

Cyclops glacialis n. sp. (Copepoda : Cyclopoida) from a High Mountain Lake in Northwestern Mongolia

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With 1 Figure and 1 Table

Key words : Taxonomy, Copepoda, *Cyclops*, Northwestern Mongolia, high mountain lake

Abstract

A new species of *Cyclops* s. str. (*strenuus* subgroup) from a high mountain lake in Northwestern Mongolia is described. As no cytological investigations were possible, the species diagnosis and taxonomic relationships were made on the basis of morphological and morphometrical data. It is most similar to *Cyclops abyssorum*, but there are clear distinguishing features.

Introduction

During 1997 to 1999 Dr. W. HORN and M. PAUL, Sächsische Akademie der Wissenschaften, AG „Limnologie von Talsperren“, investigated several freshwaters in the Uvs Nuur basin, Northwestern Mongolia as part of the scientific project „Limnologische Verhältnisse charakteristischer Gewässer im Uvs-Nuur-Becken (Nordwest-Mongolei)“, supported by DFG and GTZ. In one of eleven plankton samples, which were sent to me for identification, I found a new species of the genus *Cyclops*, which is described below.

Cyclops glacialis n. sp.

Type locality: Turgan-Charchiraa mountains, Aimak Uvs, Northwestern Mongolia (49° 49' N, 91° 16' E), Nogoön Nuur (a mountain lake in the Alpine zone, 2650 m NN), leg. W. HORN and M. PAUL, 14-08-1999.

Type material

Holotype: one undissected female (non-ovigerous) preserved in alcohol.

Allotype: one undissected male preserved in alcohol.

Paratype material: – 32 undissected specimens (eight females without eggs, 16 males and eight copepodids [stage V]) preserved in alcohol; – two dissected females (non-

ovigerous), one dissected copepodid stage V and one dissected male; all specimens mounted on four slides in glycerine.

Repositor of type material: all material is deposited in the Zoological Museum of Humboldt-University Berlin, Germany. Catalog number: ZMB 27426.

Material examined: eight females, eleven males and three copepodids stage V from type material as described above.

Description

Female. – Total body length rather short; 1.25 mm on the average (Table 1).

Table 1. Morphometrical data of *Cyclops glacialis* n. sp. (n = 8).

Total body length, female (µm)	1253	(1135–1351)
Length of abdomen	330	(304–351)
Width of thoracic somite 4	273.9	(257–281)
Width of thoracic somite 5	165.6	(211–246)
Genital segment, L : W as %	106.3	(102.7–110.5)
Length of furca	207.4	(190–224)
Furca, L : W	7.3	(6.6–7.9)
Enp ₃ P ₂ , sp ₁ : sp ₂	2.43	(2.32–2.58)
Seta 1	12.9	(11.5–15.9)
Seta 2	33.9	(31.1–39.0)
Seta 3	27.6	(22.6–33.2)
Seta 4	6.7	(6.0–7.6)
Seta 5	9.5	(8.8–10.7)
Seta 1, as % of seta 4	194.3	(151.3–235.3)
Seta 3, as % of seta 2	81.7	(69.7–90.0)
Total body length, male (µm)	1135	(1065–1193)
P ₆ , spine	26.3	(21.5–36.2)
Seta (e)	40.7	(36.2–42.9)
Seta (i)	91.5	(79.1–104.0)

Note: Values are given as mean with range in parenthesis. Width of thoracic somite 4 and 5 are given as % of total body length, seta 1–5 are given as percentages of total body length.

Antennule. – Reaching to the middle of fourth thoracic segment (Fig. 1A). The proximal segments are weakly denticulated at their inner lateral margin.

Antenna. – Basipodite with a group of five to six slender spines on outer margin near ist base (Fig. 1B). First segment with a row of fine and rather long setae on outer margin near tip of segment (Fig. 1B).

Thoracopods. – Spine formula (spines on the last segment of exopodites 1–4): 3-4-3-3.

P₄. Enp₃ 3.3 times as long as wide (Fig. 1F). Inner apical spine about 2.5 times as long as outer. Setae on both margins distinctly overreach the apical spines. Connecting lamella (Fig. 1E) on the caudal side with a few long setules in the proximal row and densely setulated in distal part, humps not or only scarcely exceeding the distal margin of lamella.

Caudal side of coxopodite with spine groups (EINSLE 1985) A-B-C-E.

P₅ (Fig. 1G). Apical segment slender, 2.5–3.0 times as long as wide; spine rather weak, extending beyond tip of segment. Seta of apical segment 1.82–2.85 times as long as seta on basal segment, usually more than twice as long.

P₆ (Fig. 1H) consists of two spines of different length and a long seta which is twice as long as the longer spine.

Cephalothorax (Fig. 1A) fairly slender, 1.25 to 1.79 times as long as wide.

Thoracic somite 4 (Fig. 1C). – The broadest part is at the middle; rarely the middle and distal part are of equal width. The margins are distally well developed but not really pointed. The width of the somite varies between 20.3 and 24.8% of total body length.

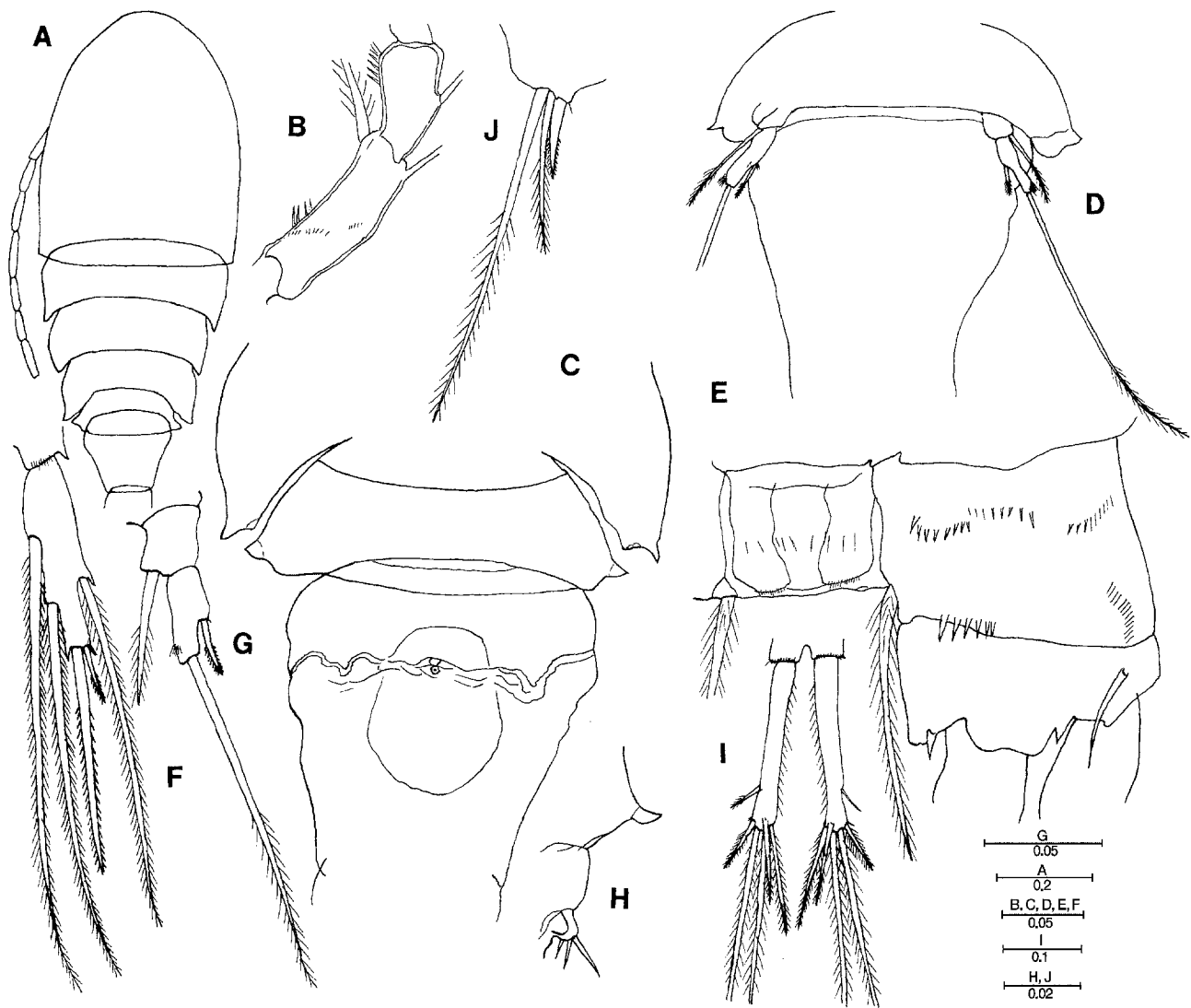


Fig. 1. *Cyclops glacialis* n. sp. (paratype), Nogoon Nuur, Mongolia. **A.** Cephalothorax, thorax and genital segment, ♀. **B.** A 2, Basipodite and first segment of endopodite, ♀. **C.** Last thoracic somites (Th 4 and Th 5) and genital segment, ♀. **D.** Last thoracic somite and genital segment, ventral view, ♀. **E.** Connecting lamella and coxo- and basipodite of P₄, caudal site, ♀. **F.** Enp₃P₄, ♀. **G.** P₅, ♀. **H.** P₆, ♀. **I.** Furca, . J. P₆ ♂.

Thoracic somite 5 (Figs. 1C and D) with short, slightly tapered lateral points; width 17.3 to 20.6% of total body length.

Genital segment (Figs. 1A, C and D) slightly longer than broad (Table 1) with the proximal part well developed laterally.

Furca (Fig. 1I). – Slightly diverged with almost continuous row of setules along inner margins. Furcal index about 7.0. Internal terminal seta (1) distinctly shorter than furcal ramus and about 1.9 times as long as the external terminal seta (4). Seta 4 rather short, about 7.0% of total body length. Dorsal seta distinctly longer than seta 4. The median internal seta and median external seta are not very different in length.

Male. – Total body length about 1.13 mm, only slightly shorter than female. P_6 (Fig. 1J) with rather long inner seta, which is about 4 times longer than the outer spine.

Variability

Measurements were taken from eight specimens (Table 1).

Total body length of females varies between 1.14–1.35 mm, of males between 1.07–1.19 mm. The length : width ratio of furcal rami of females between 6.6–7.9. The length of furcal seta 1 in relation to total body length is usually about 12.4%; in only one specimen it exceeds 15.9%. The percentage relation between seta 1 and seta 4 is rather variable, ranging from 15.1–23.5%. Spine pattern on coxopodite P_4 constant, also the length of the marginal setae on Enp_3P_4 .

Relationships

Without knowledge of the chromatin-diminution and without any molecular data, it is impossible to make a certain statement on the relationship between species within the genus *Cyclops* (EINSLE 1975, 1993). According to morphological and morphometrical features the new species is most similar to *Cyclops abyssorum* SARS 1863 in shape of thoracic somite 5, the length of setae 2 and 3 of the furca, the length relationship of seta 1 and seta 4 and the length of furcal rami. It differs from this species by the shape of thoracic somite 4, the spine pattern on coxopodite P_4 and the relative length of the marginal setae of Enp_3P_4 . Thoracic somite 4 has its broadest part at the middle of the segment; only in one female is the segment of the same width in the middle and at the ends. The spines of groups D and F on the coxopodite P_4 are lacking, whereas the spines of group B are constantly present. According to EINSLE (1993) only the Scandinavian population of *Cyclops abyssorum* is provided with spines of group B. In contrast to *C. abyssorum* the marginal setae on Enp_3P_4 surpass the inner apical spine clearly. Less major differences include the relatively short seta 1 and seta 4 of the furcal rami, which are on the average 12.9 and 13.0% of total body length in the new species, but 6.7 and 8.2% in *C. abyssorum* respectively. The inner marginal spine of P_5 is weaker than in *C. abyssorum*.

Based on the shape of thoracic somite 4 (greatest width in the middle of the segment) *C. glacialis* n. sp. is identical with *Cyclops strenuus*, but the two species are distinguishable in other features, excluding a close relationship between them. In *C. glacialis* n. sp. thoracic somite 5 is distinctly broader than the genital segment, its lateral points being long and stout, not short and knobshaped. The dorsal seta of the furcal rami is distinctly longer, not shorter than the inner apical seta. The spine pattern on coxopodite P_4 is distinguishable from that of *C. strenuus* by the presence of groups B and E and the absence of group D. In the male the longest apical seta of P_6 is longer (about three times as long as the spine).

Hitherto *C. abyssorum* was reported from Mongolia in Lake Chövgöl Nuur (KOZHOV et al. 1965) and in Lake Darchatski Kotloviny (DULMA 1965). Because of the lack of morphological and morphometrical analysis of these populations nothing can be said of their relationships to, or a possible identity with, *C. glacialis* n. sp. SARS (1903) has mentioned *C. strenuus* var. *gracilipes* from Lake Teletskoje (Altai), but without a description and without any figures. Later RYLOV (1963) denoted this population as *C. abyssorum* and noted morphometrical data of four specimens. *C. glacialis* n. sp. differs by much shorter setae of the furcal rami (with the exception of the outer apical seta), excluding identity with the Altai population.

GURNEY (1933) says: „SARS states (1913, p. 34) that *C. strenuus* var. *gracilipes* SARS (1903, p. 217) from Lake Telecki in Altai is identical with *C. abyssorum*. Specimens from Lake Telecki in the Norman Collection which are labelled (by SARS) as *C. gracilipes* are actually *C. leuckarti*. No description of this form was given by its author.” SARS must have added the wrong label. He would not confuse „*C. leuckarti*” with anything like *C. abyssorum*!

Nature of the type locality

Nogoon Nuur is an oligotrophic cirque lake with a depth of 40 m, situated in the glaciated Torgen-Charchiraa mountains at 2650 m above sea level (HORN and PAUL, pers. comm.). The lake is icefree only during a few months in the year and therefore *C. glacialis* n. sp. seems to be cold-stenothermous, having only one generation per year. During the sampling time in mid August the population consisted predominantly of copepodites stage IV and V and abundant males, whereas adult females were very rare. The crustacean plankton of Nogoon Nuur is characterized by its faunal poverty. Besides *C. glacialis* n. sp. only one Calanoid species – *Arctodiaptomus alpinus* (IMHOF) – and two species of *Daphnia* – *Daphnia pulicaria* FORBES and *Daphnia galeata* SARS – occur (FLÖBNER, HORN & PAUL, in preparation).

At present the new species is known only from the type locality. It is supposed that it occur also in other high mountain lakes in the Siberian and Central Asian highlands.

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