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A new species of *Alteutha* Baird, 1846 (Copepoda: Harpacaticoida: Peltidiidae) from Korean waters, and a short note of *Eupelte dokdoensis* Song & Lee, 2024

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A new peltidiid species belonging to the genus *Alteutha* Baird, 1846 is described based on the material from Songjihobrackish lake on eastern coast of Korea. The new species, *Alteutha wanae* **sp. nov.** is closely related to *A. potter* Veit-Köhler & Fuentes, 2007, a species originally described from King George Island, Antarctica, in sharing the setation of P5 rami of both sexes, the shape of maxillipedal basis, setal formulae of swimming legs, P2−P4, and the setation of caudal ramus. *Alteutha wanae* **sp. nov.**, however, can be differentiated from *A. potter* by the characters, the number of antennular segment, anterior seta of antennal basis, the length to width ratios of P5 baseoendopod and exopod of both sexes, and male P6. Among benthic harpacticoid copepods collected by benthic surveys in the brackish lakes along the eastern coast of Korea in 1994, a new representative of the genus *Alteutha* was described and illustrated. In addition, we provide the registration information of Zoobank of *Eupelte dokdoensis* Song & Lee, 2024, recently collected from the algal bed bottom in Dokdo Island, Korea.

Keywords: *Alteutha*, brackish lake, Dokdo Island, East Sea, Harpacticoida, Korea

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Introduction

Most members of the family Peltidiidae Claus, 1860 are typically marine algal dwellers, with dorsoventrally flattened bodies adapted to strong water flow over flat algal surfaces (Hicks, 1982; Boxshall and Halsey, 2004). As far, eight peltidiid species were reported from Koren waters: three species belonging to Clytemnestrinae Scott A., 1909 (*Clytemnestra scutellata* Dana, 1849, *Goniopsyllus rostratus* Brady, 1883, *Goniopsyllus dokdoensis* Cho, Kim & Lee, 2010) as planktonic species (Shim and Ro, 1982; Cho *et al*., 2010; Song *et al*., 2017) and five species in Peltidiinae Claus, 1860: *Alteutha depressa* (Baird, 1837), *Alteuthoides affinis* Kim & Kim, 1998, *Eupelte dokdoensis* Song & Lee, 2024, *Peltidium quinquesetosum* Song & Yun, 1999, and *Peltidium byungwooi* Song, Dahms, Kangtia, Chullasorn, Ryu & Khim, 2015 mainly collected from algal beds (Song and Chang, 1995; Song and Yun, 1999; Song *et al*., 2015; Song and Lee, 2024), except for *A. affinis* obtained from a sponge, *Callyspongia elegans* (Thiele, 1899) by Kim and Kim (1998).

To date, 24 species are currently recognized in the genus *Alteutha* Baird, 1846 (Walter and Boxshall, 2025). The new species, named *Alteutha wanae* **sp. nov.**, is described and figured in detail. The new species was recorded from Lake Songjiho (brackish lake), Yeongdeok of eastern coast of Korea (algal beds), and Dokdo Island (using light trap near algal beds).

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Materials and Methods

The materials were obtained from the brackish lake, Songjiho (depth 1−3 m) at Gangwondo province, Korea using plankton net. All samples were fixed in 95% ethanol, immediately after collection. Harpacticoid copepods were sorted under a stereomicroscope (Olympus Model SZ11, Tokyo, Japan) at 40× to 200× magnification. Specimens were dissected, drawn and measured in glycerol. Dissected parts were mounted on slides in glycerin as mounting medium. All mounted slides were sealed with transparent nail varnish. Figures were made with the aid of a drawing tube attached to a DIC microscope (Olympus model BX-53, Japan) equipped with Nomarski optics.

The descriptive terminology for the appendages follows Huys & Boxshall (1991) and Huys *et al*. (1996). All abbreviations used in the text, figures and table are as follows: Caudal ramus (CR); antennule (A1); antenna (A2); aesthetasc (ae); exopod (exp); endopod (enp); first exopodal segment (exp-1) and first endopodal segment (enp-1); first to sixth thoracic legs (P1−P6); pinnate and bare seta (pin, bare). Acrothek is composed of 2 setae fused to an asthetasc on the distal segment of A1. Scale bars are in micrometers (μm). Measurements were made with a micrometer (slide glass type). All types of materials were deposited in the Nakdonggang National Institute of Biological Resources (NNIBR), Korea.

Systematics

Order Harpacticoida G. O. Sars, 1903
Family Peltidiidae Claus, 1860
Genus *Alteutha* Baird, 1846

***Alteutha wanae* sp. nov. (Figs. 1−5)**
부인고갑옷장수노벌레
urn:lsid:zoobank.org:act:71C19903-F874-4BD1-BEE0-F4C607F0AE79

Type locality. Lake Songjiho, Jukwang-myeon, Goseong-gun, Gangwon-do, July 10, 1994.
Material examined. Holotype: adult female (NNIBR: NNIBRIV136397) dissected on 12 slides; adult male allotype (NNIBR: NNIBRIV136396) dissected on 12 slides, 1 female and 1 male paratype (NNIBR: NNIBRIV136394−5) preserved in 70% ethanol.
Etymology. The specific name of *Alteutha wanae* **sp. nov.** is dedicated to first author's wife Kyung Wan Kang.
Additional materials. 3우우, Daejin, Yeongdeok-gun,

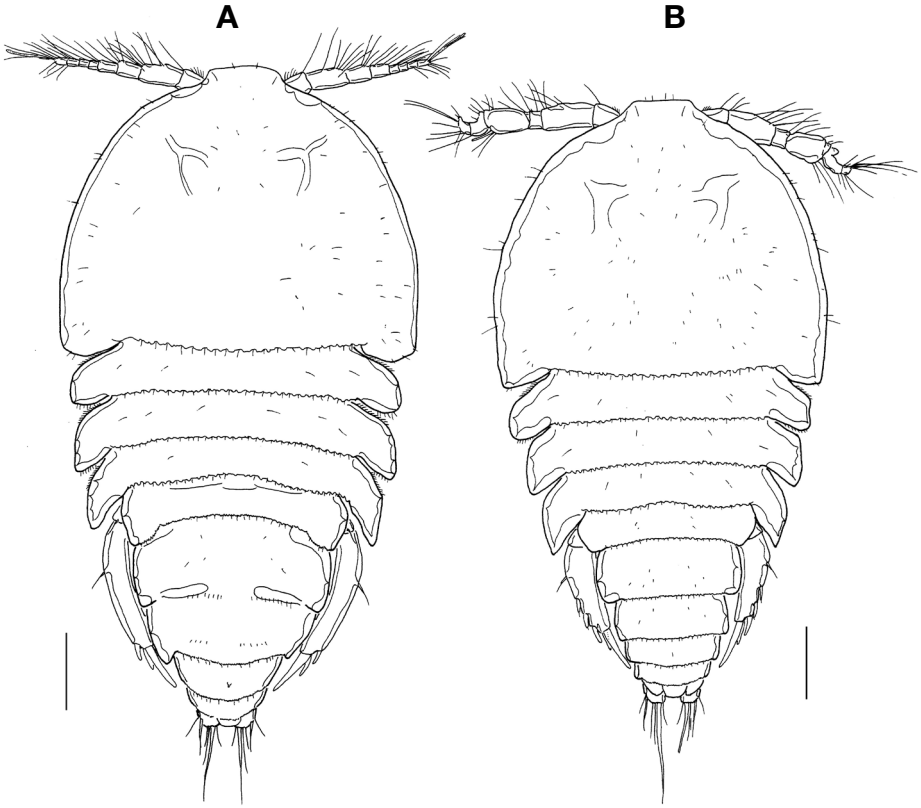

Fig. 1. *Alteutha wanae* **sp. nov.**, (A) female habitus, dorsal; (B) male habitus, dorsal. Scales: 100 mm.

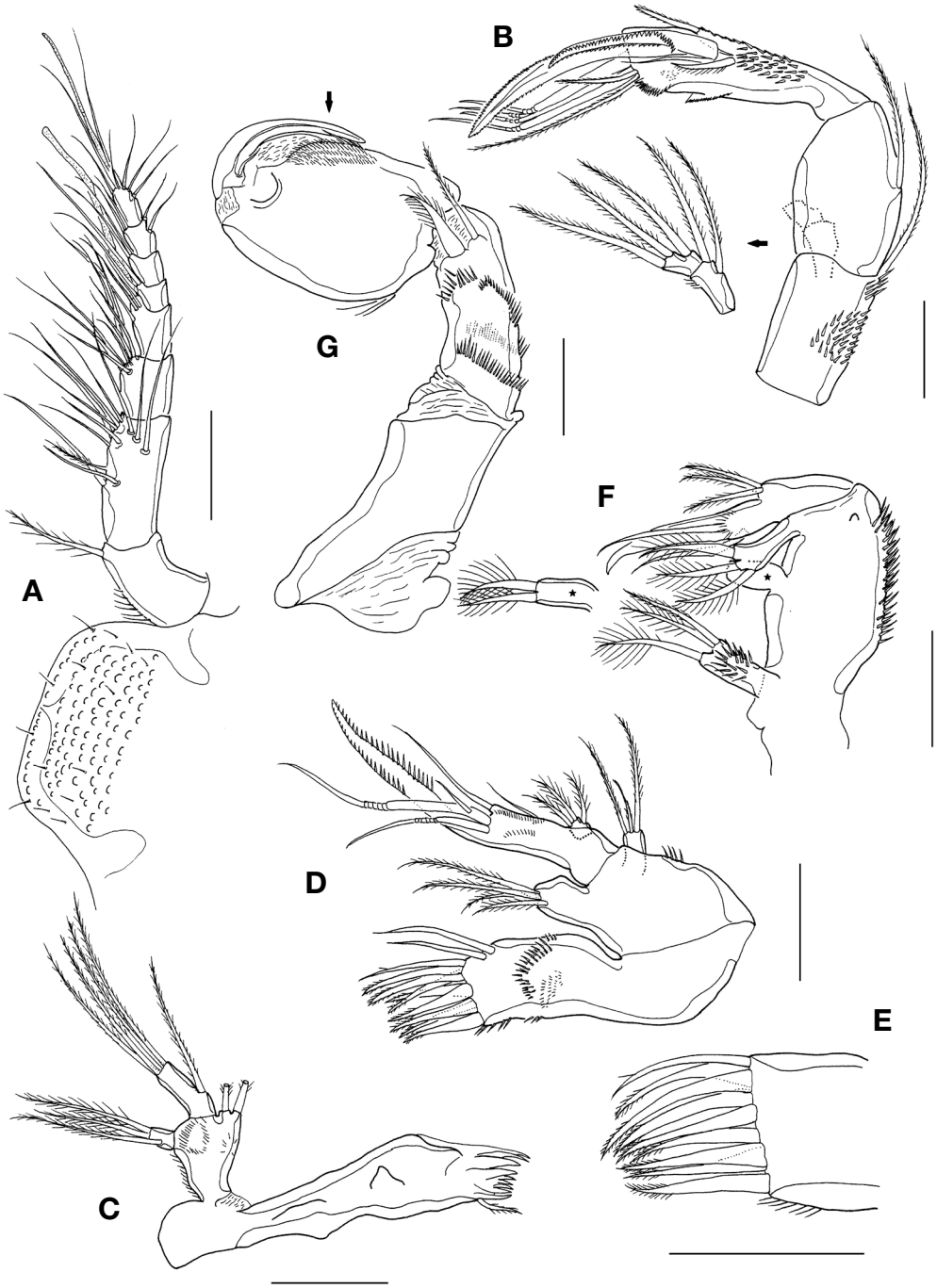

Fig. 2. *Alteutha wanae* **sp. nov.**, female: (A) rostrum and antennule; (B) antenna; (C) mandible; (D) maxillule, right; (E) arthrite of praecoxa, left maxillule; (F) maxilla; (G) maxilliped. Scales: A = 50 mm, others = 30 mm.

Gyeongsangbuk-do, July 24, 1992; 1♀ (dissected), Geumjin-ri, Yeongdeok-gun, Gyeongsangbuk-do, Sep. 25, 1998. 3♀♀, 2♂♂, Dongdo, Dokdo Island, Ulleung-gun, Gyeongsangbuk-do, using light trap, July 14, 2021.

Description of female. Habitus (Fig. 1A). Body length ranging from 0.86–0.92 mm (n = 5), measured from tip of rostrum to posterior margin of caudal ramus. Cephalothorax with scattered many sensilla on its surface as figured. Widest at posterior margin of cephalothorax. All somites of prosome ornamented with sensilla on surface and serrated distal margin.

Urosome (Fig. 1A) tapering posteriorly, 5-segmented, consisting of P5-bearing somite, genital double-somite, 2 free urosomites, and anal somite. Genital double-somite

(Figs. 1A, 5B) wider than long, with transverse surface ridges dorsally and laterally, and ornamented with several sensilla on surface. P6 (Fig. 5B) represented by 2 bare setae on single plate over gonopores.

Caudal ramus (Fig. 5A) about 1.2 times as long as wide. Each ramus with 7 setae: seta I bare, arising from subdistal lateral surface; seta II strong and bipinnate, with normal base, inserted next to seta I; seta III slender and bare; seta IV and seta V well-developed, former bipinnate and latter multipennate; seta VI bare and shortest; seta VII bare, as long as seta VI, arising from subdistal dorsal surface between setae V and VI.

Rostrum (Fig. 2A) wide and rounded rectangular, covered with numerous dents, with several setules on surface.

Antennule (Fig. 2A) 8-segmented; segment 1 ornamented with setules on anterior margin, with apinnate seta distally; segment 2 longest; segment 4 with aesthetasc fused to a seta, arising from pedestal; segment 5 shortest; distal 3 segments subequal in length. Setal formula as follows: 1-[1 pin], 2-[1 pin + 11 bare], 3-[8], 4-[3 + (1 + ae)], 5-[2], 6-[2], 7-[4], 8-[2], 9-[5 + acrothek].

Antenna (Fig. 2B) consisting of basis, two-segmented exopod and endopod. Basis longer than wide, ornamented with numerous small spinules anteriorly, with one bipinnate seta. Exopod two-segmented; first segment longer than second one, with several setules on outer margin and two bipinnate setae; second segment with 2 distal and 1 lateral bipinnate setae. Endopod 2-segmented; first segment with one bipinnate abexopodal seta on middle; second segment with many small spinules anterior surface and several spinuls on posterior surface distally, with hyaline frills on middle and subdistally. Subdistal armature consisting of 1 bare and 2 pinnate setae, and 1 serrate spine; distal armature consisting of 2 pinnate, 4 geniculate setae, and 1 serrate spine.

Mandible (Fig. 2C) gnathobase long well-developed with 9 distal cuspidate teeth and 1 bipinnate seta on dorsal corner as depicted. Palp consisting of basis, 1-segmented exopod, and 1-segmented endopod. Basis armed with many setules on surface, and with 2 setae. Exopod smaller than endopod, with 1 lateral and 2 distal bipinnate setae. Endopod with 1 lateral and 4 distal bipinnate setae.

Maxillule (Fig. 2D, E) arthrite of praecoxa well-developed, with 9 distal spines/setae (all pinnate distally) and

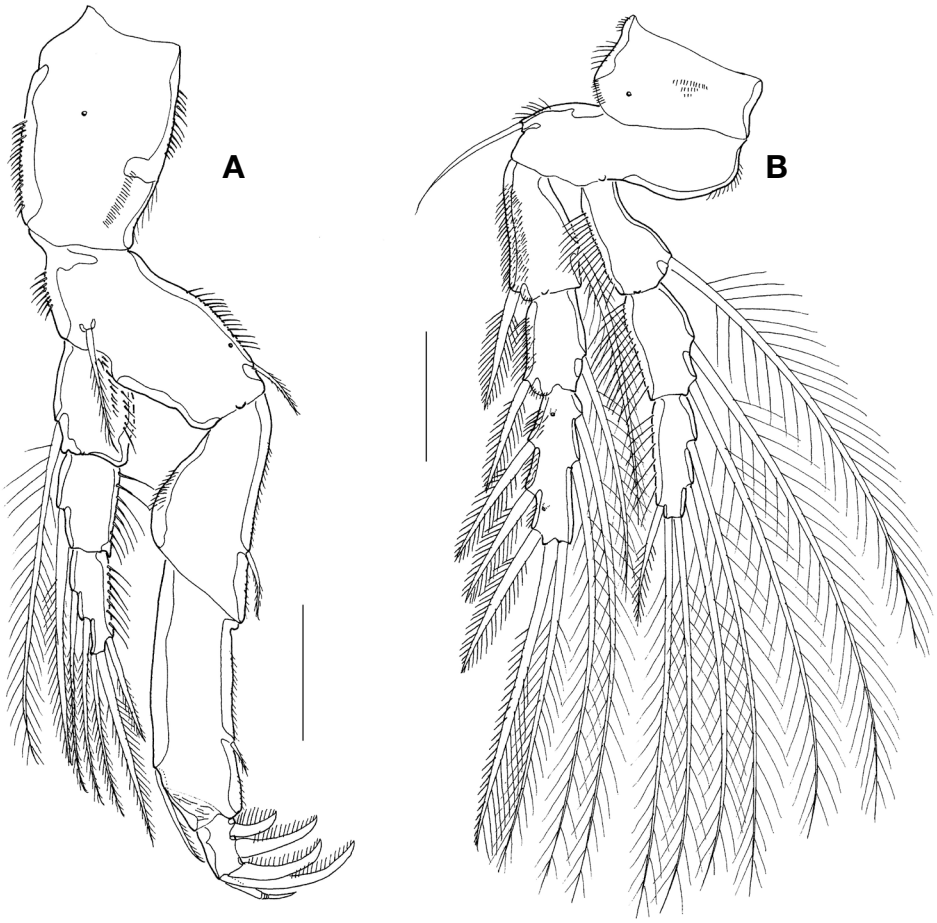

Fig. 3. *Alteutha wanae* **sp. nov.**, female: (A) P1; (B) P2. Scales: A = 30 mm; B = 50 mm.

2 setae on surface. Coxa with several setules on outer margin. Coxal endite with 4 bipinnate setae; epipodite with 3 bipinnate setae. Basis elongate with 2 setular rows on surface, and with 6 elements (2 geniculate, 3 bare, and 1 strong bipinnate seta). Exopod one-segmented with 3 short bipinnate setae.

Maxilla (Fig. 2F) syncoxa with many setules along outer surface, and with 3 endites fused to syncoxa; proximal endite somewhat apart from others, covered with setules on surface and 1 bipinnate and 2 plumose setae distally; middle endite with 2 plumose setae, and distal endite with 3 plumose setae. Basis drawn into strong claw with 2 accessory setae; Endopod represented by small protrusion bearing 3 pinnate setae.

Table 1. Setal formula of swimming legs of *Alteutha wanae* **sp. nov.**

Thoracopod	Exopod	Endopod
P2	1 1 223	1 2 221
P3	1 1 323	1 2 321
P4	1 1 323	1 2 221

Maxilliped (Fig. 2G) subchelate, well-developed, prehensile. Praecoxa elongated and unarmed. Syncoxa armed with setular rows as depicted, and with 2 bipinnate subdistal setae. Basis with several setular rows and 1 small seta on palmar surface (arrow). Endopod shorter than basis and drawn out into strong, curved claw, accessory armature consisting of 1 bare seta.

P1 (Fig. 3A). Coxa longitudinally elongate, ornamented with spinular rows along both margins and on distal surface, and with a pore as figured. Basis transversally elongate, with setules on inner and outer margins and with a pore on subdistal outer surface; with inner and outer bipinnate seta. Exopod 3-segmented, much longer than endopod; exp-1 widened distally, with inner and outer spinules, and 1 outer bipinnate seta; exp-2 longer than exp-1, with setules along outer margin, 1 small outer bipinnate seta, and 1 pinnate inner seta; exp-3 small, with 1 geniculated seta and 4 strong, outwardly curved pinnate claws. Endopod 3-segmented and gradually narrowed; ornamented with setules on outer anterior surface, with 1 plumose

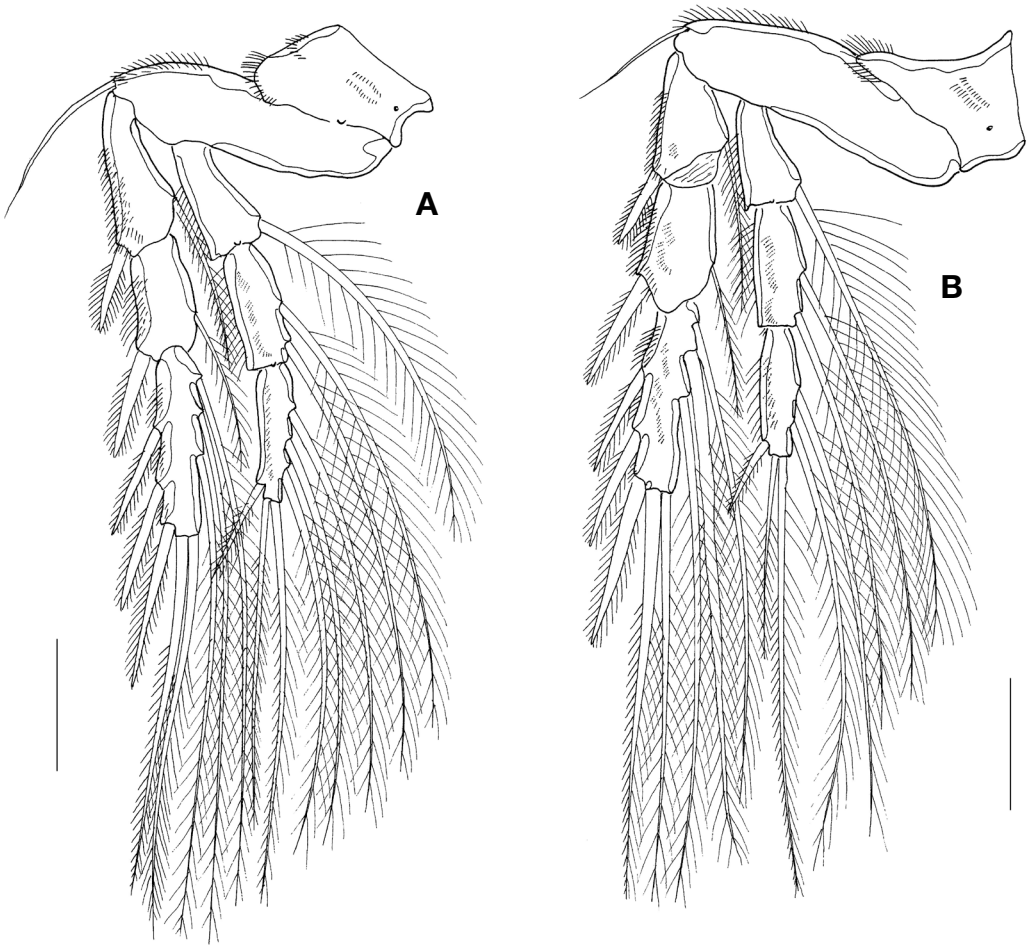

Fig. 4. *Alteutha wanae* **sp. nov.**, female: (A) P3; (B) P4. Scales: 50 mm.

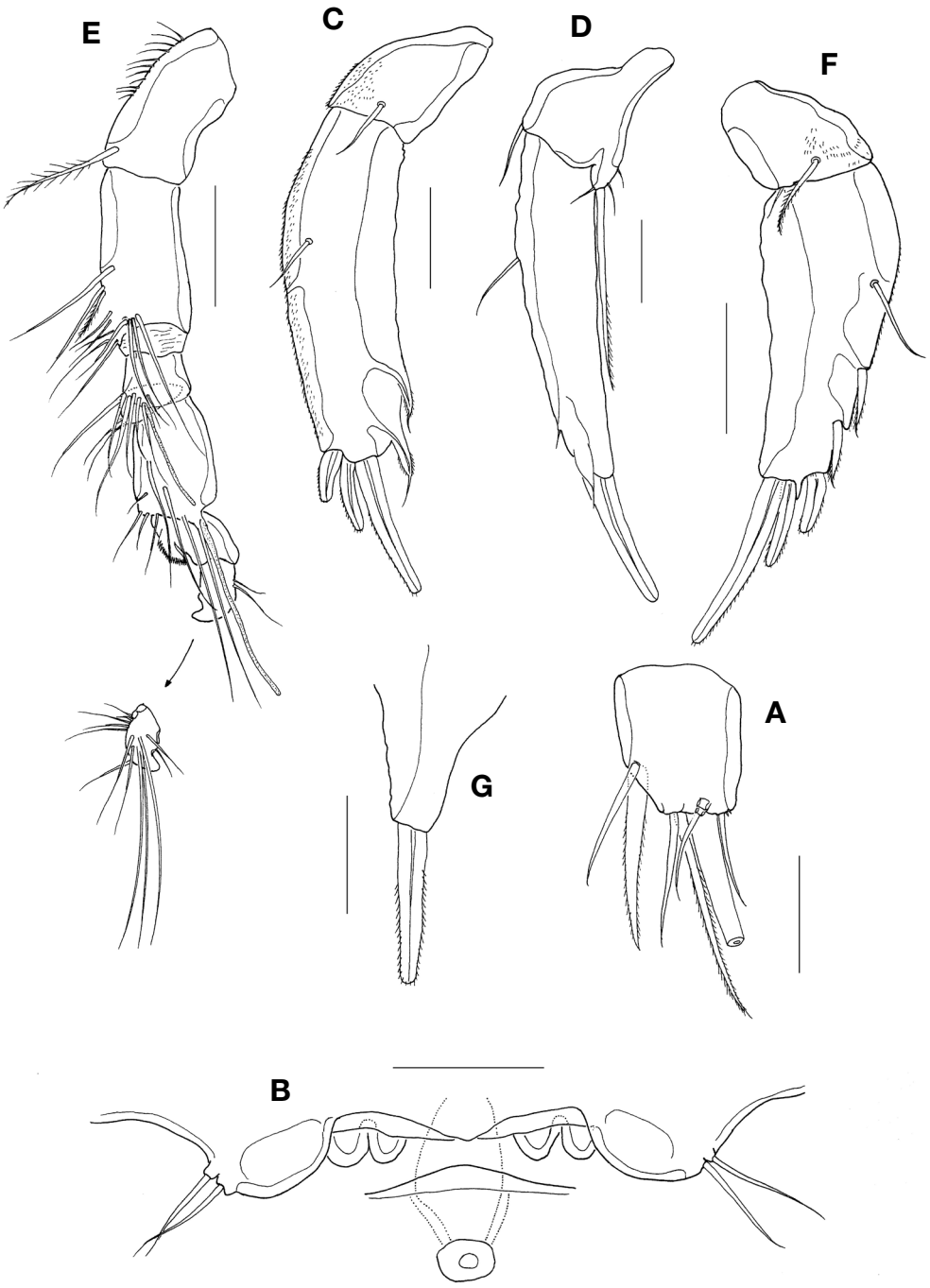

Fig. 5. *Alteutha wanae* **sp. nov.**, female: (A) caudal ramus; (B) genital field; (C) P5, anterior; (D) P5, posterior. male. (E) antennule; (F) P5; (G) P6. Scales: A, B, F = 30 mm, others = 50 mm.

inner seta; enp-2 with long setules on outer margin and with 1 bipinnate inner seta; enp-3 with long setules on outer margin, 1 outer, 2 distal, and 2 inner setae, all of which bipinnate.

P2 (Fig. 3B, Table 1). Coxa wider than long, ornamented with long and short setules on outer margin and on anterior surface. Basis much wider than long, with several setules on outerodistal and on half proximal inner margin, and with 1 bare outer seta. Exopod with 3 segments, a little longer than endopod; exp-1 with setules on outer margin and anterior surface, with 1 bipinnate outer spine and 1 plumose inner seta; exp-2 with outer setules as in exp-1, with 1 bipinnate outer spine and 1 plumose inner seta; exp-3 with spinules and two pores as figured, 3 bipinnate

outer spines, 2 terminal setae, and 2 plumose inner setae. Endopod with 3 subequal segments; enp-1 with outer long setules and 1 plumose inner seta; enp-2 with outer long setules and with 2 plumose inner setae; enp-3 with outer setules, and with 1 outer bipinnate seta, 2 distal bipinnate setae, and 2 inner plumose setae.

P3 (Fig. 4A). Coxa wider than long, with outer setules and one pore as figured. Basis much wider than long, with setules on outer margin, with 1 bare outer seta. Exopod with 3 segments, a little longer than endopod; exp-1 with setules on outer margin and anterior surface, with 1 bipinnate outer spine and 1 plumose inner seta; exp-2 with outer setules as in exp-1, with 1 bipinnate outer spine and 1 plumose inner seta; exp-3 with outer setules, 3 bipinnate outer spines, 2 terminal setae, and 3 plumose inner setae. Endopod with 3 subequal segments; enp-1 with outer long setules and 1 plumose inner seta; enp-2 with outer long setules and short setules on posterior surface and with 2 plumose inner setae; enp-3 with outer long setules and short setules on posterior surface, and with 1 outer bipinnate seta, 2 distal bipinnate setae, and 3 inner plumose setae.

P4 (Fig. 4B). Coxa wider than long, with setules and one pore as figured. Basis much wider than long, with setules on outer margin, with 1 bare outer seta. Exopod with 3 segments, a little longer than endopod; exp-1 with setules on outer margin, anterior and posterior surfaces, with 1 bipinnate outer spine and 1 plumose inner seta; exp-2 with setules as in exp-1, with 1 bipinnate outer spine and 1 plumose inner seta; exp-3 with setules as in exp-2, 3 bipinnate outer spines, 2 terminal setae, and 3 plumose inner setae (middle inner seta thicker than others). Endopod with 3 subequal segments; enp-1 with outer long setules and 1 plumose inner seta; enp-2 with outer long setules and short setules on posterior surface and with 2 plumose inner setae; enp-3 with outer long setules and short setules on posterior surface, and with 1 outer bipinnate seta, 2 distal bipinnate setae, and 2 inner plumose setae.

P5 (Fig. 5C, D). Both rami completely separated. Baseoendopod small, longer than wide, ornamented with tiny setules on outer distal half surface, with 1 long pinnate seta and 4 short setae. Exopod elongated as long as about 3 times, with many setules along outer surface, with 1 bare seta on middle (about 40% proximally), 3 apical strong spines with blunt tip and 1 spine bearing 1 setule and distally fused, and 1 sharp inner process bearing 1 setule.

Description of male. Total body length ranging from 0.77−0.85 mm (n = 6), measured as in the female specimen (Fig. 1B). Urosome tapering posteriorly. Cephalothorax a little wider than long, with lots of sensilla on surface as depicted.

Urosome (Fig. 1B) 6-segmented, comprising P5-bearing somite, genital somite, third to fifth urosomites, and anal somite. Each somite bearing setules along distal margin except for last two somites.

P6 (Fig. 5G) represented by 1 strong bipinnate spine with blunt tip.

Antennule (Fig. 5E) with 7 segments; segment 1 with long anterior setules and 1 bipinnate seta; segment 2 longest; segment 5 much swollen, with aesthetasc and seta fused basally. Setal formula as follows: 1-[1 bipinnate], 2-[1 pinnate + 11 bare], 3-[6 bare + (1 + ae)], 4-[2 bare], 5-[7 bare + (1 + ae)], 6-[1 bare + 1 serrate projection], 7-[2], 8-[11 + acrothek].

Antenna, mouth appendages, and P1, P2, P3, P4 as in female.

P5 (Fig. 5F). Both rami distinctly separated. Baseoendopod elongate, with setules on distal half as depicted, armed with 1 naked seta and 1 bipinnate seta. Exopod about 2 times as long as wide, with many setules along outer margin, and with 3 strong bipinnate distal spines with blunt tip, 2 bipinnate outer setae, and 1 bare seta on anterior surface (about 40% proximally).

Table 2. Comparison based on the selected characters between *A. potter* and *A. wanae* **sp. nov.**

Characters	*A. potter*	*A. wanae* **sp. nov.**
length to width ratio of caudal ramus	as long as	1.2 times longer
setae I and III on caudal ramus	seta I < III	as long as
number of A1 segment	9	8
A2 basal seta vs basis	short	long
P1 exp-2 outer seta	reaching end of segment	not reaching end of segment
P4 exp-3	with normal seta	with big middle inner seta
length to width ratio of female P5 benp.	1.7	1.4
length to width ratio of female P5 exp.	2.4	3.1
length to width ratio of male P5 benp.	1.8	1.2
length to width ratio of male P5 exp.	2.6	2.2
male P6 elements	1 long and 2 short setae	1 strong blunt spine

Discussion

The genus *Alteutha* Baird, 1846 is characterized by dorsoventrally compressed body shape, distinct urosomites, antennule with 8 or 9 setae, P1 with 3 segments, P1 exp-3 with 3 or 4 claws, antenna with 2 or 3 segments, P2−P4 exp-3 with 7, 8, 8, P2−P4 enp-3 with 5, 6, 5 setae, and p2−p4 exp-1 with each 1 seta (Wells, 2007). The genus *Alteutha* is the second speciose genus of the family Peltidiidae, next to *Peltidium* Philippi, 1839, currently comprising 24 species (Walter & Boxshall, 2025). Among the species, only *A. depressa* was recorded with detailed figures from Jindo Island, Korea (Song and Chang, 1995). *Alteutha depressa* has known a worldwide distribution and showed some large morphological variations (Hicks, 1982). It is assumed that the species is a polymorphic species with several cryptic species under the same species name (Lee *et al*., 2012).

Alteutha wanae **sp. nov.** is most closely related to *A. potter* from the Potter cove of King George Island, Antarctica (in front of the Argentinian Jubany Station and the German Dallmann Laboratory). These two species share 1) the setation of P5 baseoendopod and exopod of both sexes, 2) the width to length ratio of basis in maxilliped, 3) the setation and its length of caudal ramus, and 4) P2−P4 exp-1 with 1 inner seta, respectively. However, the new species differs from *A. potter* in 1) caudal seta I longer than seta III (vs. seta I as long as III in *A. potter*), 2) 8-segmented antennule (vs. 9 in *A. potter*), 3) A2 basal seta longer than segment (vs. shorter than basis in *A. potter*), 4) P1 exp-2 outer seta not reaching end of segment (vs. reaching end of segment in *A. potter*), 5) P4 exp-3 with big middle inner seta (vs. with normal seta in *A. potter*), 6) length to width ratio of baseoendopod and exopod in both sexes (Table 2), and 7) male P6 with 1 strong blunt spine (vs. 1 long and 2 short setae in *A. potter*).

In addition, *Eupelte dokdoensis* Song & Lee, 2024 was newly described from Dokdo Island, Korea. The species was mainly collected from algal bed of shallow water, using light trap. However, according to Walter and Boxshall (2024), *E. dokdoensis* is unaccepted in the genus as a valid species due to not comply with ICZN art 8.5.3 (no indication of registration in ZooBank). Here, we added the registration in ZooBank of *E. dokdoensis* Song & Lee, 2024 as follow: urn:lsid:zoobank.org:act:BEBCD3AB-7193-495D-8DEA-3AC3812BE722.

Conflicts of Interest

The authors of this paper have no affiliation with any interests and is solely responsible for the paper.

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