

## REDESCRIPTION OF *MICROCYCLOPS CUNNINGTONI* (G.O. SARS, 1909) (COPEPODA, CYCLOPOIDA)

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ABSTRACT: *Microcyclops cunningtoni*, a poorly known cyclopoid, is redescribed using specimens from Lake Tanganyika, the type locality. A differential diagnosis is presented.

KEY WORDS: Cyclopoida, *Microcyclops cunningtoni*, redescription, Lake Tanganyika.

The taxonomy of the genus *Microcyclops* is extremely confusing. There are many species which are inadequately described. *Microcyclops cunningtoni* (G.O. Sars, 1909) is one of the most poorly known representatives of the genus *Microcyclops* Claus, 1893. The species was originally described from Lake Tanganyika (Sars, 1909), and is so far known only from this waterbody. The original and subsequent descriptions by Kiefer (1929) and Lindberg (1951) are inadequate from the point of view of modern copepod taxonomy. In this paper I redescribe the female and male of *M. cunningtoni* based on specimens identified by K. Lindberg from Lake Tanganyika.

### MATERIAL AND METHODS

*Material examined*: two females and one male from the lake Tanganyika, from the K. Lindberg Collection in the Royal Belgian Institute of Natural Sciences, Brussels.

All drawings were made using a drawing tube. Designations of furcal setae are given as follows: Ti, innermost apical furcal seta, Te, outer apical furcal seta, Sd, dorsal furcal seta. Pereopods (legs) 1-5 are designated as P1-P5, endopodite as enp.

### RESULTS

#### *Microcyclops cunningtoni* (G.O. Sars)

*Female*. Body length 700  $\mu\text{m}$ . Body widest at posterior part of cephalothorax, tapered anteriorly. Postero-lateral margins of 4<sup>th</sup> and 5<sup>th</sup> pedigerous somites rounded (Fig. 1). Lateral sides of 5<sup>th</sup> thoracic somite without ornamentation. Genital double-somite about as long as wide. Shape of seminal receptacle as in Fig. 2. Posterior margin of anal somite bearing two groups of 15 spinules on ventral and lateral sides (Figs. 3-4). Anal operculum moderately developed, convex (Fig. 3).

Furcal rami: parallel, 2.2-2.3 times as long as wide, with smooth inner surface. Insertions of Te furcal setae provided with spinules. Plumage of Tmi and Tme furcal setae homogenous. Lateral seta situated in posterior half, at 55% of total length of ramus. Ti about as long as caudal ramus and Sd slightly longer than Te.

Antennules (Fig. 5): 12-segmented, short, reaching middle of cephalothorax, armored as follows (segment number in Roman numerals, setal number in Arabic numerals, aesth = aesthetasc, sp = spine): I(8)-II(4)-III(2)-IV(5)-V(4)-VI(1+sp)-VII(2)-VIII(3)-IX(2)-X(2)-XI(2)-XII(7+aesth).

Antenna (Figs. 6, 7): basoendopodite bearing 3 setae, inner (exopodite) seta slightly shorter than outer setae. Caudal side of basoendopodite with 2 rows of spinules, frontal side with one straight and one curved row of spinules. A group of spinules near implantation of inner seta. Second endopodite bearing 9 setae.

Maxillule and maxilliped as in Figs. 8 and 10 respectively. Inner movable claw-like seta of basis of maxilla bearing 2 thin teeth on inner margin (Fig. 9, arrow).

Natatory legs with 2-segmented rami. Spine formula 3.4.4.3, setal formula 5.5.5.5 (Figs. 11-14). Inner margin of basis of P1 with long robust spine reaching beyond middle of P1enp2 (Fig. 11). Inner margin of basis of P1-P4 bearing setules, setules on P4 shorter than those on P1-P3 (Figs. 11-14). Intercoxal sclerites of P1-P3 smooth, these of P4 bearing 2 interrupted rows of spinules on caudal surface (Figs. 11-14). Outer margins of exopodite P1 smooth, outer margins of exopodites 1 of P2-P4 bearing spinules, those of exopodites 2 of P2-P4 bearing setules.

P4enp2 L/W = 1.9. Inner terminal spine slightly shorter than article and 2.2 times longer than outer terminal spine (Fig. 14). P5 relatively short (L/W=1.5-1.6), bearing long apical setae and tiny spinule on inner side (Fig. 2).

*Male.* Body length 480  $\mu\text{m}$ . Morphology of legs and mouthparts similar to that of female. In contrast to female, spinules of caudal margin of anal somite are situated not only on ventral and lateral, but also on dorsal side (Figs. 15-16). Also in contrast to female the second endopodite of male antenna bearing 8 setae. Distal segment of endopodite of P4 of male demonstrates the same proportions as in female (Fig. 17). Outer seta of P6 are about 4 times as long as the middle seta and 7 times as long as inner spine (Fig. 18).

## DISCUSSION

The morphology of the specimens studied and identified previously by K. Lindberg as *M. cunningtoni* in general readily corresponds to the description given by G. O. Sars (1909). However, Sars's specimens were

slightly larger (body length of female 860  $\mu\text{m}$ ), with a relatively shorter inner apical spine of P4enp2 (inner spine about 2.6 times as long as outer spine).

The only African species of *Microcyclops* which has 2 rows of spinules on the intercoxal plates of P4 is *M. rubelloides* Kiefer also inhabiting lake Tanganyika (Kiefer, 1952). Both species are apparently closely related, sharing such characters as:

- type of ornamentation of anal somite;
- 12-segmented antennules;
- presence of 9 setae on second endopodite of antenna in female;
- presence of spinules on outer margins of first segments of exopodites of natatory legs;
- presence of setules on inner margin of basis of P4;
- proportions of furcal rami;
- proportions of P4enp2.

*M. cunningtoni* differs from *M. rubelloides* mainly by the presence of spinules near the implantation of the Te, a relatively shorter Ti, and a relatively shorter outer apical spine of the endopodite of P4, which is about 0.7-0.8 times as long as the inner spine in *M. rubelloides* and only 0.4-0.5 in *M. cunningtoni* (unpublished observations of *M. rubelloides* in F.Kiefer's collection in Karlsruhe and U.Einsle' collection in Oldenburg).

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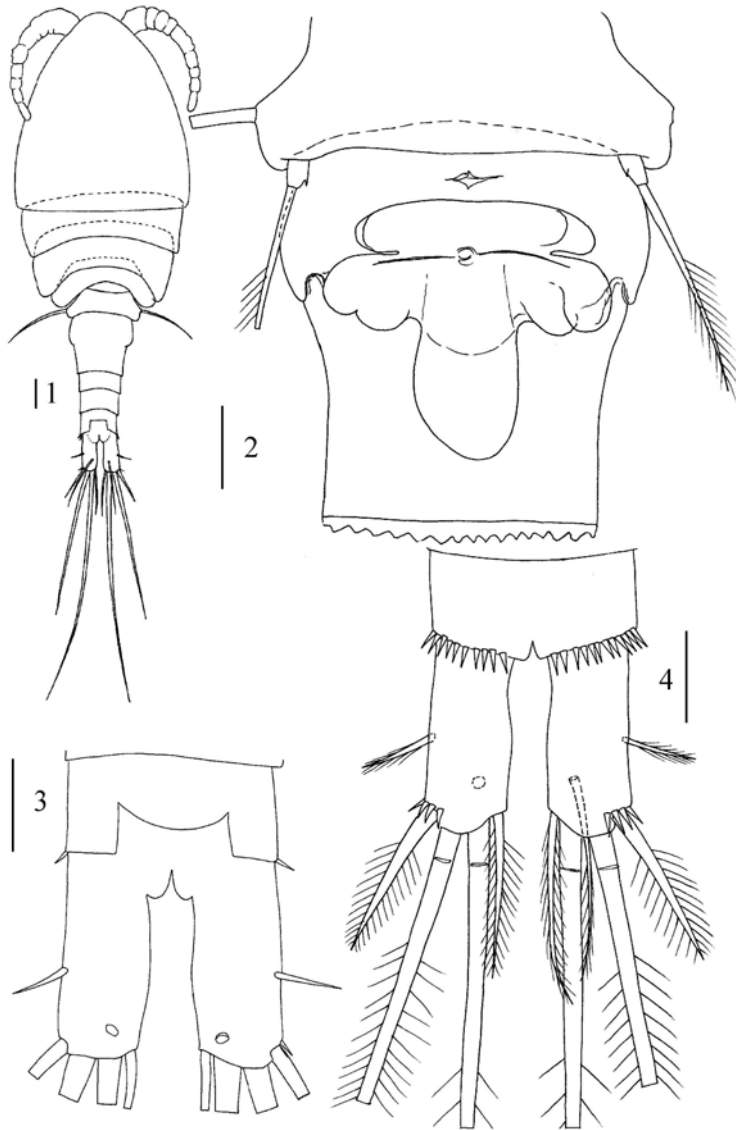
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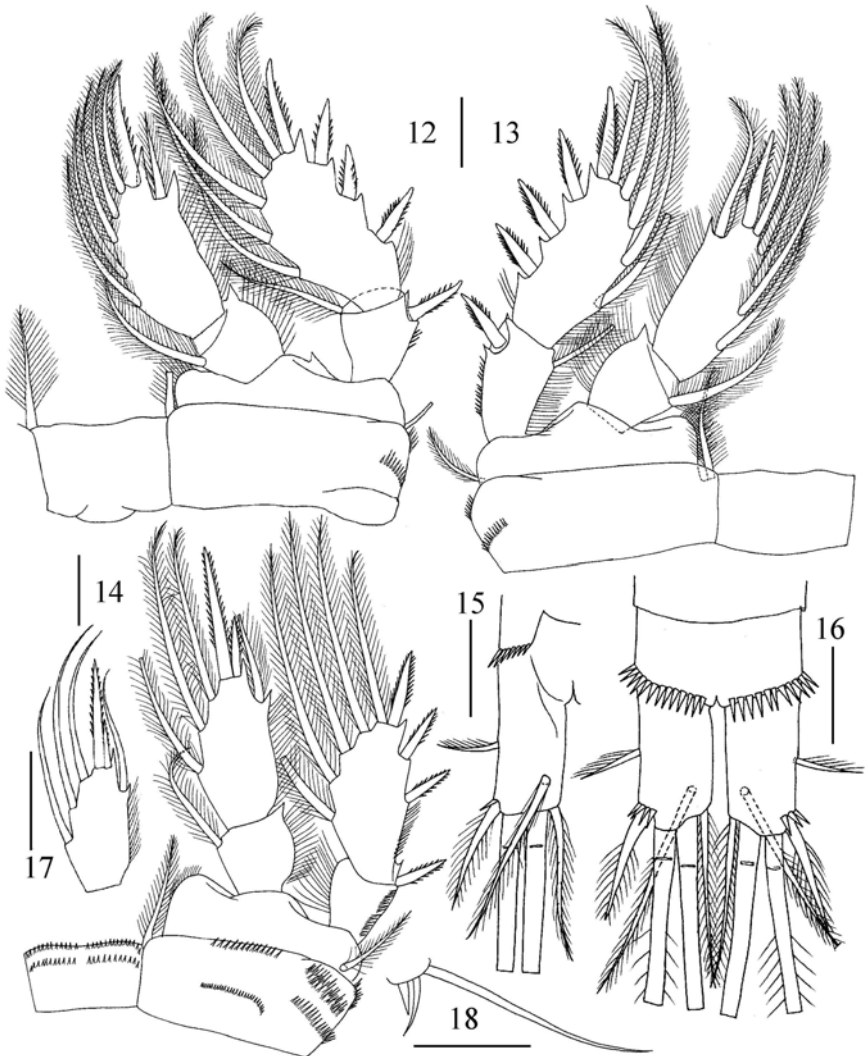
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Figs. 1-4. *Microcyclops cunningtoni* Sars, 1909, female. 1, habitus; 2, last thoracic and genital somites; 3, furcal ramus dorsally; 4, furcal ramus ventrally. Scales: 1, 50  $\mu\text{m}$ ; 2-4, 25  $\mu\text{m}$ .



Figs. 5-11. *Microcyclops cunningtoni* Sars, 1909, female. 5, antennule; 6, antenna, caudal side; 7, basipodite of antenna, frontal side; 8, maxillule; 9, maxilla; 10, maxilliped; 11, P1. Scales: 25  $\mu$ m.



Figs. 12-18. *Microcyclops cunningtoni* Sars, 1909. 12, P2 of female; 13, P3 of female; 14, P4 of female; 15, caudal rami of male, dorsally; 16, caudal rami of male, ventrally; 17, Enp3P4 of male; 18, P6 of male. Scales: 25  $\mu$ m.