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Studies on Littoral Copepods in Mikawa Bay and Adjacent Waters

I. Description of a new species of the genus *Cyclopina*

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Synopsis

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A new species of cyclopoid copepod, *Cyclopina kiraensis*, is described and illustrated on the specimens collected from intertidal area near the mouth of the Yahagi-furukawa River in Mikawa Bay, the Pacific coast, Central Japan. The species is most closely related to *C. esilis* BRIAN, 1928, but differs from it in the structure of antenna, mandible, swimming legs 4 and 5, and other diagnostic particulars.

There have been few studies on the copepod fauna of estuaries and/or littoral regions in Japan. Since 1982, faunistic and ecological studies of animal communities in these regions have been carried out as a comprehensive work in our laboratory. The present author participated in the study of copepods which were one of the most predominant members of the fauna. In the present paper as the first report of serial works a new species of *Cyclopina* of the family Cyclopinidae is recorded from Mikawa Bay.

Cyclopina kiraensis sp. nov.

(Figs. 1-4)

Material examined. Collections were made from intertidal areas of the mouth of the Yahagi-furukawa River (Lat. 34°46'N; 137°03'W) in Mikawa Bay, April 2, 1983. Specimens were collected by pumping from the near bottom, then water was filtered with a 100- μ m mesh plankton net. 100 females and 50 males were examined.

Type series. Six females and six males are deposited in the National Science Museum, Tokyo. Holotype: Female (NSMT-Cr 8959). Allotype: Male (NSMT-Cr 8960). Paratypes: 5 females and 5 males (NSMT-Cr 8961).

Description. Female. Based on an ovigerous female of 0.717 mm

in body length excluding furcal setae. Body of usual cyclopoid form (Fig. 1 a, b); prosome elliptical, greatest width slightly exceeding half the length, front evenly rounded. Head weakly separated from first thoracic segment. Urosome about two-thirds the length of prosome. Genital segment as wide as fifth thoracic segment anteriorly, then narrowed posteriorly, being about as long as two succeeding segments combined; genital segment with one transverse fissure on dorsal surface. Genital and two abdominal segments furnished with a row of fine spinules ventrally along distal borders (Fig. 1 c, d). Furcal ramus about three times as long as the greatest width, sublinear in form and only slightly diverging, being generally longer than anal segment; furnished with one outer marginal seta attached in front of the middle of ramus and with five terminal setae, outermost one shortest, one short seta on dorsal edge. Distal border of rami with a row of fine spinules ventrally.

Antennule (Fig. 1 e) 10-segmented, extending to posterior end of head; sixth segment longest with one short aesthetasc, apical three segments about equal in length, one strong aesthetasc on anterior edge of terminal segment.

Antenna (Fig. 1 f) 4-segmented; first segment with two long plumose setae, third one shortest, terminal one tipped with six geniculate spines.

Mandible (Fig. 2 a); coxa-basis slightly tapering distally, with one seta on inner-distal edge; endopodite 2-segmented; first segment with three relatively short setae, second one with six setae; exopodite 4-segmented; first three segments each with one long seta on antero-distal edge, fourth segment with two long setae apically, one of which is remarkably furnished with a tuft of hairy setae on tip.

Maxillule (Fig. 2 b); coxa well-developed masticatory lobe with nine strong claws; basis bilobated inwards, each lobe with three and two setae; one long plumose seta and one hairy seta on outer edge; exopodite subquadrangular in form with four plumose setae on outer distal end, penultimate seta being relatively short, tipped with a tuft of hairy setae; endopodite slightly smaller than exopodite, with seven setae in all, two outermost setae plumose.

Maxilla (Fig. 2 c); coxa rather stout, with four endites; basis forming a pectinate strong claw; endopodite 3-segmented; third one represented by a very small protuberance, indistinctly separated from second one, with five terminal setae in all.

Maxilliped (Fig. 2 d); coxa with three endites; basis with hairy setae along inner edge and two spinulose setae on subdistal corner; endopodite 4-segmented; small and decreasing in size distally, first two segments bare, third one with one seta, fourth one with three apical setae.

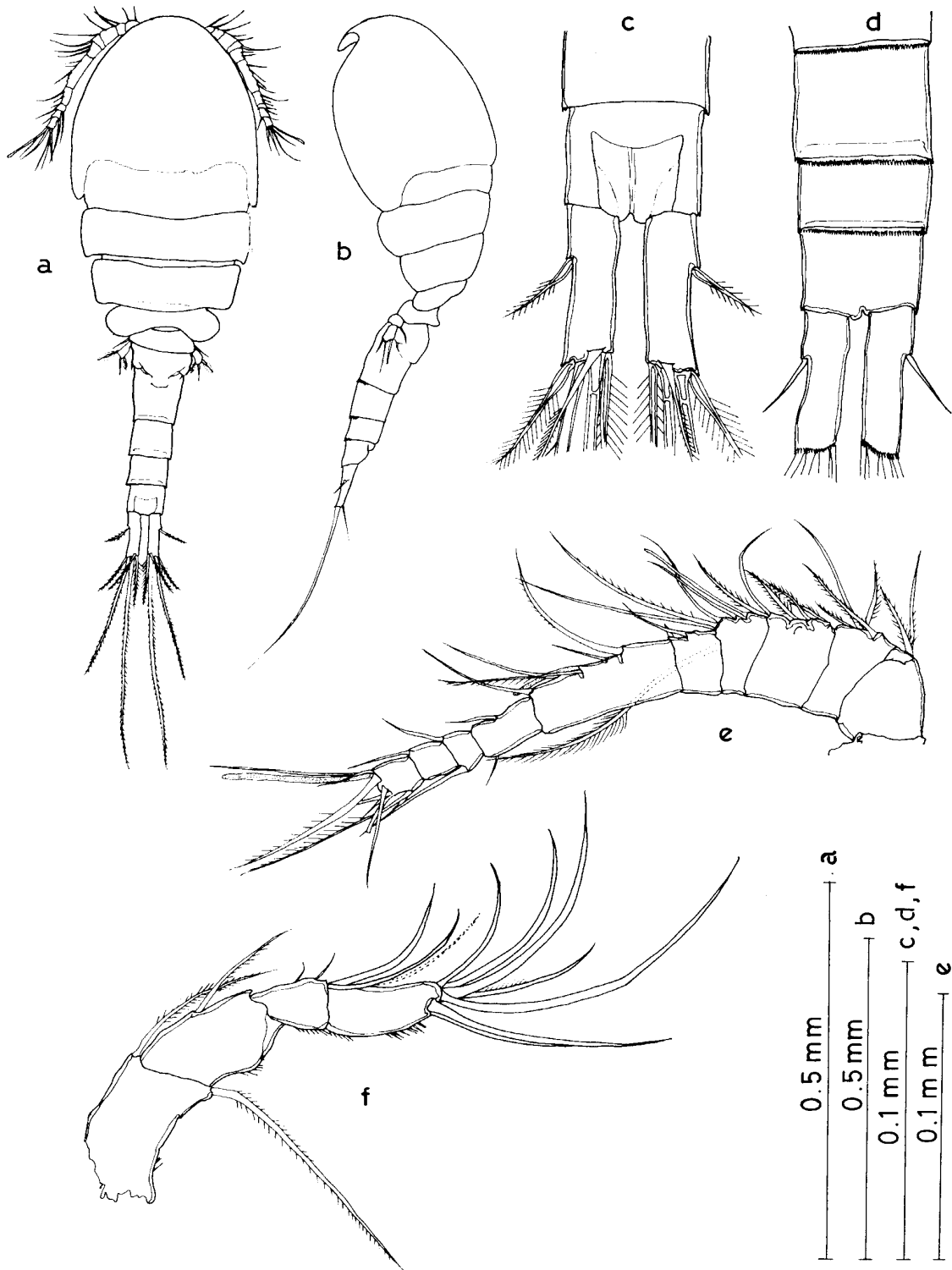


Fig. 1. *Cyclopina kiraensis* sp. nov., female; a, dorsal view; b, lateral view; c, abdomen in dorsal view; d, abdomen in ventral view; e, antennule; f, antenna.

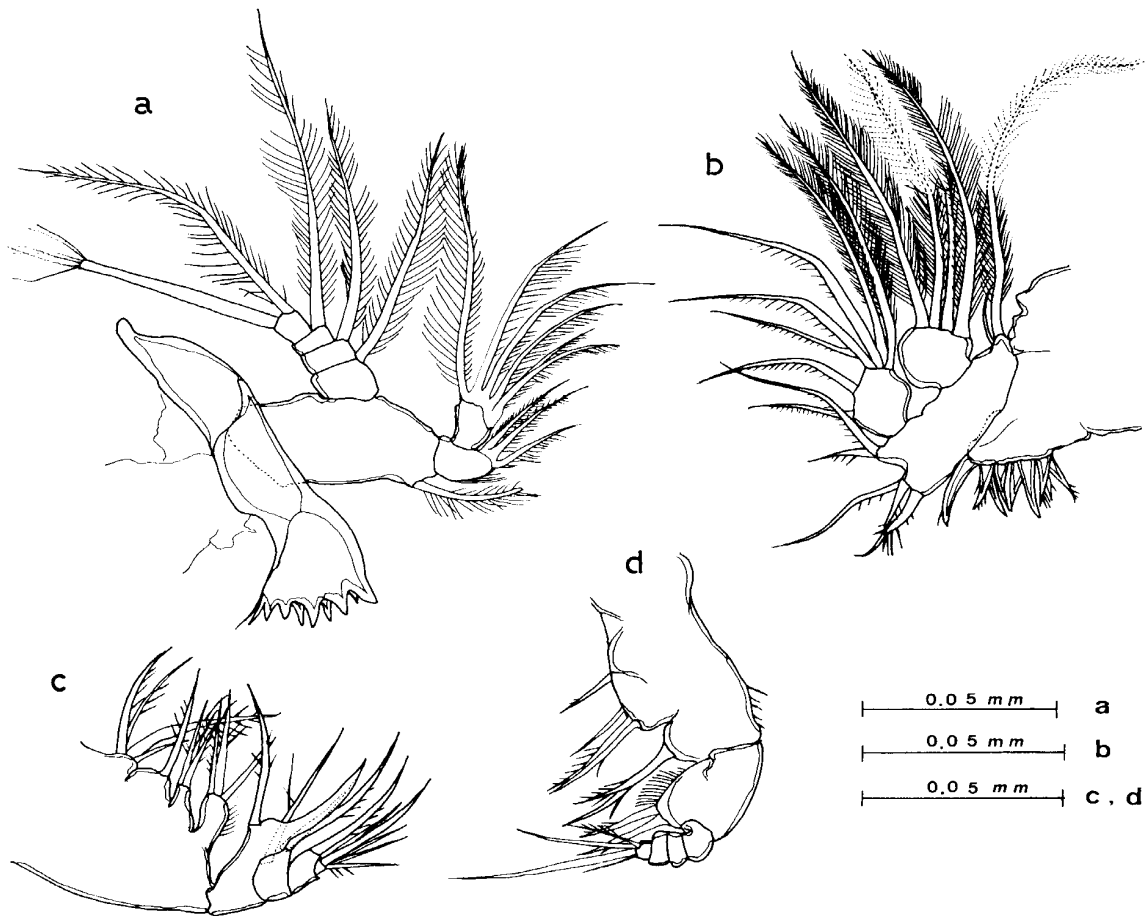


Fig. 2. *Cyelopina kiraensis* sp. nov., female; a, mandible; b, maxillule; c, maxilla; d, maxilliped.

Swimming legs (Fig. 3 a-e) with one thick inner seta and one hairy outer seta on each coxa and basis, respectively. Intercoxal plates rather quadrangular in form and bare. Legs 1-4 with 3-segmented rami with the following numbers of spines and setae on distal segments:

	Leg 1		Leg 2		Leg 3		Leg 4	
	Exp	Enp	Exp	Enp	Exp	Enp	Exp	Enp
Spines	4	0	4	0	4	0	3	0
Setae	4	6	5	6	5	6	5	5

Basis of leg 1 with one broad and fringed spine on inner distal edge; first two exopodite segments and proximalmost part of third one fringed along outer margin; legs 2 and 3 fringed along outer margin of distal exopodite segment; leg 4 a little smaller than leg 2; two inner setae on second endopodite and one inner seta on the distal endopodite one with

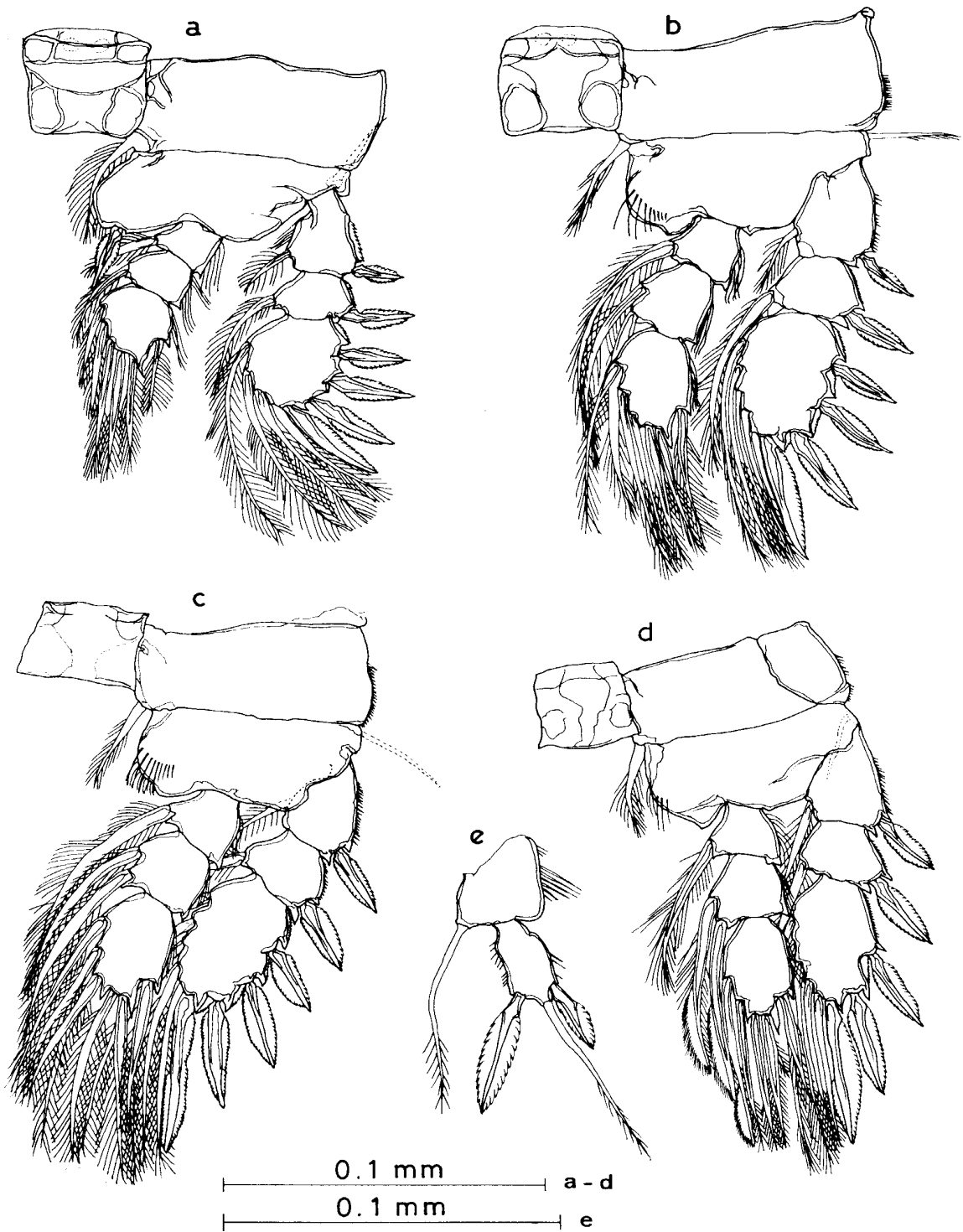


Fig. 3. *Cyclopina kiraensis* sp. nov., female; a, leg 1; b, leg 2; c, leg 3; d, leg 4; e, leg 5.

a remarkable fringe-like serrate membrane.

Leg 5 (Fig. 3 e) 2-segmented and inserted on ventro-lateral corners of thoracic segment; first segment small and rather rectangular with one long seta on outer-distal edge, furnished with hairy setae along inner margin; second one rather oblong in form, slightly tapering proximally, about twice as long as greatest width, furnished with short hairy setae along both edges; with two lanceolate fringed spines distally and one long filiform seta terminally; outer spine about 1.5 times as long as inner one.

Male. Based on a mature male of 0.497 mm in body length without furcal setae. Body more slender and shorter than that of female (Fig. 4 a); prosome narrow oblong in form, front evenly rounded. Head fused with the first thoracic segment. Urosome about two-thirds the length of prosome. Genital segment widest laterally. Abdomen 4-segmented, each segment subequal in length.

Antennule as shown in figure (Fig. 4 b) haplocer, 14-segmented.

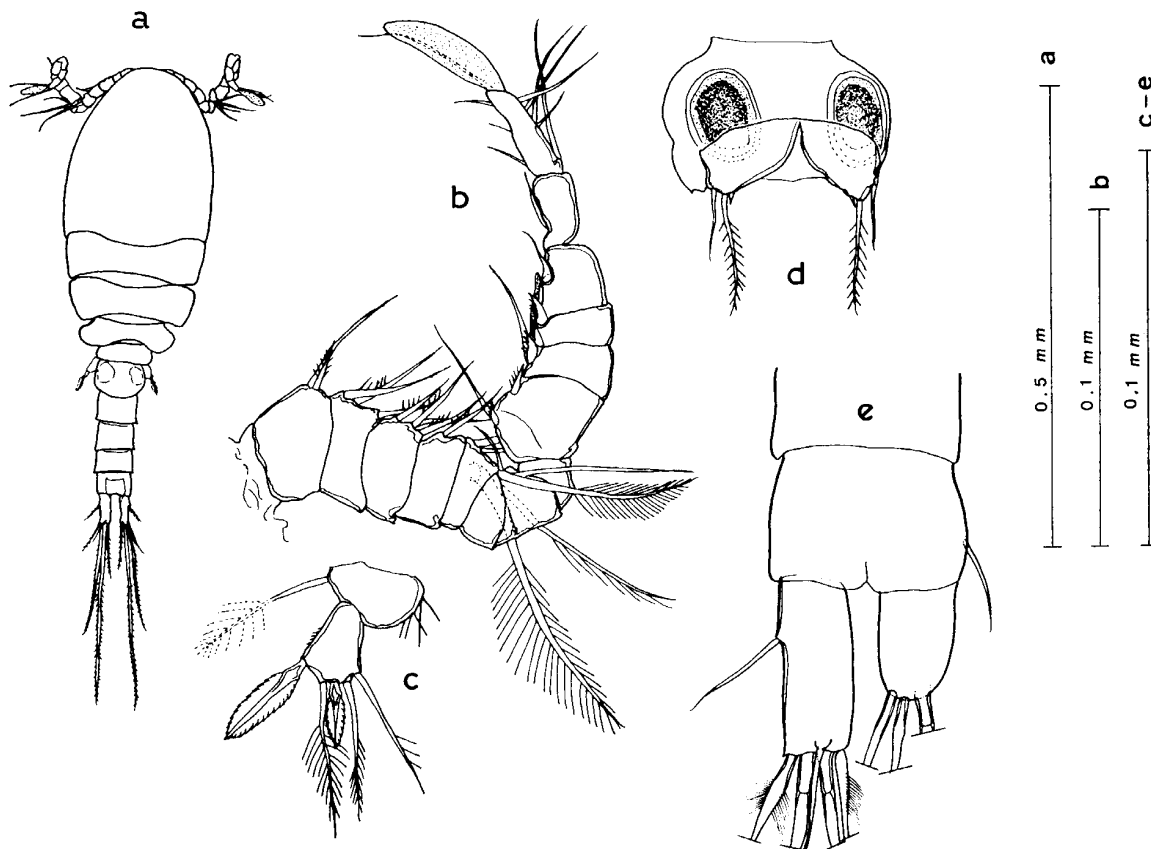


Fig. 4. *Cyclopina kiraensis* sp. nov., male; a, dorsal view; b, antennule; c, leg 5; d, leg 6; female; e, furcal rami of another one specimen.

Table 1. Extent and variability of length of body and furcal rami, the length to width ratio of furcal rami within a population of *Cyclopina kiraensis* sp. nov.

	Mean	Range	S.D.	No. of samples
Body length (mm)				
female	0.665	0.601-0.747	0.026	100
male	0.469	0.446-0.495	0.011	50
Furcal length of female (mm)				
right	0.054	0.048-0.057	0.002	30
left	0.055	0.048-0.063	0.002	30
Length to width ratio (female)				
right	3.10	2.75 -3.25	0.127	30
left	3.15	2.75 -3.60	0.143	30

Antenna, oral appendages and swimming legs 1-4 are like those of female.

Leg 5 (Fig. 4 c) also similar, but the terminal segment shorter, slightly diverging distally, with three long filiform setae in all, two of which are on inner subdistal corner.

Leg 6 (Fig. 4 d) represented by a broad plate furnished with two long setae and one very short spine-like seta; middle one longest and plumose, outermost one hairy and bare.

Variability and abnormality. No any particular difference was detected among the specimens, except for body length and the length to width ratio of furcal ramus (Table 1). Relatively large variations occurred in the latter character among 30 females measured and even between a pair of furcal rami in a single individual. In one female specimen, furcal rami remarkably showed asymmetry (Fig. 4 e); the right ramus considerably shortend and further, one lateral seta attached to the anal segment instead of the ramus.

The peculiar armature of inner marginal setae on endopodite of leg 4 in both sexes, which is also known in *Cyclopina ensifera* GRANDORI (see figure by PETKOVSKI, 1955), shows no variation among specimens examined.

Remarks. The new species here described is most closely related to *Cyclopina esilis* BRIAN, 1928 in the relative lengths of the inner and outer spines of leg 5 and the length to width ratio of the furcal rami, but easily distinguishable from it in the following particulars; 1) much bigger size, 2) separation of head and first thoracic segment in female, 3) presence of a row of fine spinules on ventro-distal borders of abdominal segments and furcal rami, 4) first segment of antenna with two setae (instead of one), 5) first endopodite of the mandible with three setae (instead of four), 6) peculiar armature of the terminal setae of

the mandibular exopodite, 7) peculiar armature of inner marginal setae of the second and third segments of leg 4, and 8) relative length of the outer spine to inner one of leg 5 (1.5 instead of 2.5–3.0), according to the figures by BRIAN (1938) and the redescription by MONCHENKO (1979).

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摘 要

広海十朗 (日本大学農獣医学部)——三河湾および隣接海域沿岸帯の橈脚類に関する研究 I. *Cyclopina* 属の 1 新種の記載.

愛知県三河湾の矢作古川河口域で、キクロピニド科の橈脚類 1 種が多数発見された。この種は、地中海などから知られる *Cyclopina esilis* BRIAN にもっとも近いが、より大型で、さらに第 2 触角、上顎、第 4 ならびに第 5 遊泳肢などの構造にも明瞭な差違が認められたので、*C. kiraensis* という新名を与えて記載した。

References

- BRIAN, A. 1938. Description d'une nouvelle espèce de copépode cyclopoïde du genre *Cyclopina*. *Bull. Zool. France*, **63**: 13–18.
- MONCHENKO, V. I. 1979. The second finding of *Cyclopina esilis* BRIAN (Crustacea, Copepoda) and redescription of the species. *Dopov. Akad. Nauk Ukr. PCP*, (B), **5**: 385–389. (In Russian with English abstract.)
- PETKOVSKI, T. K. 1955. IV Beitrag zur Kenntnis der Copepoden. *Acta Mus. Maced. Sci. Natur.*, **3**: 71–104.

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