

Short communication

A New Record of the Species *Orchomenella pinguis* (Crustacea, Amphipoda, Tryphosidae) from Korean Waters

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ABSTRACT

A newly recorded species *Orchomenella pinguis* (Boeck, 1861) belonging to the family Tryphosidae Lowry and Stoddart, 1997 has been collected from the east sea of Korea. The species is similar to *O. minuta* (Krøyer, 1846) and *O. pinguides* Walker, 1903 but, distinguishable with the following characteristics: gnathopod 1, propodus slightly narrowing distally; gnathopod 1, carpus with narrowly developed posterior lobe; gnathopod 2, carpus conspicuously swollen posteriorly; coxae 5–6, posterodistal lobes strongly produced; epimera 2–3, irregularly serrated posteriorly. The species is described and fully illustrated in this study. A key to the Korean species of *Orchomenella* is also provided.

Keywords: Amphipoda, Lysianassoidea, Tryphosidae, *Orchomenella*, Korea

INTRODUCTION

The superfamily Lysianassoidea Dana, 1849 is well-known as dominant amphipods in Antarctic waters and comprise numerous species (De Broyer et al., 2001; Havermans et al., 2010). The family Tryphosidae Lowry & Stoddart, 1997 is very large group comprising 42 genera including the genus *Orchomenella* Sars, 1890 (Horton et al., 2020). The genus *Orchomenella* belongs to one of eight genera so-called *Orchomene* complex (De Broyer, 1984, 1985). These genera have similar morphological characteristics and their relationship through molecular study as sequence makers 28S, COI indicates (Havermans et al., 2010, 2011, 2018; D'Acóz and Havermans, 2012) is continuously analyzed. The genus *Orchomenella* is morphologically very close to *Orchomene* Boeck, 1871, but these two genera were defined based on the shape of their molar and outer plate of maxilliped (Oleröd, 1975; De Broyer, 1984, 1985; Barnard and Karaman, 1991). *Orchomenella* mostly carries subcylindrical (button-shaped) molar and outer plate of maxilliped bearing two strong apical spines, but *Orchomene* chiefly appear to slightly elongate, narrow, and forms a setose ridge in molar and outer plate of maxilliped lacking apical spine. To date, 34 described species

are known in the genus *Orchomenella* (Horton et al., 2020), of which five *Orchomenella* species have been reported from Korea: *O. obtusa* (G. O. Sars, 1891); *O. japonica* Gurjanova, 1962; *O. paucisetigera* Jung, Yi, Coleman & Yoon, 2017; *O. rugosa* Jung, Yi, Coleman & Yoon, 2017; *O. littoralis* Nagata, 1965. In this paper, we add another species, *Orchomenella pinguis* (Boeck, 1861) to the Korean lysianassoid amphipods fauna. The terminology of the setae of the mandibular palp follows Lowry and Stoddart (1993). The specimens were collected with a fishing net from the subtidal zone at Ayajin port, Gangwon-do, in the eastern waters of Korea. They have been deposited at the Marine Amphipoda Resources Bank of Korea (MARBK), Cheonan, Korea.

SYSTEMATIC ACCOUNTS

Order Amphipoda Latreille, 1816
Superfamily Lysianassoidea Dana, 1849
Family Tryphosidae Lowry & Stoddart, 1997
Genus *Orchomenella* Sars, 1890

****Orchomenella pinguis* (Boeck, 1861) (Figs. 1–3)**

Korean name: ¹*불록손긴팔옆새우 (신칭)

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Orchomene pinguis Boeck, 1876: 176, Pl. 5, fig. 1; Barnard, 1964: 90, fig. 21.

Orchomenella pinguis G.O. Sars, 1895: 282, Pl. 24, fig. 2; Gurjanova, 1951: 283, fig. 150; 1962: 166, figs. 48–49.

Material examined. 1 ♀ (MARBK-265), Korea: Gangwon-do, Goseong-gun, Toseong-myeon, Ayajin port, 38° 16'23"N, 128°33'24"E, 30 Mar 2018, Heo JH. The remaining specimens 2 ♀♀ (MARBK-266), in the collection of the corresponding author.

Description. Female, body 8.40 mm long (Figs. 1, 2A), dorsally smooth; head, lateral cephalic lobe subacute; eye invisible, pigment disappear in alcohol. Epimeron 1 rounded and convex ventrally, epimera 2–3 weakly and irregularly serrated posteroventrally. Urosomite 1 with developed dorsal keel, extending backward above following urosomite dorsodistally.

Antenna 1 (Fig. 2B) short and stout; peduncular article 1 swollen with a row of penicillate setae on ventrodorsal margin; peduncular articles 2–3 telescoping, short; length ratio of peduncular articles 1–3 = 1.00 : 0.29 : 0.26; flagellum 10-articulate, 1.29 times as long as peduncle; article 1 with strong callynophore, calceoli absent; accessory flagellum 4-articulate, article 1 rather elongated.

Antenna 2 (Fig. 2C) slender, elongated, about 1.30 times as long as antenna 1; peduncular article 4 slightly widening distally, 1.60 times as long as article 5, with a row of simple setae, 5 penicillate and unequal simple setae ventrally; flagellum elongated, 18-articulate, calceoli absent.

Left mandible (Fig. 2D), incisor smooth, with 1 small tooth on cutting edge; lacinia mobilis slender, narrowly cylindrical, present on left side only; accessory setal row with 3 setaceous spines and setules; molar process well developed, subcylindrical, truncate and triturate distally; palp attached slightly below molar level, 3-articulate; article 1 short, unarmed; article 2 longest, slightly widening anterodistal margin, with 13 B2-setae; article 3 falcate, 0.72 times as long as article 2, with 12 D3-setae and 3 E3-setae.

Maxilliped (Fig. 2E), inner plate (Fig. 2F) subrectangular, slightly exceeding article 1 of palp, with row of 6 pectinate setae medially, apical margin with 3 blunt spines and 2 simple setae; outer plate subovate, exceeding distal end of article 2 of palp, with 9 medial and 2 apical blunt spines, lateral surface covered with setules; palp 4-articulate, article 1 broad proximally, 0.79 times as long as article 2, with 1 simple seta on medial and laterodistal margins, respectively; article 2 with a row of 26 simple setae on inner margin, 2 simple setae laterodistally; article 3 subrectangular, with unequal simple setae on medial margin and posterodistal corner; article 4 falcate, with small unguis, shorter than article 3.

Gnathopod 1 (Fig. 2G) subchelate; coxa large, anterior



Fig. 1. *Orchomenella pinguis* (Boeck, 1861), female, 8.40 mm, habitus. Scale bar = 1.0 mm.

margin concave, expanded anteriorly; basis subrectangular, with unequal simple setae on both margins; merus with pubescence posteriorly and simple setae posterodistally; carpus subequal to ischium, subtriangular, produced posterodistally, with ventral setules; propodus rectangular, slightly narrowing distally, 1.92 times as long as carpus, palm short, slightly convex, defined by 1 stout spine posterodistally; dactylus falcate, fitting palm.

Gnathopod 2 (Fig. 2H) slender; coxa subrectangular, width 0.42 times length; basis slender, elongated, with unequal simple setae on both margins; ischium elongated, with unequal simple setae anteriorly, 0.91 times as long as carpus; merus 0.52 times as long as ischium, with setules posteriorly; carpus 0.47 times as long as basis, posterior margin conspicuously swollen, with patch of spinules, lateral margin covered with setules, a cluster of unequal simple setae anterodistally; propodus short, 0.62 times as long as carpus, obtusely angled distally with unequal unipinnate setae, generally covered with setules; dactylus small, fitting palm.

Pereopod 3 (Fig. 2I), coxa (Fig. 2J) similar to that of gnathopod 2; basis with unequal simple setae on both margins; merus 2.47 times as long as ischium, produced anterodistally, with 2 simple setae, posterior margin with unequal simple setae; carpus subrectangular, 0.76 times as long as merus, with unequal simple setae posteriorly; propodus rectangular, 1.39 times as long as carpus, with spines and simple setae posteriorly; dactylus falcate, 0.23 times as long as propodus, with 1 penicillate seta posteriorly.

Pereopod 4 (Fig. 3A) similar to pereopod 3 except coxa (Fig. 3B) much broader than that of pereopod 3, posterior margin excavated, posterodistal lobe strongly produced.

Pereopod 5 (Fig. 3C), coxa large, rounded subquadrate,

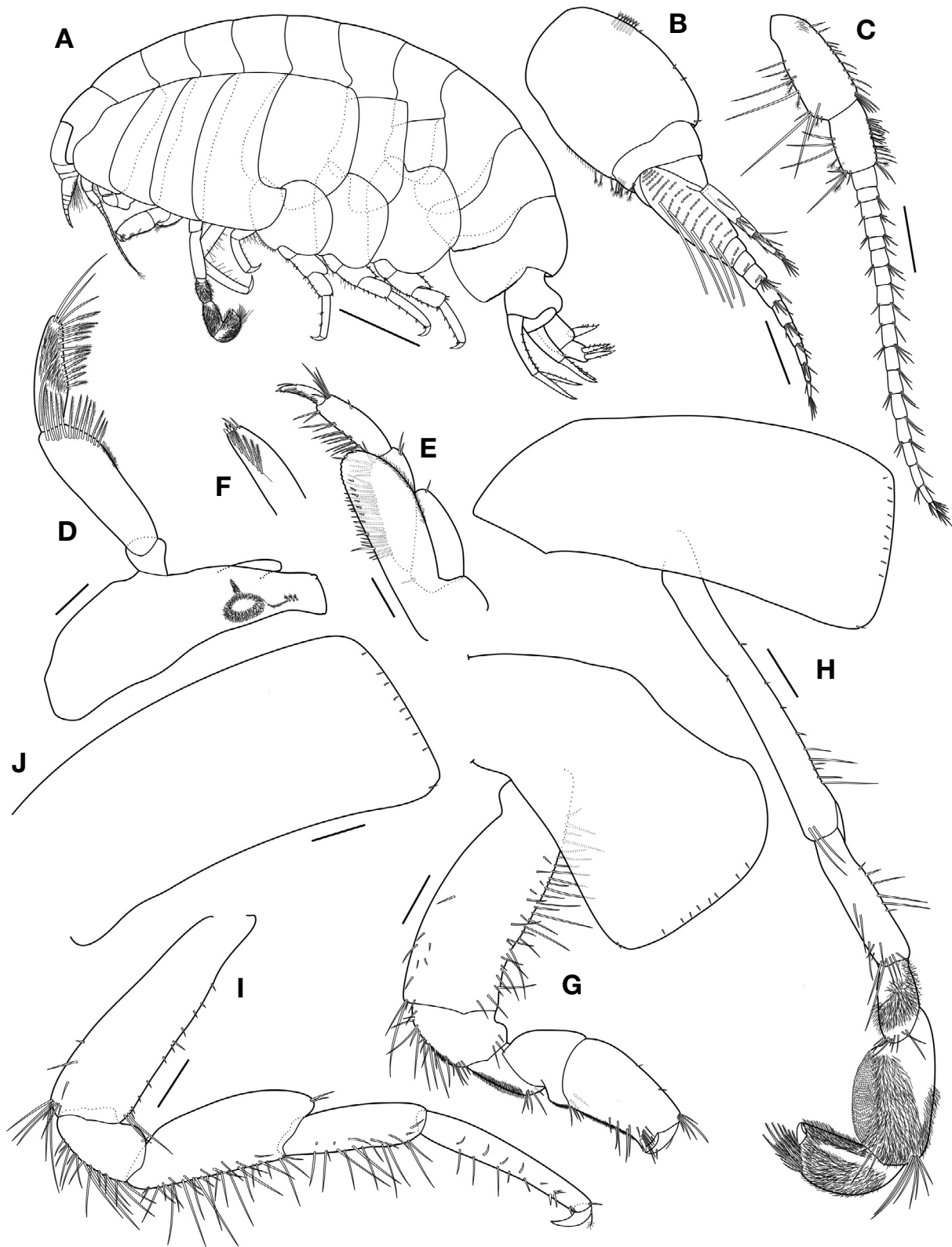


Fig. 2. *Orchomenella pinguis* (Boeck, 1861), female, 8.40 mm. A, Habitus; B, Antenna 1; C, Antenna 2; D, Left mandible; E, Maxilliped; F, Maxilliped (inner plate); G, Gnathopod 1; H, Gnathopod 2; I, Pereopod 3; J, Coxa 3. Scale bars: A=1.0 mm, B, C, G-J=0.2 mm, D-F=0.1 mm.

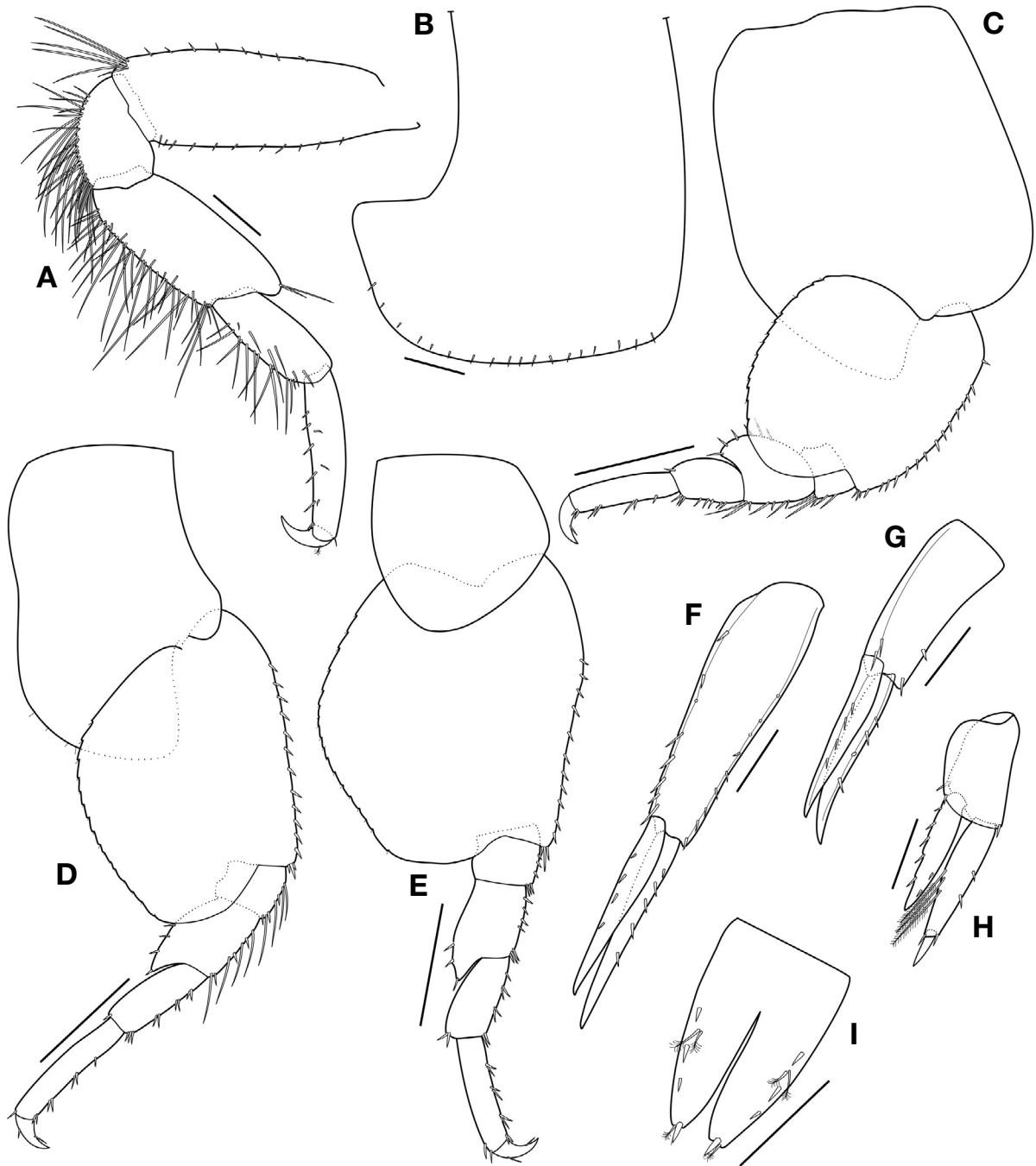


Fig. 3. *Orchomenella pinguis* (Boeck, 1861), female, 8.40 mm. A, Pereopod 4; B, Coxa 4; C, Pereopod 5; D, Pereopod 6; E, Pereopod 7; F, Uropod 1; G, Uropod 2; H, Uropod 3; I, Telson. Scale bars: A, B, F–I=0.2 mm, C–E=0.5 mm.

posterodistal lobe strongly produced, width 0.79 times length; basis subovate, posteroventral lobe rounded and expanded, width 0.95 times length, with a row of spines along anterior margin, weakly serrated posterior margin; merus expanded posteriorly, with 6 simple setae, anterior margin with 4 simple setae and 3 spines; carpus subquadrate, slightly expanded

posteriorly, 0.76 times as long as merus, with 8 robust spines anteriorly and 1 robust spine posterodistally; propodus rectangular, 1.46 times as long as carpus, with 4 robust spines and 2 simple setae anteriorly; dactylus falcate, 0.53 times as long as propodus.

Pereopod 6 (Fig. 3D), coxa large, bilobate, anterodistal lobe

small, posterodistal lobe strongly produced, both margins concave, width 0.64 times length; basis subquadrate, posteroventral lobe rounded and expanded, width 0.78 times length, with a row of spines along anterior margin, posterior margin slightly convex, weakly serrate; merus, carpus, propodus, dactylus similar to those of pereopod 5, but each article longer in proportion than those of pereopod 5.

Pereopod 7 (Fig. 3E) similar to pereopod 6, except coxa small and subquadrate; basis broader than that of pereopod 6, posterior margin convex.

Uropod 1 (Fig. 3F), peduncle subrectangular, 1.37 times as long as outer ramus, with 8 dorsomedial and 9 dorsolateral robust spines; outer ramus slightly longer than inner one, with 5 lateral spines; inner ramus with 4 medial spines.

Uropod 2 (Fig. 3G), peduncle subequal to outer ramus, with 2 spines each dorsolateral margin; outer ramus slightly longer than inner one, with 4 robust spines laterally; inner ramus with 4 medial spines.

Uropod 3 (Fig. 3H), peduncle short, 0.72 times as long as outer ramus, with 2 spines dorsodistally and 1 spine ventrodistally; outer ramus biarticulate, 1.26 times as long as inner ramus, proximal article with 3 plumose setae on inner margin, outer margin with 2 spines, distal portion with 2 single spines; distal article slender, 0.30 times as long as proximal one; inner ramus not reaching end of proximal article of outer ramus, inner margin with 2 spines, outer margin with 5 robust spines.

Telson (Fig. 3I) much longer than broad, cleft about 67% of its length, each lobe with apical notch bearing 1 stout spine and 1 penicillate seta, 3 robust spines and a pair of penicillate setae dorsolaterally.

Remarks. *Orchomenella pinguis* (Boeck, 1861) is very similar to *O. minuta* (Krøyer, 1846) and *O. pinguides* Walker, 1903 in general appearance, but is easily distinguishable by the serrated posterior margins of epimera 2–3, the narrowly developed posterior lobe of carpus, slightly narrowing distally propodus of gnathopod 1 and conspicuously swollen posteriorly carpus of gnathopod 2. Our specimens are in accordance with those previous descriptions (Boeck, 1861; Sars, 1890; Gurjanova, 1951, 1962). To date, five *Orchomenella* species (*O. obtusa*, *O. japonica*, *O. paucisetigera*, *O. rugosa*, *O. littoralis*) have been recorded in Korean waters (Kim, 1991; Jung and Kim, 2008; Jung et al., 2017; Heo and Kim, 2019). Among them, *O. rugosa* and *O. littoralis* are characterized with the serration on the posterior margin of epimeron 3. However, they are easily distinguished from *O. pinguis* by the round and narrow expansion of coxa 4 posteriorly and the weak posteroventral lobe of coxa 6.

Distribution. Arctic, Atlantic, Pacific Ocean, European coasts, Norway, Japan, Korea (East Sea).

Depth range. 450–600 m.

Key to the species of *Orchomenella* in Korean waters (modified from Heo & Kim, 2019)

1. Lateral cephalic lobe rounded 2
 - Lateral cephalic lobe pointed or subpointed 3
2. Gnathopod 1, propodus not exceed half the length of the basis, margins parallel; palmar margin irregular
 - *O. paucisetigera* Jung, Yi, Coleman & Yoon, 2017
 - Gnathopod 1, propodus exceed half the length of the basis, ventral margin slightly concave; palmar margin convex *O. obtusa* (G. O. Sars, 1891)
3. Urosomite 1 with rounded keel hanging over urosomite 2 dorsodistally 4
 - Urosomite 1 without keel hanging over urosomite 2 dorsodistally 5
4. Epimeral plates 2–3, posterior margins not serrated; coxa 5, posteroventral lobe moderately developed
 - *O. japonica* Gurjanova, 1962
 - Epimeral plates 2–3, posterior margins serrated; coxa 5, posteroventral lobe strongly developed
 - *O. pinguis* (Boeck, 1861)
5. Epimeral plate 3, posterior margin weakly serrated; epimeral plates 1–2, posterior margins and urosomite 1 serrated *O. rugosa* Jung, Yi, Coleman & Yoon, 2017
 - Epimeral plate 3, posterior margin serrated; epimeral plates 1–2, posterior margins and urosomite 1 smooth
 - *O. littoralis* Nagata, 1965

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CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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