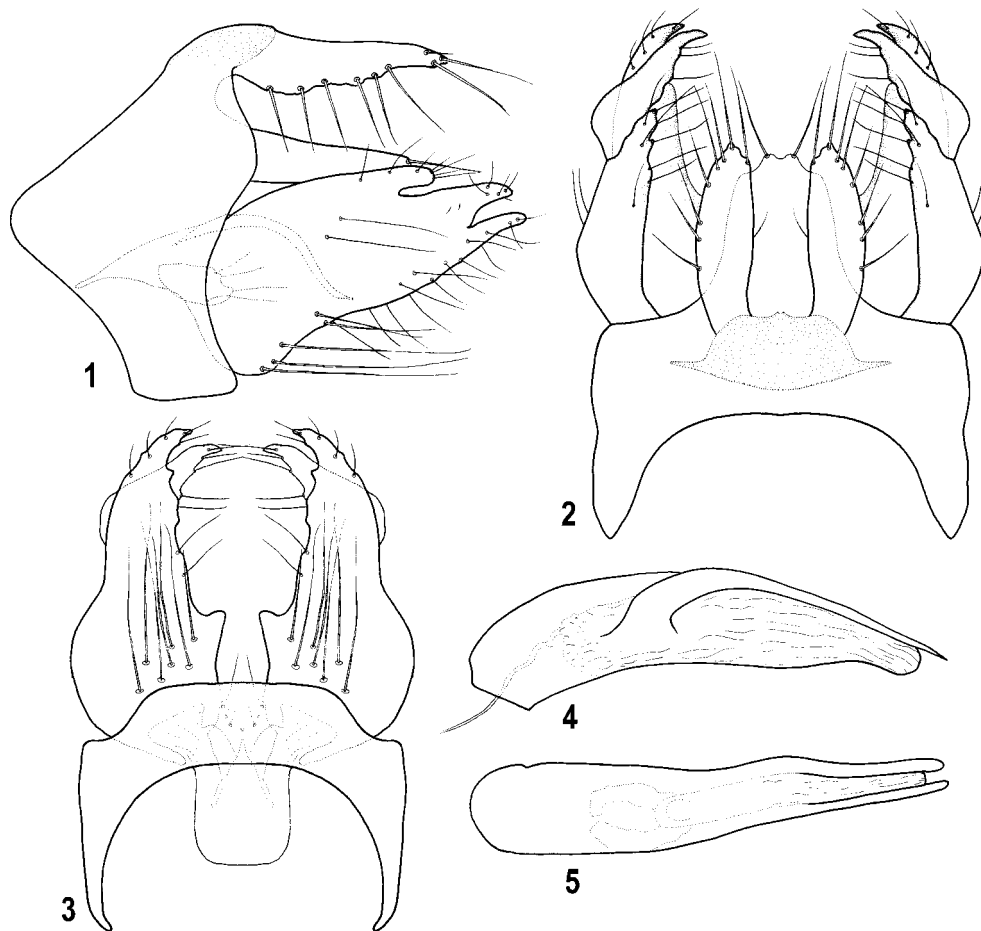
Fig. 1–5

G. scottae differs from other species of *Gyrocarisa* by having the phallus with 2 long, slender, acuminate parameres adjacent to its apicodorsal margin. *Gyrocarisa scottae* differs from *G. steineri*, *G. concava* and *Gyrocarisa weaveri* by the long, wedge-shaped inferior appendages. It appears to be more closely related to *G. acuta* by the overall genitalic structure, although *G. scottae* has longer superior processes of segment X and smooth ventral margins on the inferior appendages.

Male: Head: Maxillary palps 5-segmented, each with 1st segment about 3 times longer than wide, 2nd about half as long as first, 3rd shortest, 4th and 5th 2 times longer than 1st. Forewing 4.1 mm; hind wing 2.8 mm.

Genitalia: Segment IX with anterior margin broadly triangular in lateral view (Fig. 1), curved mesad in ventral view (Fig. 3). Superior processes cylindrical, slightly longer than inferior process, directed posteriad; mesal margins parallel, lateral margins slightly convex in dorsal view (Fig. 2); tapering distally; ventral margin undulate with long lateral and apical setae in lateral view (Fig. 1). Segment X inferior process directed posteriorly, slightly tapering distad; with pair of minute, rounded processes at apex in dorsal view, each bearing a long seta. Inferior appendage with elongate base (Fig. 1), wedge-shaped, directed posterodorsad, with 3 posteriorly oriented, vertically adjacent apical lobes, curving mesad in ventral view (Fig. 3); ventral margin smooth in lateral view (Fig. 1); mesal margin undulate in ventral view (Fig. 3), basally with short, rounded posteromesad process. Phallic guide slender along its length, oriented posterodorsad at base, curving ventrad along its length to posteriorly angled apex in lateral view (Fig. 1). Phallus tapering along its length

and curved ventrad (Fig. 4). Parameres with bases directed dorsad; apical 4/5 curved posteriad, adjacent to apicodorsal margin of phallus, slender and acuminate in lateral view (Fig. 4).



FIGURES 1–5. *Gyrocarisa scottae*, new species, holotype. 1—male genitalia, lateral; 2—male genitalia, dorsal; 3—male genitalia, ventral; 4—phallus, lateral; 5—phallus, ventral.

Holotype male: MADAGASCAR: Fianarantsoa Province: Ranomafana, Malaise trap near river in tropical forest, 12–20.xii.1999, 1150 m, 21.2554°S, 47.4552°E, M.E. Irwin, E.I. Schlinger (INHS, alcohol).

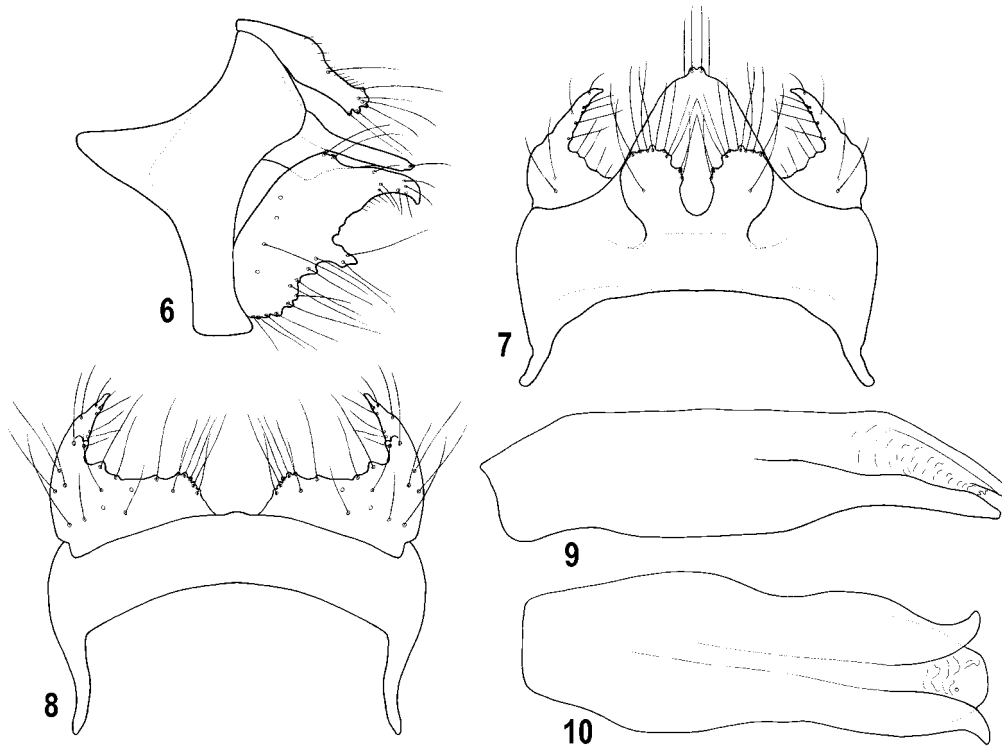
Etymology: This species is named after Dr. K.M.F. Scott, for her valuable contribution to the understanding of African Trichoptera diversity over several decades.

Gyrocarisa weaveri, new species

Fig. 6–10

Gyrocarisa weaveri differs from *G. acuta*, *G. concava* and *G. scottae* by having male genitalia with inferior appendages rhomboid in lateral view, and segment X with short superior processes. It resembles *G. steineri* by the overall genitalic shape, but differs by having U-shaped inferior process of segment X and the inferior appendages with only 1 apical lobe at posterodorsal corner.

Male: Head: Maxillary palp 1st segment 3 times longer than wide, 2nd segment about half as long as segment 1, 3rd shortest, 4th about 3 times longer than 1st segment and 5th segment slightly longer than 4th. Forewing 4.3 mm; hind wing 3.0 mm.



FIGURES 6–10. *Gyrocarisa weaveri*, new species, holotype. 6— male genitalia, lateral; 7—male genitalia, dorsal; 8—male genitalia, ventral; 9—phallus, lateral; 10—phallus, ventral.

Genitalia: Segment IX with anterior margin sharply pointed anterodorsad in lateral view (Fig. 6), curved laterad in ventral view (Fig. 8). Superior process short and circular in dorsal view, with long setae and erect bases along posterior and mesal margin, separated by U-shaped notch (Fig. 7); directed posteroventrad, widening at blunt apex, ventral margin smooth in lateral view (Fig. 6). Inferior process of segment X triangular, produced posteriorly with rounded posterior margin in dorsal view (Fig. 7), with pair of minute processes

at apex bearing few long setae, directed posteroventrad in lateral view (Fig. 6); with broad, triangular basoventral process and tapering towards setose apex. Inferior appendage short in ventral view (Fig. 8); rhomboid, oriented posterodorsad, with slightly concave dorsal margin in lateral view (Fig. 6). Posterodorsal corner of inferior appendage produced posteriad, with apex pointed and curved ventrad in lateral view (Fig. 6), posterior margin slightly undulate due to erect setal bases along margin, produced medially and pointed posteroventrally; in ventral view posterior margin slightly concave and undulate (Fig. 8). Phallus nearly straight, tapering distally in lateral view (Fig. 9); ventroapically membranous. Pair of posteriorly directed phallic parameres originate medially, tapering distad in lateral view (Fig. 9); apex curved laterad in ventral view (Fig. 10).

Holotype male: MADAGASCAR: Fianarantsoa Province: Ranomafana, Malaise trap near river in tropical forest, 12–20.xii.1999, 1150 m, 21.2554°S, 47.4552°E, M.E. Irwin, E.I. Schlinger (INHS, alcohol).

Etymology: The species is named after Dr. John S. Weaver III (New Hampshire Department of Agriculture, Concord, NH, USA), for his contribution to the knowledge on the Petrothrincidae.

ADDITIONAL RECORDS OF *GYROCARISA* SPECIES FROM MADAGASCAR

Gyrocarisa stenieri Weaver

MADAGASCAR: Fianarantsoa Province: Ranomafana, Malaise trap near river in tropical forest, 12–20.xii.1999, 1150 m, 21.2554°S, 47.4552°E, M.E. Irwin, E.I. Schlinger – 1 male (NRM, alcohol).

Gyrocarisa acuta Weaver

MADAGASCAR: Fianarantsoa Province: Ranomafana, Malaise trap near river in tropical forest, 12–20.xii.1999, 1150 m, 21.2554°S, 47.4552°E, M.E. Irwin, E.I. Schlinger – 2 males (NRM, alcohol), 5 males (INHS, alcohol).

Key to males of *Gyrocarisa*

1. Segment X with inferior process narrow, fingerlike in dorsal view
..... *Gyrocarisa steineri* Weaver
Segment X inferior process wide, U- or V-shaped in dorsal view (Fig. 2) 2
- 2(1). Inferior appendages wedge-shaped in lateral view (Fig. 1) 3
Inferior appendages rectangular or rhomboid in lateral view (Fig. 6) 4
- 3(2). Superior processes of segment X shorter than inferior process; inferior appendage

- ventral margin irregular, with 4–5 minute processes *Gyrocarisa acuta* Weaver
 Superior processes of segment X about as long or longer than inferior process (Fig. 1); inferior appendage ventral margin smooth (Fig. 1)
 *Gyrocarisa scottae*, new species
- 4(2). Superior process of segment X about as long as inferior process; inferior appendage rectangular, posterior margin with apical processes separated by narrow notch
 *Gyrocarisa concava* Weaver
 Superior process of segment X about half as long as inferior process (Fig. 6); inferior appendage rhomboid (Fig. 6), posterior margin with apical processes separated by wide notch (Fig. 6) *Gyrocarisa weaveri*, new species

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