

# A New Cyclopinid Species of the Rarely Known Genus *Cyclopinopsis* (Copepoda, Cyclopinidae) from Korea

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## ABSTRACT

A new species belonging to the genus *Cyclopinopsis* Smirnov, 1935 (Cyclopinidae) is described from Korea, as the third species of the genus. Specimens were collected by washing the subtidal sediments off Dokdo Island in the East Sea and the intertidal sands at Baegripo beach, Taean Peninsula on the Yellow Sea coast. *Cyclopinopsis deformata* n. sp. is characteristic and distinguished from its two congeneric species currently recognized, *C. curticauda* Smirnov, 1935 and *C. brasiliensis* Herbst, 1955 in having a deformed seta at the outer distal corner of the third exopodal segment of leg 4. The seta is supposed to be deformed from an outer spine on the third exopodal segment of leg 4, which has been known as completely lost in the genus until now. A character comparison table of the three species and a key to species of the genus *Cyclopinopsis* are provided herein.

**Keywords:** description, Dokdo Island, interstitial, key, meiobenthos, new species

## INTRODUCTION

Cyclopinids are widely distributed in the marine environment from polar to tropical seas and from shallow coastal waters to the deep sea; they are typically benthic, living on or near the sea bed (Boxshall and Halsey, 2004). Especially, as mentioned in the previous paper of the junior author (CYC), “cyclopinid copepods are an important group in the marine epibenthic or interstitial fauna, and are frequently found at beaches and sublittoral sandy bottom” (Chang, 2011). However, the taxonomic study of them in Korea is still poor notwithstanding some recent exertions for clarifying the marine cyclopoid fauna (Chang, 2011; Karanovic, 2014; Lee and Chang, 2015). As a cyclopinid species belonging to the family Cyclopinidae, *Cyclopinoides orientalis* Chang, 2011 is the only one recorded from Korean sea as yet.

During the examination of cyclopinid specimens obtained from the continual field surveys in the Korean seacoasts during the last ten years, we found a new species belonging to the rarely known genus *Cyclopinopsis* from the subtidal sediments off Dokdo Island in the East Sea (= Sea of Japan) and the intertidal sands at Baegripo beach, Taean Peninsula

in the Yellow Sea.

The genus *Cyclopinopsis* was established for designating a new species, *C. curticauda* Smirnov, 1935, collected from Kamchatka, the far-eastern Russian sea (Smirnov, 1935). As the type species of *Cyclopinopsis* was described rather insufficiently and inadequately, moreover, with only a few illustrations, so its genuine identity remains still unclear in spite of the succeeding description of the second species, *C. brasiliensis* Herbst, 1955 from Brazil. We conduct herein a detailed description of the third species of the genus, with a character comparison table among the three species hitherto known and a key to species of the genus *Cyclopinopsis*.

## MATERIALS AND METHODS

Samplings were performed from the littoral sandy sediments off Dokdo Islands in the East Sea (= the Sea of Japan) by SCUBA divers and along the lower-water line of Baegripo beach, Taean Peninsula in the Yellow Sea. In the field, upper 5–10 cm of sediments were scooped into polyethylene vinyl bags or 500-mL plastic bottles. Sandy sediments gathered into

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several buckets were filtered through a hand net with a mesh size of 64  $\mu\text{m}$ . Samples were fixed immediately by adding about 10% solution of buffered formalin.

In the laboratory, copepods were sorted out with a micropipette under a zoom-stereomicroscope (Leica M165C, Wetzlar, Germany) at 20–120 $\times$  magnifications, and transferred into about 80% ethanol. Selected copepod specimens were soaked and mounted in lactic acid on H-S slide (Shirayama et al., 1993) for double-coverglass preparation. Drawings and measurements were conducted at 1,000 $\times$  magnification using a drawing tube mounted on a differential interference contrast microscope with Nomarski optics (Olympus BX53, Japan).

Type specimens are deposited at the Marine Interstitial fauna Resources Bank (MInRB) of Korea Institute of Ocean Science & Technology (KIOST), Busan, Korea. Two additional specimens are kept in the author's (CYC) research collection at the specimen room of the Department of Biological Science, Daegu University (DB), Korea.

## SYSTEMATIC ACCOUNTS

Order Cyclopoida Burmeister, 1834  
Family Cyclopinidae Sars G.O., 1913  
Genus *Cyclopinopsis* Smirnov, 1935

### *Cyclopinopsis deformata* n. sp. (Figs. 1–3)

**Type locality.** Korea: Gyeongsangbuk-do, Uleung-gun, Dok-do Islands, among subtidal sediments (25 m in depth) near Cheonjang-gul Rock (37°14'25.61"N, 131°52'20.10"E).

**Type material.** Holotype: ♀ (MInRB-Cy01-L001), undissected and preserved in 80% ethanol. Paratypes: 1 ♀ (MInRB-Cy01-L002), undissected and preserved in 80% ethanol; 2 ♀ ♀ (MInRB-Cy01-S001–002), dissected, mounted in glycerine on H-S slide. All type specimens were collected by Rho HS on 24 Aug 2016 from the type locality.

**Additional material examined.** 1 ♀ (MInRB-Cy01-L003), undissected and preserved in 80% ethanol; 1 ♀ (ovigerous, MInRB-Cy01-S003), 2 ♀ ♀ (DB20053, 20054), dissected, mounted in glycerine on H-S slide, Baegripo beach, Taean-gun, Chungcheongnam-do, Korea, 9 Aug 2009, Lee J.

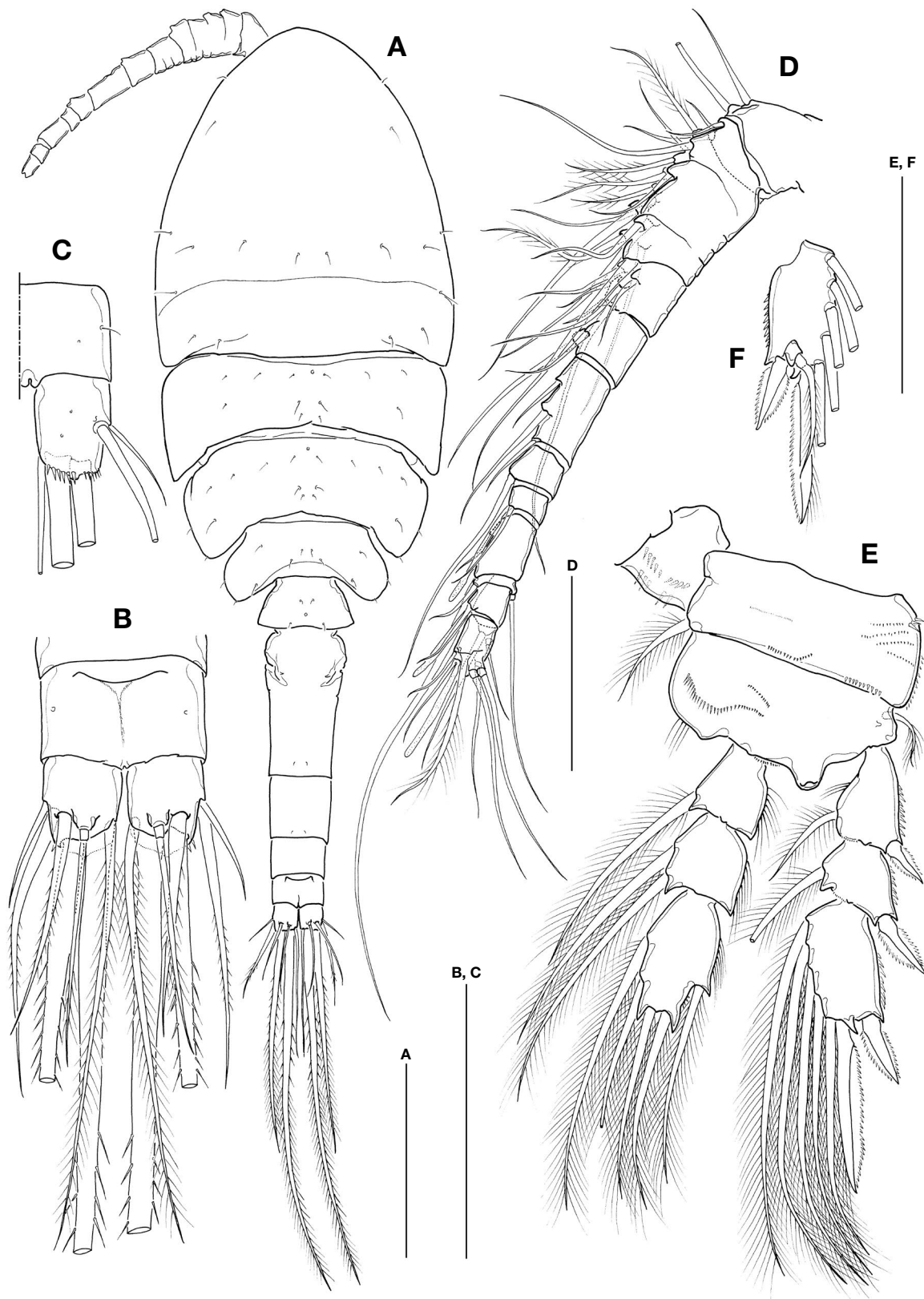
**Description of female.** Body (Fig. 1A) slender, rather small; length of dissected and described paratype specimen 467  $\mu\text{m}$ , excluding caudal seta; body length of other seven specimens measured ranging 429–507  $\mu\text{m}$  (mean 465  $\mu\text{m}$ ,  $n=7$ ); body length/width ratio about 2.4. Color of preserved specimens in ethanol tinged with milky white. Rostrum not discernible in dorsal view. Nauplius eye invisible.

Prosoma nearly ellipsoidal, about 282  $\mu\text{m}$  long, 1.6 times

longer than urosome, consisting of cephalothorax and 3 pedigerous somites; greatest width of prosoma 155  $\mu\text{m}$  at near posterior margin of cephalothorax, length/width ratio 1.8. Cephalosome and first pedigerous somite incompletely fused into cephalothorax, remaining faint trace of segmentation dorsally, with weak angular posterolateral corners; about 1.5 times longer than sum of next prosomites. Second and third pedigerous somites almost equal in length; armed with 2 rows of sesilla on dorsal surface, as shown in Fig. 1A. Fourth pedigerous somite distinctly shorter, with round posterolateral corners, heading outer posteriorly. Urosome slender, 5-segmented, not ornamented with spinular or serrated hyaline fringe along posterior margin of each somite. Fifth pedigerous somite trapezoid, broadened distally, 48  $\mu\text{m}$  wide at posterior margin, with angular posterolateral corners. Genital double-somite slender, 1.85 times as long as wide, not remarkably swollen at anterior part, gradually narrowing posteriorly; genital aperture located dorsolaterally at anterior third of double-somite length. Three free abdominal somites smaller posteriorly. Anal operculum (Fig. 1B) positioned anteriorly on dorsal surface of anal somite, with smooth and gently convex posterior margin.

Caudal rami (Fig. 1B, C) nearly parallel, as long as anal somite (in ventral view); ramus appeared shorter than wide in dorsal view, but slightly longer than wide in ventral view, 1.1–1.2 times as long as wide, armed with 14–18 spinules along posterior margin of ventral side, lacking hairs or setules along medial margin; 2 pores seen nearly in the middle of ventral surface. Caudal setae consisting of typical 7 setae. Lateral caudal setae (caudal seta I, II) inserted near middle of lateral margin of ramus; seta I ventral, weakly pinnate, about 2.5 times longer than seta II, slightly longer than outer caudal seta (seta III). Outer caudal seta situated rather dorsally, lateral to dorsal seta; slightly shorter than dorsal seta. Inner terminal seta (seta V) slightly longer than urosome, about 1.7 times longer than outer terminal seta (seta IV). Inner caudal seta (seta VI) slender, plumose, 1.8–1.9 times longer than outer caudal seta, slightly longer than ramus. Dorsal caudal seta (caudal seta VII) plumose, issuing from socket-like protuberance, about 2.5 times longer than caudal ramus.

Antennule (Fig. 1D) short, slightly longer than half the length of cephalosome, but not reaching to its midway. Comprising 13 segments, in case counted distinctly divided segments only; segmentation incomplete between second and fifth segments, manifesting faint traces of subdivision along posterior border, each of 3, 2, 3 feeble subdivisions, respectively. Seventh segment longest, 1.25 times as long as wide; 11th segment minute. Setal formula: 1-[3], 2-[6], 3-[6], 4-[4], 5-[6], 6-[2], 7-[3], 8-[1], 9-[1 + aesthetasc], 10-[2], 11-[2], 12-[1 + (1 + aesthetasc)], 13-[6 + (1 + aesthetasc)]. Most of setae naked, except several plumose setae of second to fourth



**Fig. 1.** *Cyclopinopsis deformata* n. sp., female. A, Habitus, dorsal; B, Anal somite and caudal rami, dorsal; C, Anal somite and caudal ramus, ventral; D, Antennule; E, Leg 4, anterior; F, Third exopodal segment of leg 4, posterior. Scale bars: A=100  $\mu$ m, B-F=50  $\mu$ m.

and last segments. Aesthetascs rather short, issuing from anterodistal corner of ninth, twelfth, and last segments.

Antenna (Fig. 2A) slender, distinctly 4-segmented, consisting of coxobasis and 3-segmented endopod. Coxobasis about 3 times as long as wide, with 1 long pinnate seta at inner distal corner; exopodal seta short, basally pinnate, flanking 1 vestigial, slender, naked seta inner distally; outer margin with row of minute spinules. First endopodal segment about 2 times as long as wide; bearing 1 plumose seta at middle of inner margin; outer margin slightly swollen. Second endopodal segment narrow proximally and gradually broadened distally, similar in length as preceding segment; armed with 1 short, slender seta near proximal quarter of inner margin and 4 inner distal setae (3 naked and 1 geniculate); outer margin with row of minute setules on outer distal corner. Third endopodal segment elongate, about 1.3 times as long as wide, ornamented with 1 spinule row on outer distal margin, bearing 7 unequal setae apically, including 4 geniculate and 3 naked setae.

Mandible (Fig. 2B) consisting of coxa and biramous palp; palp comprising basis, 2-segmented endopod and 3-segmented exopod. Coxa armed with well-developed gnathobase; its cutting margin of gnathobase with 6 strong teeth, several setules among teeth, and one slender pinnate seta posterior distally. Basis elongate, bearing 1 seta medially, ornamented with spinule rows medially and outer distally. Endopod 2-segmented; first endopodal segment elongate, about 3.5 times longer than wide, with 2 medial plumose setae; second endopodal segment short, with 6 setae, including 3 medial and 3 apical setae. Exopod distinctly 3-segmented; first and second exopodal segments each with 1 plumose seta inner distally; last segment small, with 3 slender setae apically.

Maxillule (Fig. 2C), syncoxa well-developed, with 10 unequal spinous elements on praecoxal arthrite; epipodite with 2 strong plumose setae. Basis representing 2 basal endites medially, each bearing 2 spinous + 1 naked setae and 1 plumose seta, respectively. Endopod 2-segmented; first segment armed with 2 plumose setae medially; second segment short, with 4 long setae apically. Exopod 1-segmented, slightly longer than endopod, armed with 1 long, strong, pinnate subapical seta and 6 naked apical setae.

Maxilla (Fig. 2D) 6-segmented (praecoxa and coxa incompletely fused). Praecoxa with 2 protrusions representing endites; proximal endite armed with 1 long pinnate seta and 2 short spines, distal endite with 1 pinnate seta. Coxa with 2 endites, each bearing 2 pinnate setae and 1 sharp, strong, spiniform element. Basis forming 1 stout, bipectinate claw, proximally unarticulated, flanking 1 short, naked seta basally. Endopod 3-segmented, becoming smaller distally; first endopodal segment with 2 long, pinnate, distally-geniculate setae (1 proximal and 1 subdistal); second endopodal segment

with 2 stout, geniculate setae; third endopodal segment minute, bearing 4 setae (1 long and 3 short).

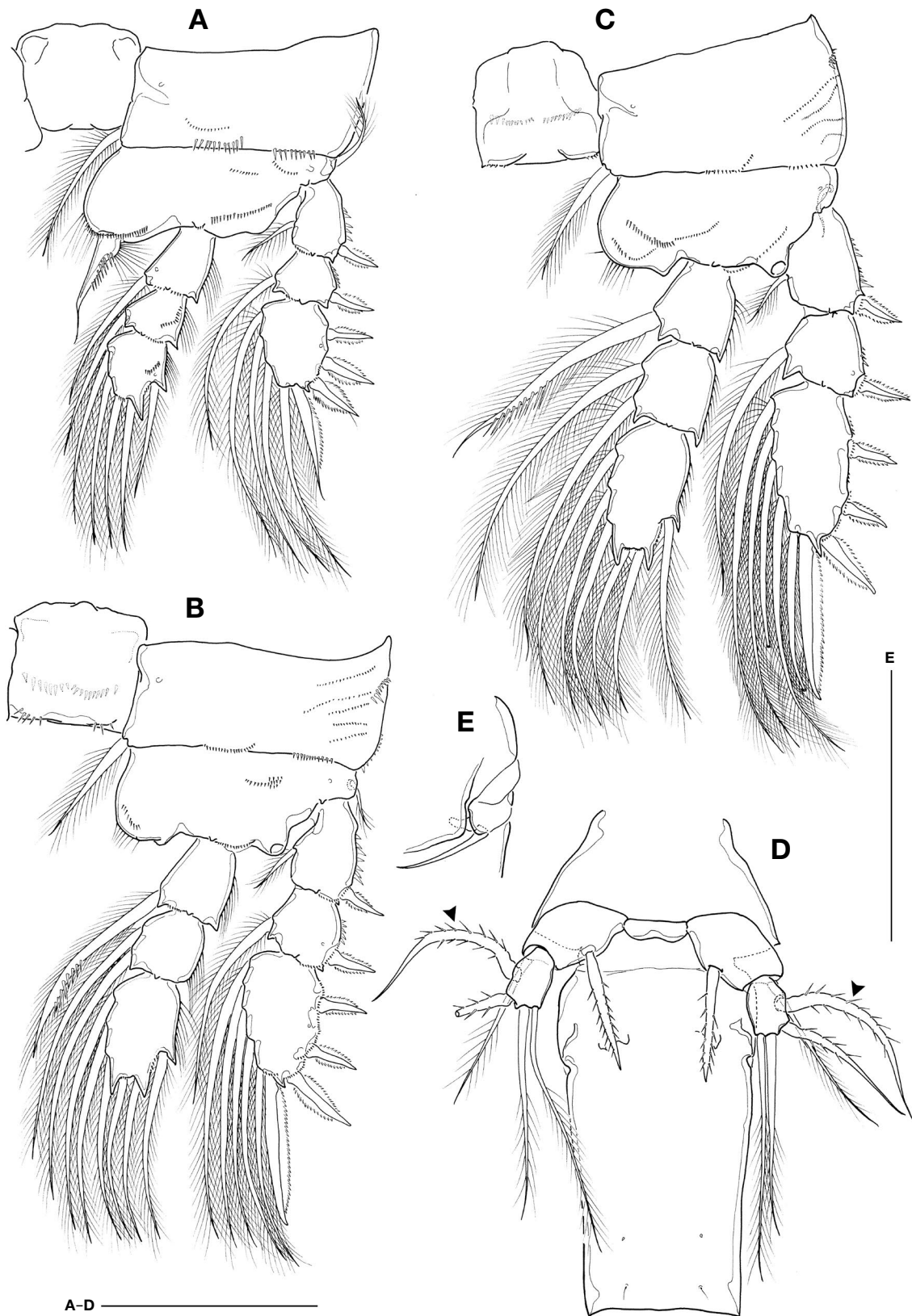
Maxilliped (Fig. 2E) slender, 7-segmented, consisting of syncoxa, basis, and 5-segmented endopod. Syncoxa bearing 2 spinous projections, each representing praecoxal and coxal endites; each endites with 1 pinnate + 1 slender setae and 2 pinnate setae, respectively. Basis forming 1 strong protrusion medially, representing endite, ornamented with 1 spinule row and 7–8 setules on medial surface, armed with 2 setae distally. Endopod with setation of 1, 1, 1, 1, 4 on first to fifth segments, respectively; second endopodal segment with a setule row along swollen medial margin; fourth endopodal segment with 1 long, geniculate seta inner distally; last endopodal segment with 2 geniculate, 1 pinnate, and 1 slender setae.

Legs 1–3 (Fig. 3A–C) and leg 4 (Fig. 1E, F) with 3-segmented exopod and endopod. All intercoxal sclerites of legs 1–3 with almost straight, smooth distal margin; paired lateral lobes weak, with smooth distal margin in leg 1, while with minute spinules on distal margin in legs 2–3; armed with a transverse spinule/setule row on middle of posterior surface in legs 2–3. Endopods of legs 1–4 not eminently shorter than exopod; third exopodal segments distinctly larger than other exopodal/endopodal segments; first endopodal and exopodal segments of legs 1–4 bearing 1 seta inner distally; all exopodal segments with dentical process along outer margin. Leg 1 (Fig. 3A), basis with 1 modified seta on inner distal corner, far reaching beyond distal margin of second endopodal segment; second endopodal segment armed with 1 plumose seta inner distally. Legs 2–3 (Fig. 3B, C), first endopodal segment bearing 1 strong inner seta, with its distal portion highly modified as pinnate. Leg 4 (Fig. 1E), intercoxal sclerite small, narrow, with feeble paired lateral lobes, 4–6 spinules along distal margin and a row of 8–9 spinules on posterior surface; third endopodal segment 2.4 times as long as wide, bearing 2 inner, 2 apical, 1 outer plumose setae; third exopodal segment nearly oblong, armed with 1 outer distal spine, 1 spiniform seta + 1 plumose seta apically, 4 plumose inner setae, and 1 additional plumose seta on outer distal corner of posterior surface, issuing from a socket-structure basally (Fig. 1F). Seta formula (number of setae on last exopodal segments of legs 1–4, including outer distal spiniform seta) 5,6,6,6. Spine formula (number of spines on exopodal segments of legs 1–4) 3,3,3,1. Seta/spine armature of legs 1–4 as follows (Arabic numerals representing setae, while Roman numerals indicating spines):

	Coxa	Basis	Exopod	Endopod
Leg 1	0-1	1-I	I-1; I-1; III,I,4	0-1; 0-1; 1,2,2
Leg 2	0-1	1-0	I-1; I-1; III,I,5	0-1; 0-2; 1,2,3
Leg 3	0-1	1-0	I-1; I-1; III,I,5	0-1; 0-2; 1,2,3
Leg 4	0-1	1-0	I-1; I-1; I + 1,I,5	0-1; 0-2; 1,2,2



**Fig. 2.** *Cyclopinopsis deformata* n. sp., female. A, Antenna; B, Mandible; C, Maxillule; D, Maxilla; E, Maxilliped. Scale bar: A-E= 50  $\mu$ m.



**Fig. 3.** *Cyclopinopsis deformata* n. sp., female. A, Leg 1, anterior; B, Leg 2, anterior; C, Leg 3, anterior; D, Leg 5 and genital somite, ventral; E, Leg 6, dorsal. Scale bars: A-E = 50  $\mu$ m.

Leg 5 (Fig. 3D) located ventrally; comprising completely fused coxobasis and 1-segmented exopod. Intercoxal sclerite small, widened laterally, with slightly swollen outer distal corners and gently concave distal margin, lacking spinules or setules along distal margin. Coxobasis quadrate, apparently defined from fifth pedigerous somite; armed with 1 strong, pinnate seta, situated near middle of inner margin, its tip far exceeding exopod, 2.0 times longer than exopod; outer distal basal seta situated rather dorsally, slender, plumose. Exopod quadrate, 1.42 times as long as wide, armed with 4 setae in total, comprising 2 pinnate outer setae and 2 plumose apical setae; innermost seta longest, slightly not reaching to posterior margin of genital somite; outer proximal pinnate seta characteristically curved anteriorly (Fig. 3D, arrows); medial margin smooth without spinules or setules.

Leg 6 (Fig. 3E) represented by one spinous projection and one long, naked seta at the end of opercular plate, covering gonopore, on dorsolateral surface of genital somite.

**Male.** Not found.

**Etymology.** The specific name is taken from a Latin *deformata* (= deformed), referring to the 'deformed' setiform element which is presumably transformed from an outer spine on the distal corner of the third exopodal segment of leg 4, the outstanding characteristic of the new species.

**Remarks.** Smirnov (1935) established a new genus *Cyclopinopsis* for designating a new species, *C. curticauda* Smirnov, 1935, collected from Kamchatka, the far-eastern Russian sea. Regrettably, as earlier mentioned in the Introduction section, his description as well as the definition of the genus was very insufficiently provided. Furthermore, he presented only three figures of the exopod of female leg 4 and the leg 5 of both sexes for the original description. Smirnov (1935) asserted the deficiency of outer spines on the last exopodal segment of leg 4 as the prominent character of the genus, which exhibited the spine formula of 4,4,4,'2', with 1 outer distal spine and 1 apical spine only, meanwhile, 4,4,4,3 in most other cyclopinid genera, 3,4,4,3 in the genus *Cyclopinodes*, and 4,4,4,4 in the genus *Cyclopina*. Much later, combination of several diagnostic characters was adopted for the genus in the key to genera of the family Cyclopinidae by Huys and Boxshall (1990b) and Boxshall and Halsey (2004): mandibular palp biramous, with 3-segmented exopod; maxilliped with 5-segmented endopod; leg 1 with 3-segmented endopod, bearing one inner seta on the second endopodal segment; leg 5 located ventrally, with intercoxal sclerite, and comprising two defined segments in both sexes. Additionally, we propose the typical setal armature of female leg 5 also deserves another key character for the genus *Cyclopinodes*, that is, a strong, spinous inner seta on the completely fused coxobasis and a pinnate outer seta on a subquadrangular exopod, showing a highly peculiar appearance rather swollen, curved and

protruding outwardly, (cf. Fig. 3D, arrows). The two species already described, *C. curticauda* and *C. brasiliensis* Herbst, 1955, as well as this new species from Korea altogether coincide well with the characters above, and are qualified enough for the membership of the genus.

Based on their description and figures, although both the original descriptions of *C. curticauda* and *C. brasiliensis* are not satisfied with the now-a-day's criteria, the two species showed several discrepancies enough to separate each other, as shown in the Table 1. Nevertheless, the morphological differences between them seem to be not so great than anticipated, when considering their great far-off geographical distribution and the high endemism of meiofaunal invertebrates inhabiting interstitial waters. Herbst (1955) enumerated the discrepancies between the two species: longer caudal ramus (1.44 times as long as wide in *C. brasiliensis* versus slightly longer than wide in *C. curticauda*); mandibular basis completely divided from first endopod in *C. brasiliensis*, while they are fused in *C. curticauda*; relative lengths of setae on the female leg 5 (cf. Table 1 for details); and *C. curticauda* is sexually dimorphic in the armature of leg 5 (a inner seta on coxobasis lacking and five setae on exopod), while not sexually dimorphic in *C. brasiliensis* (male leg 5 bearing an inner seta on coxobasis and four exopodal setae as in female's). *Cyclopinopsis deformata* n. sp. shares with *C. curticauda* the short caudal ramus and the similar setal arrangement of leg 5. However, *C. deformata* n. sp. differs from both the congeners as follows: (1) the outer caudal seta (= caudal seta III, as referred in Huys and Boxshall, 1990a) is situated manifestly dorsal, just beside dorsal caudal seta (cf. Fig. 1B); (2) two exopodal setae of antenna exist, including a vestigial, minute one, while the vestigial seta is not manifested in the congeners; (3) setation on 3-segmented mandibular exopod is 1,1,3, versus 1,1,2 in *C. curticauda* and 1,1,1 in *C. brasiliensis*, respectively; and (4) a deformed seta on a socket-like protrusion exists at the outer distal corner of the third exopodal of leg 4, slightly proximal to the outer distal spine (cf. Fig. 1B). The last character, a deformed seta on leg 4, suggests an intermediate form showing the character transformation from an outer spine into a complete deficiency of it. When the spine formula 4,4,4,'2' is regarded as a highly-weighted generic character for the genus *Cyclopinopsis*, the deformed seta shown in this species should be also treated as a discriminative character differentiating it from its congeners.

Finally, invalidity of this new species might be raised. In other words, *C. deformata* n. sp. might be suspicious to be identical with *C. curticauda*, because the latter's type locality of Kamchatka was very near to the East Sea and Korean peninsula, and some important characteristics written in Smirnov's (1935) description could be erroneously prepared, especially as might be omitted the deformed seta on the third exo-

**Table 1.** Character comparison table for three members of the genus *Cyclopinopsis*

	<i>C. curticauda</i>	<i>C. brasiliensis</i>	<i>C. deformata</i> n. sp.
Body length, ♀ (µm)	660–750	440	429–507
Caudal ramus (length/width), ♀	Slightly longer than wide	1.44	1.1–1.2
Location of outer caudal seta	Normal	Lateral, issuing from same level of dorsal seta	Obviously dorsal, beside dorsal seta
Antenna, number of exopodal setae	1	1	1 + 1 (vestigial)
Mandible, basis and 1st endopodal segment	Fused	Completely separated	Completely separated
Mandible, setation of 3-segmented exopod	1,1,2	1,1,1	1,1,3
Leg 4, number of outer spine on 3rd exopodal segment	1	1	1 + 1 (deformed seta)
Leg 5 (♀), inner seta of coxobasis	Not reaching to end of exopod	Slightly reaching over exopod	Far beyond exopod
Leg 5 (♀), lateral seta of coxobasis	3 times longer than leg 5 exopod	2 times longer than leg 5 exopod	3 times longer than leg 5 exopod
Leg 5 (♀), apical setae on exopod	Innermost seta slightly longer than neighboring one	Innermost seta much shorter than neighboring one	Innermost seta slightly longer than neighboring one
Leg 5 (♂), setal armature	Inner seta on coxobasis lacking; 5 setae on exopod	Inner seta on coxobasis present; 4 setae on exopod	–
Habitats	Epibenthic	Interstitial (1–2 m deep at a gravel beach)	Interstitial (littoral bottom, or low-water line of beach)
Localities [References]	N.W. Pacific (Kamchatka) [Smirnov, 1935]	S. Atlantic (Brazil) [Herbst, 1955]	N.W. Pacific (Yellow Sea, East Sea) [this study]

podal segment of leg 4. In fact, he erroneously described the maxilliped, as “Der Endopodit der Maxillipeden besteht aus 6 Gliedern, sein 1. Glied ist verbreitert, ... Das 1. Endopoditenglied trägt auch 2 Borsten, andere Glieder tragen je eine Borste.” (Smirnov, 1935: 163, lines 14–19). Actually, the first enopodal segment of maxilliped in his statement above was an error of the basis, swollen inward and bearing two setae, and therefore the “6-segmented endopod” should be corrected as 5-segmented. It cannot be deniable that not a few details in his description, especially about mouthparts, might be erroneously or inadequately treated, so were the description and figures of Herbst’s (1955). Therefore, it doesn’t become fully assured whether the discrepancies shown in the Table 1 are resulted from the genuine interspecific differences between this new species and the two congeneric species, or simply derived from the incorrect observations and inadequate depictions often appeared in the earlier works by the old time authors. Nonetheless, it is inconceivable for Smirnov (1935) to neglect the deformed seta presumably modified

from the outer spine on the last exopodal segment of leg 4, who established the genus *Cyclopinopsis* mainly on the basis of the spine formula. The seta, if existed, was too conspicuous and noticeable to be ignored withal in both the two congeneric species. Moreover, the obvious size gap between body lengths of *C. deformata* n. sp. and *C. curticauda* (429–507 µm long in *C. deformata* n. sp. versus 660–750 µm long in *C. curticauda*) is consistently observed, as is the deformed seta of the leg 4 exopod, in both the populations from the East Sea, neighboring to the Kamchatka, and from the other side of the Korean Peninsula, the Yellow Sea coast. The Yellow Sea has a quite different geological history, and exhibits rather high endemism as well as a very different species constitution in comparison with that of the East Sea. So, in spite that validity of the present new species will be fully justified later, pending the detailed reexamination of the two ‘old’ congeners, it appears quite reasonable and convincing to infer that this species from Korea be treated as a distinct and valid one at present.



# A key to species of the genus *Cyclopinopsis* Smirnov

1. A deformed seta present on the outer distal corner of the third exopodal segment of leg 4; antenna with two exopodal setae, including a reduced, minute setular one.....*C. deformata* n. sp.  
– The deformed seta absent from the third exopodal segment of leg 4; antenna with only an exopodal seta ..... 2
2. Female around 700 µm long; caudal ramus slightly longer than wide; innermost apical seta on exopod of female leg 5 slightly longer than the neighboring one; male leg 5 bearing five setae on exopod, without inner seta on coxobasis ..... *C. curticauda*  
– Female less than 500 µm long; caudal ramus about 1.4 times as long as wide; innermost apical seta on exopod of female leg 5 much shorter than the neighboring one; male leg 5 bearing four setae on exopod and an inner seta on coxobasis ..... *C. brasiliensis*

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