

A new synonym of *Halicyclops sarsi* Akatova, 1935 (Copepoda: Cyclopoida)

V.I. Monchenko

Monchenko, V.I. 2006. A new synonym of *Halicyclops sarsi* Akatova, 1935 (Copepoda: Cyclopoida). *Zoosystematica Rossica*, 14(2), 2005: 197-201.

The lectotype of *H. sarsi* Akatova, 1935 is designated and described. *H. pygmaeus* Sars, 1927 (nomen nudum) and *H. setifer* Lindberg, 1949 are placed in synonymy under *H. sarsi*.

V.I. Monchenko, Institute of Zoology, National Academy of Sciences of Ukraine, ul. B. Khmel'nitskogo 15, Kiev 01601, Ukraine. E-mail: vmon@izan.kiev.ua

Introduction

The most common cyclop of the Caspian Sea, *H. sarsi*, was described incompletely (Akatova, 1935). Subsequently, this species was included in three keys (Lindberg, 1957; Borutsky, 1960; Kun, 1968) and recorded from plankton of different parts of the Caspian Sea. The more fully described *H. setifer* was found in plankton near Iranian coast (Lindberg, 1949, 1951) and was included in keys, as well as in lists of Caspian fauna (Lindberg, 1957; Borutsky, 1960; Mor-dukhai-Boltovskoy, 1960; Kun, 1968). It was subsequently redescribed in detail from the west Caspian coast (near Derbent) (Monchenko, 1978). The comparison of the type material of *H. sarsi* with the redescription of *H. setifer* (Monchenko, 1978) showed that they refer to the same species. As it will be shown below very important diagnostic character was unnoticed, in the first description of *H. sarsi* (Akatova, 1935).

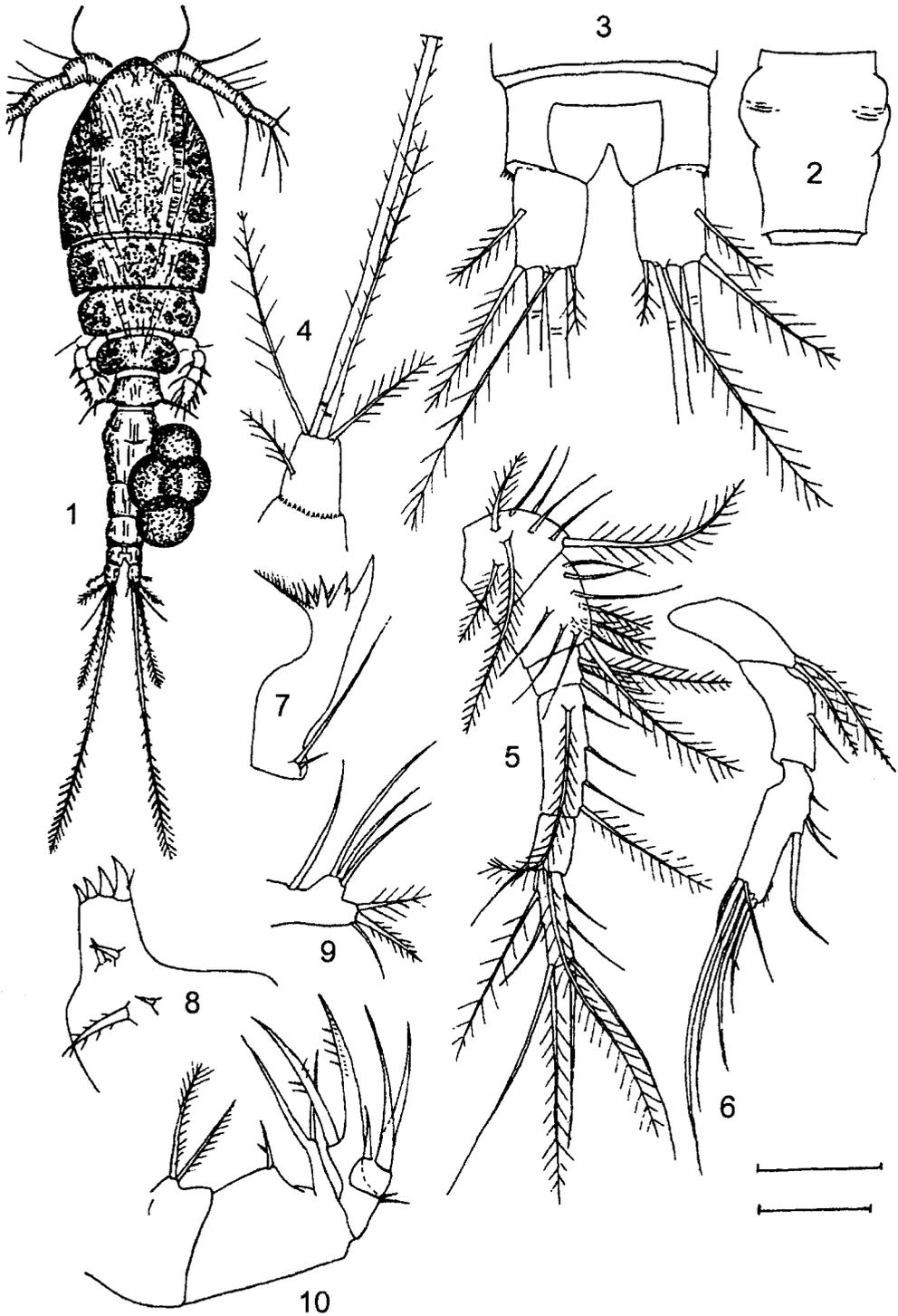
Halicyclops sarsi Akatova, 1935 (Figs 1-21)

Akatova, 1935: 320; Lindberg, 1949: 8; 1957: 144; Borutsky, 1960: 75; Kun, 1968: 171. – *setifer* Lindberg, 1949: 7, *syn. n.*; 1951: 162; 1957: 141; Borutsky, 1960: 75; Kun, 1968: 171; Monchenko, 1978: 81. – *pygmaeus* Sars, 1927: 329 (nomen nudum), *syn. n.*

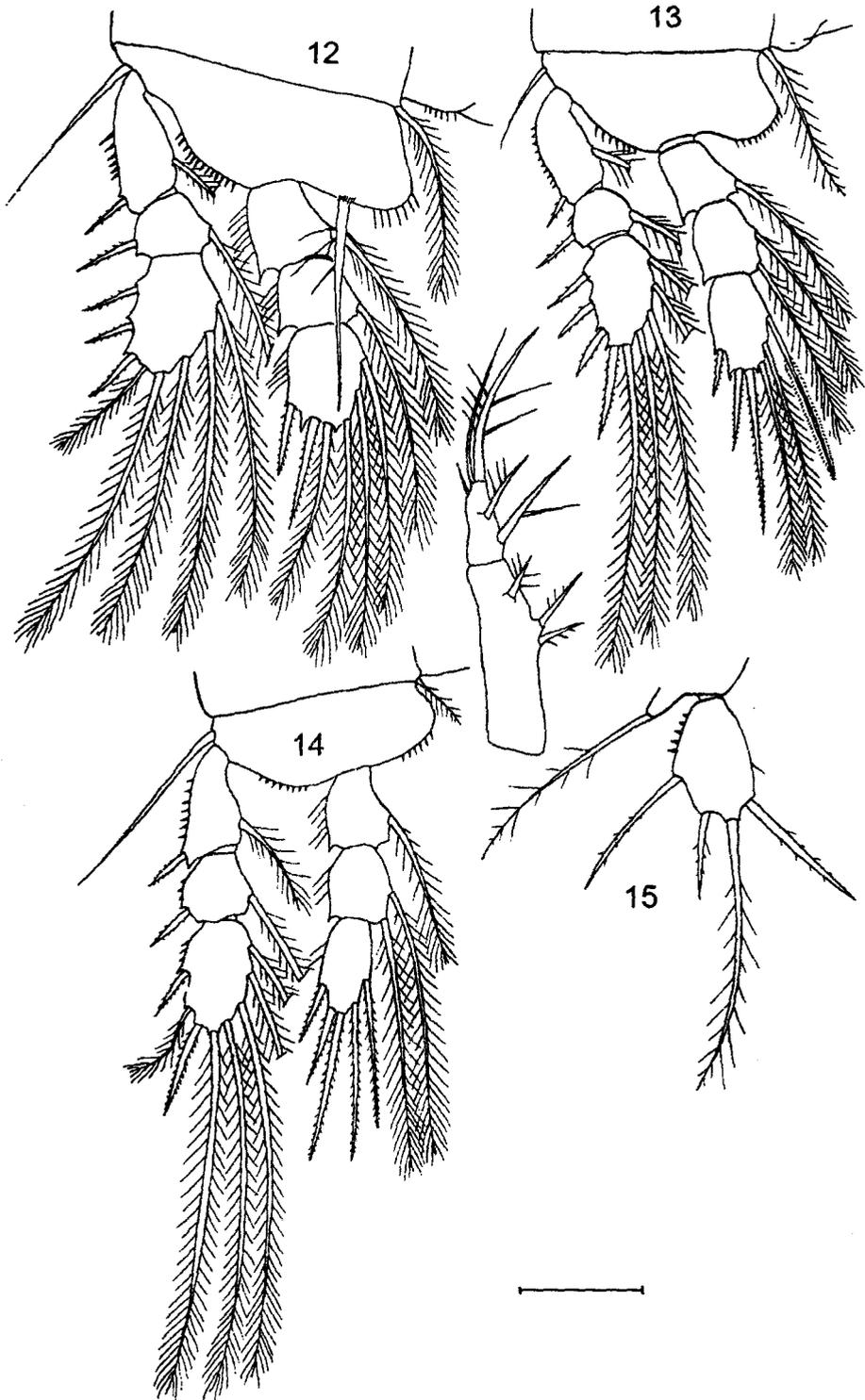
Material. *Lectotype* (present designation). ♀, dissected and mounted in glycerol-gelatin on a slide, **Caspian Sea**, gulf Mertvyi Kultuk, Spit Zhilaya, no. 488a, st. 2, 4.VI.1931 (Suvorov), deposited at Zoological Institute, St.Petersburg.

Paralectotypes. 3 ♀, the same data as in the lectotype, deposited at Institute of Zoology, National Academy of Sciences, Kiev (no. 602), 240 undissected females and males preserved in alcohol, deposited at Institute of Zoology, Kiev (no. 602) and Zoological Institute, St.Petersburg (no. 488b).

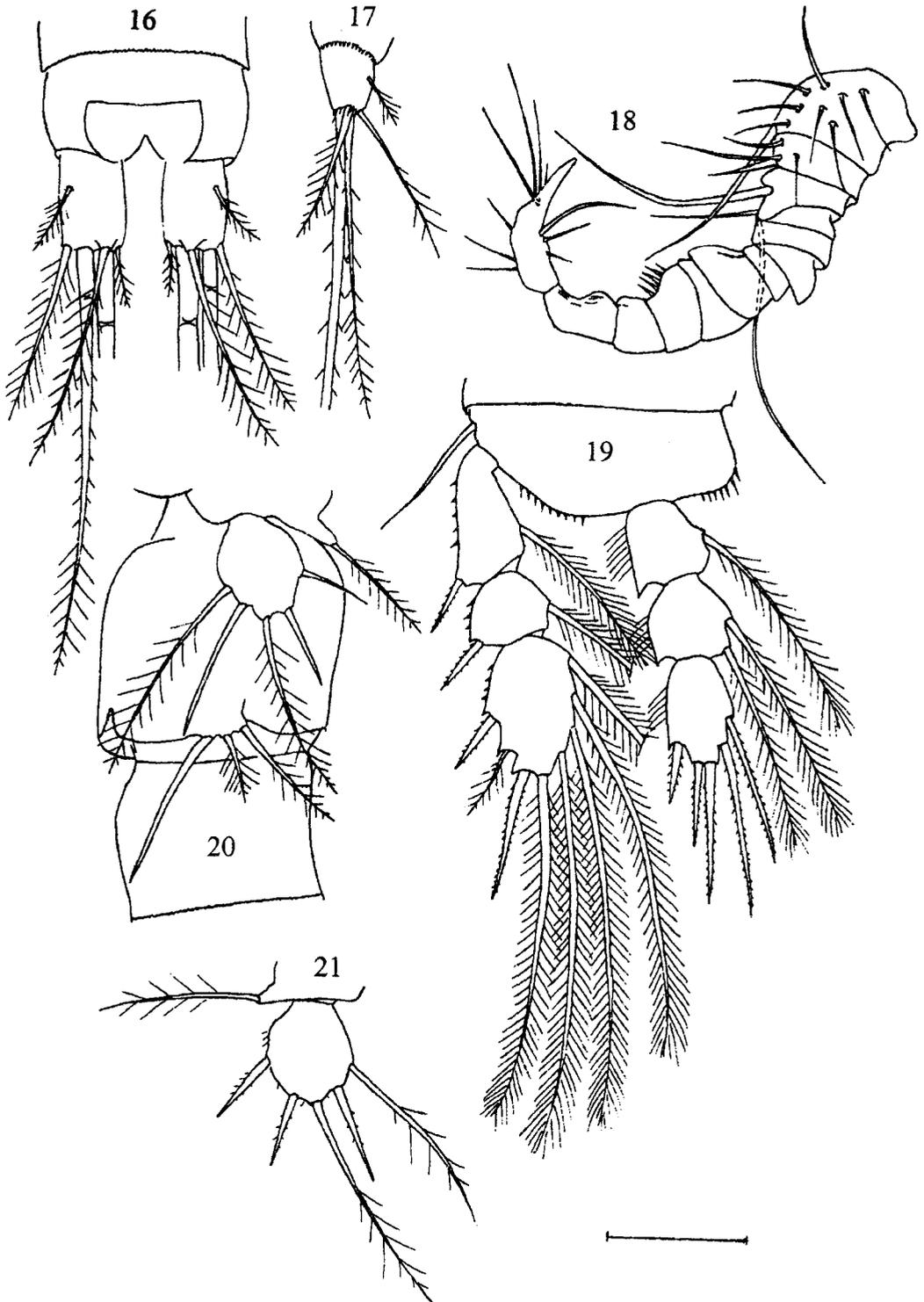
Description. *Female* (lectotype). Body length 428 µm without furcal setae. Body slender, colourless. Length of abdomen (with genital double somite) 51% of prosoma length (Fig. 1). Genital double somite as long as wide (Fig. 2), laterally broadly rounded in its anterior part, broadest in anterior half, and tapering posteriorly. Distal border of anal segment ventrally with fine denticles (Fig. 4). Caudal rami 1.4 times as long as wide (Fig. 3). Outermost apical seta twice as long as caudal rami. Length ratio of distal setae, starting with the outer seta, 1 : 2.4 : 6.5 : 0.3, i.e. innermost seta is short. Lateral seta inserted at about distal 2/5 of rami. Very long dorsal seta 3 times as long as rami and 1.8 times as long as outermost seta. Antennule (Fig. 5) 6-segmented, reaching to half of cephalosoma length, with numerous setae and other armaments from proximal to distal segments. Antenna (Fig. 6) 3-segmented, with basis bearing 2 setae at anterior corner, without exopodite-seta and surface ornamentation; endopodite segments 1 and 2 with 1 and 10 setae, respectively. Mandible surface without ornamentation; tiny palp with 2 setae (very long and very short) (Fig. 7). Maxillule (Fig. 8) with palp (Fig. 9) of common structure for the family, with 7 setae and without spinules on surface. Maxilla (Fig. 10) 4-segmented, with one minute seta on coxopodite; basal endite with two straight spines of different lengths. Maxilliped (Fig. 11) 2-segmented; prae-coxa fused with coxa bearing at whole 3 setae; all other segments also fused, with 5 setae. Swimming legs (Figs 12-14) all with 3-segmented rami. Exopodite segments 1 and 2 and endopodite segment 1 each with 1 medial seta; endopodite segment 2 of leg 1 with 1 seta, endopodite segments 2 of legs 2-4 each with 2 medial setae; each exopodite terminal segment with 5, 5, 5, 5 setae and 3, 4, 4, 3 spines, respectively. On leg 4, medial spine replaced by thin plumose seta. Legs 2 and



Figs 1-10. *Halicyclops sarsi* Akatova, female: 1, habitus, dorsal; 2, genital double-segment, dorsal; 3, caudal rami, dorsal side; 4, caudal rami, lateral; 5, antennule; 6, antenna; 7, mandible; 8, maxillule; 9, taster of maxillule; 10, maxilla. Long scale bar: 1 – 100 μm , 2 – 45 μm ; 3, 7-9 – 20 μm ; 6 – 30 μm . Short scale bar: 4, 5, 10 – 30 μm .



Figs 11-15. *Halicyclops sarsi* Akatova, female: 11, maxilliped; 12, leg 1; 13, leg 2; 14, leg 4; 15, leg 5. Scale bar: 11, 12, 14, 15 – 20 μ m; 13 – 30 μ m.



Figs 16-21. *Halicyclops sarsi* Akatova, male: 16, caudal rami, dorsal; 17, caudal rami, lateral; 18, antennule; 19, leg 4; 20, legs 5 and 6; 21, leg 6. Scale bar: 16, 19, 20, 21 – 20 μm ; 17, 18 – 30 μm .

3 of equal length, have the same armament. Distal segment of leg 4 endopodite elongate, 1.6 times as long as wide, with two straight apical spines; inner spine 1.7 times as long as outer spine and 1.6 times as long as the segment; inner setae of this distal segment modified into straight spines reaching top of nearest apical spine. Couplers of all legs without prominent paired rounded protrusions of free margins, but with small hairs on leg 1. Medial projections of basipodites of legs 1-4 with short stout hairs. Identical hairs present on outer side of exopodite segments of legs 1-4. Thin hairs present on outer margins of all endopodite segments of legs 1-4. On leg 5 (Fig. 15), segment 1 fused with 5th thoracal segment, with long lateral seta; form and armament of single free segment characteristic of genus *Halicyclops*, with very long apical plumose seta, which is twice as long as the segment.

Male. Body length of dissected specimen 367 μm . Caudal rami (Fig. 16) 1.4 times as long as wide. Outermost seta 2.5 times as long as innermost seta; dorsal seta slightly longer than outermost one (Fig. 17). Antennule (Fig. 18) 13-segmented. Middle spine on exopodite segment 3 of leg 4 modified (Fig. 19) into thin plumose seta. Distal endopodite segment of leg 4 elongate, 1.7 times as long as wide; inner apical spine 1.7 times as long as outer spine and 1.3 times as long as the segment. Leg 5 (Figs 20-21) with additional very long seta; leg 6 with strong outer spine and two setae; their length ratio, starting with outer spine, as 1 : 0.4 : 0.8 (Fig. 20).

Discussion. In the description of *H. sarsi*, Akatova (1935: 321) wrote that distal exopodite segment of leg 4 was armed "as in *H. aequoreus* and all other species of the genus"; a drawing of this exopodite was not given. However, in actuality *H. sarsi* has a rare modification of the middle spine on the last segment of leg 4 into a thin plumose seta. The same modification is known also in two other (of approximately 95 described) species of the genus; in *H. blachei* Lindberg from Cambodia (Lindberg, 1952) and *H. fosteri* Wilson from North America (Wilson, 1958; Reid, 1990, etc.).

In the list of Caspian cyclops, Sars (1927) noted *H. pygmaeus* without description. This nomen nudum obviously must be referred to the smallest Caspian *Halicyclops*, *H. sarsi*.

Acknowledgements

This work is based on the scientific collection of Zoological Institute, Russian Academy of Sciences, and Institute of Zoology, National Academy of Sciences, Ukraine. I thank curator of the hydrobiological department of the first institute, Prof. L.A. Kutikova for the opportunity to examine the material.

References

- Akatova, N.A. 1935. Drei neue Copepoden-Arten aus dem Kaspi-See. *Zool. Anz.*, 111(11/12): 319-326.
- Borutsky, E.V. 1960. *Determination keys of free-living freshwater Copepoda of USSR and neighbouring countries by fragments in fish guts*. Moscow: Acad. Sci. USSR. 218 p. (In Russian).
- Kun, M.S. 1968. Order Copepoda. In: *Atlas of invertebrates of Caspian Sea*: 160-183. Moscow: Pishcheprom. (In Russian).
- Lindberg, K. 1949. Contribution à l'étude des Cyclopidés (Crustacés, Copépodes). *K. Fysiogr. Sällsk. Lund Förhandl.*, 19(7): 1-24.
- Lindberg, K. 1951. Notes sur quelques *Halicyclops* de la mer Caspienne. Description du *H. oblongus* n. sp. et du *H. robustus* n. sp. *Medd. Zool. Mus. Oslo*, 58: 157-164.
- Lindberg, K. 1952. Cyclopidés (Crustacés, Copépodes) du Royaume du Cambodge. *Bull. Inst. roy. Sci. natur. Belg.*, 28(15): 1-16.
- Lindberg, K. 1957. Cyclopidés (Crust. Cop.) de la Côte d'Ivoire. *Bull. Inst. franç. Afrique Noire, Ser. A*, 19(1): 134-179.
- Monchenko, V.I. 1978. Second record of *Halicyclops setifer* (Crustacea, Copepoda), redescription of species and first description of males. *Dokl. Akad. Nauk Ukr. SSR*, 1978(1): 81-84. (In Russian with English summary).
- Mordukhai-Boltovskoy, F.D. 1960. *Caspian fauna in Azov-Blacksea basin*. Moscow & Leningrad: Izd. Akad. Nauk SSSR. 288 p. (In Russian).
- Reid, J.W. 1990. Continental and coastal free-living Copepoda (Crustacea) of Mexico, Central America and the Caribbean region. In: *Diversidad Biologica en la Reserva de la Biosfera de Sian Ka'an Quintana Roo, Mexico*: 175-213.
- Sars, G.O. 1927. Notes on the Crustacean-fauna of the Caspian Sea. In: *Sbornik v chest' professora Nikolaya Mikhailovicha Knipovicha. 1885-1925* [The book in honour of Professor N.M. Knipovich. 1885-1925]. Moscow: 315-329.
- Wilson, M.S. 1958. The copepod genus *Halicyclops* in North America with description of a new species from Lake Pontchartrain, Louisiana, and the Texas Coast. *Tulane Stud. Zool.*, 6(4): 176-189.

Received 30 April 2005