

First Record of the Genus *Lepidepecreum* (Amphipoda: Lysianassidae: Tryphoinae) from Korean Waters

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Abstract - Despite the worldwide distributions of genus *Lepidepecreum* and the previous reports from China and Japan, this genus has not yet been recorded in Korean waters. In this study, Korean materials of lysianassid amphipods are assigned readily to the genus *Lepidepecreum* and identified as *L. vitjazi* Gurjanova, 1962 based on the following features: well-developed dorsal keels of the pleonite 3 and urosomite 1; unconcaved palmer margin of ganthopod 1; hooked locking spines of propodus on pereopods 3 and 4; and the shape of coxa 4. We also provide the description and illustrations of this species.

Key words: *Lepidepecreum vitjazi*, lysianassid, amphipod, taxonomy, Korea

INTRODUCTION

Lysianassidae Dana, 1849 is a very large group in gammarideans, consisted of 86 genera, and might be divided into three subfamilies by various taxonomic concerns; Conicostomatinae Lowry and Stoddart, 2012, Lysianassinae Dana, 1849 and Tryphosinae Lowry and Stoddart, 1997 (Barnard and Karaman 1991; Lowry and Stoddart 1997; Wikispecies 2015; WoRMS 2015). Subfamily Tryphosinae, which is designated from *Tryphosa* as the type genus by Lowry and Stoddart (1997), is the largest group including half genera of the family Lysianassidae. Among them, the genus *Lepidepecreum* is clearly distinguished from other genera by the combination of an elongated peduncular article 3 on antenna 2 and a long carpus on gnathopod 1 (Lowry and Stoddart 2002). Although 37 species of this genus are recorded from most parts of the world oceans, nothing is known about their ecological behavior (Lowry and Stoddart 2002; WoRMS

2015), and none have been reported from Korean waters until now.

In this study, the genus *Lepidepecreum* is first reported in Korean waters by the discovery of *L. vitjazi* Gurjanova, 1962, and we provide the description and illustrations.

MATERIALS AND METHODS

Specimens were collected by using a light trap in the subtidal and by washing of algae with a sieve in the intertidal from the Island Bogildo on the southwestern coast of Korea. They were preserved directly in 95% ethyl alcohol after collection. Before identification, samples were stained by lignin pink dyes and the appendages were dissected in a Petri dish filled with glycerol using dissection forceps and needle under stereomicroscope (SZH10; Olympus, Tokyo, Japan). They were mounted on a temporary slide using a glycerol-ethanol mixed solution or on a permanent slide using polyvinyl lactophenol solution. Drawings were performed by light microscope (LABOPHOT-2; Nikon, Tokyo) with the aid of a drawing tube.

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SYSTEMATIC ACCOUNTS

Order Amphipoda Latreille, 1816 단각 목
 Suborder Gammaridea Latreille, 1816 옆새우 아목
 Family Lysianassidae Dana, 1849 긴팔옆새우 과
 Subfamily Tryphosinae Lowry and Stoddart, 1997
 어금니긴팔옆새우 아과 (신칭)
 Genus *Lepidepcreum* Bate and Westwood, 1868
 큰터듬이옆새우 속 (신칭)

Lepidepcreum vitjazi Gurjanova, 1962

마루큰터듬이옆새우 (신칭)

Synonyms: *Lepidepcreum vitjazi* Gurjanova, 1962: 338, fig. 112; Nagata, 1965: 145; Hirayama, 1985: 197, figs. 185-188.

Material examined: Korea: 1♂, Jeollanam-do, Wando-gun, Isl. Bogildo, Yesong-ri, 34°08'05"N, 126°33'30"E, 1 Feb 2010, by washing of algae using a sieve, intertidal, collected by Kim JG; 1♀, Port Book, 34°07'39"N, 126°30'46"E, 13 Apr 2015, by a light trap (depth of 3~4 m), collected by Jung TW.

Description: Male: Body (Fig. 1A) robust, much compressed. Dorsal keel of pleonite 2 weak, pleonite 3 and urosomite 1 with well-developed dorsal keels, their margin densely pubescent with short setule and setae. All pleonal epimera subquadrate; epimeron 1, anterodistal margin pubescent; epimeron 2, distal margin also pubescent anteriorly and weakly angulate posteriorly; epimeron 3 slightly dilated anterodistally, posteroventral corner weakly produced, with several minute setae (Fig. 1A, E).

Head (Fig. 1A, B), dorsal margin including rostrum slightly longer than pereonite 1. Anterior cephalic lobe triangular, apex weakly sinuated, reaching basal part of flagellum of antenna 1. Eyes large, reniform.

Antenna 1 (Fig. 1C). Peduncular article 1 robust, enlarged; anterior margin equal to that of head in length, anterodistal margin foming keel, produced distally but apex round, beyond middle of peduncular article 2, with several groups of surge setae at anteroproximal and distal margins. Peduncular articles 2, 3 short, gradually diminished in width, proximal part of article 2 submerged in cylindrical distal part of article 1. Accessory flagellum short, 3-articulate, each with several

long distal setae. Flagellum shorter than dorsal margin of peduncular article 1, 6-articulate, drastically diminished in width; each segment with several long aesthetascs.

Antenna 2 (Fig. 1D) slender. Peduncular article 3 longer than article 4. Peduncular article 4 with pair of surge setae at anterodistal corner. Peduncular article 5 about 2/3 as long as article 3, a little dilated distally. Flagellum equal to peduncular articles 4, 5 combined in length, 6-articulate; each segment with long distal setae.

Gnathopod 1 (Fig. 2A, B). Coxa subrectangular; anterodistal corner dilated weakly. Basis longer than other articles combined in length; anterior margin lined with several setae, slightly swollen distally; posterodistal corner with unequal paired setae. Ischium with small anterior lobe, with unequal paired setae near posterodistal corner. Merus triangular; posterior margin convex and pubescent, with set of 2 long and 1 short setae near distal corner, posterodistal corner produced and weakly upturned. Carpus subequal to ischium, merus combined in length; proximal margin truncated obliquely; anterior margin bare; posterior margin weakly lobate, pubescent, distal corner with set of 3 setae. Propodus rectangular, subequal to carpus in length; anterodistal corner with row composed of several long setae; palm obliquely transverse, straighten, pectinate; defined by stout spine. Dactylus falcate, with protrusion near apex.

Gnathopod 2 (Fig. 2C, D) longer than gnathopod 1. Coxa subrectangular, weakly expanded posterodistally; distal and posterodistal margins lined with short setae. Basis subequal to, but slender than that of gnathopod 1, somewhat dilated distally; anterior margin with just seta distomesially. Ischium elongate, as long as half of basis; anterior margin not lobate. Merus as long as half of posterior margin of ischium in length; anterior margin short; posterior margin, distal half swollen and weakly pubescent, with set of 3 long setae. Carpus, anterior margin subequal to posterior margin of ischium, distal half lined with short setae, anterodistal corner with set of 1 long and pair of short setae; posterior margin lobate, surface of distal 2/3 pubescent. Propodus about half of anterior margin of carpus in length, slightly dilated distally; surface of distal half densely pubescent; anterior margin, distal half with 1-2-3-4 stout spines in formula; palm chelate. Dactylus short, fitting palm.

Pereopod 3 (Fig. 2E, F). Coxa similar to that of gnathopod 2. Basis grandually widening in width, as long as that

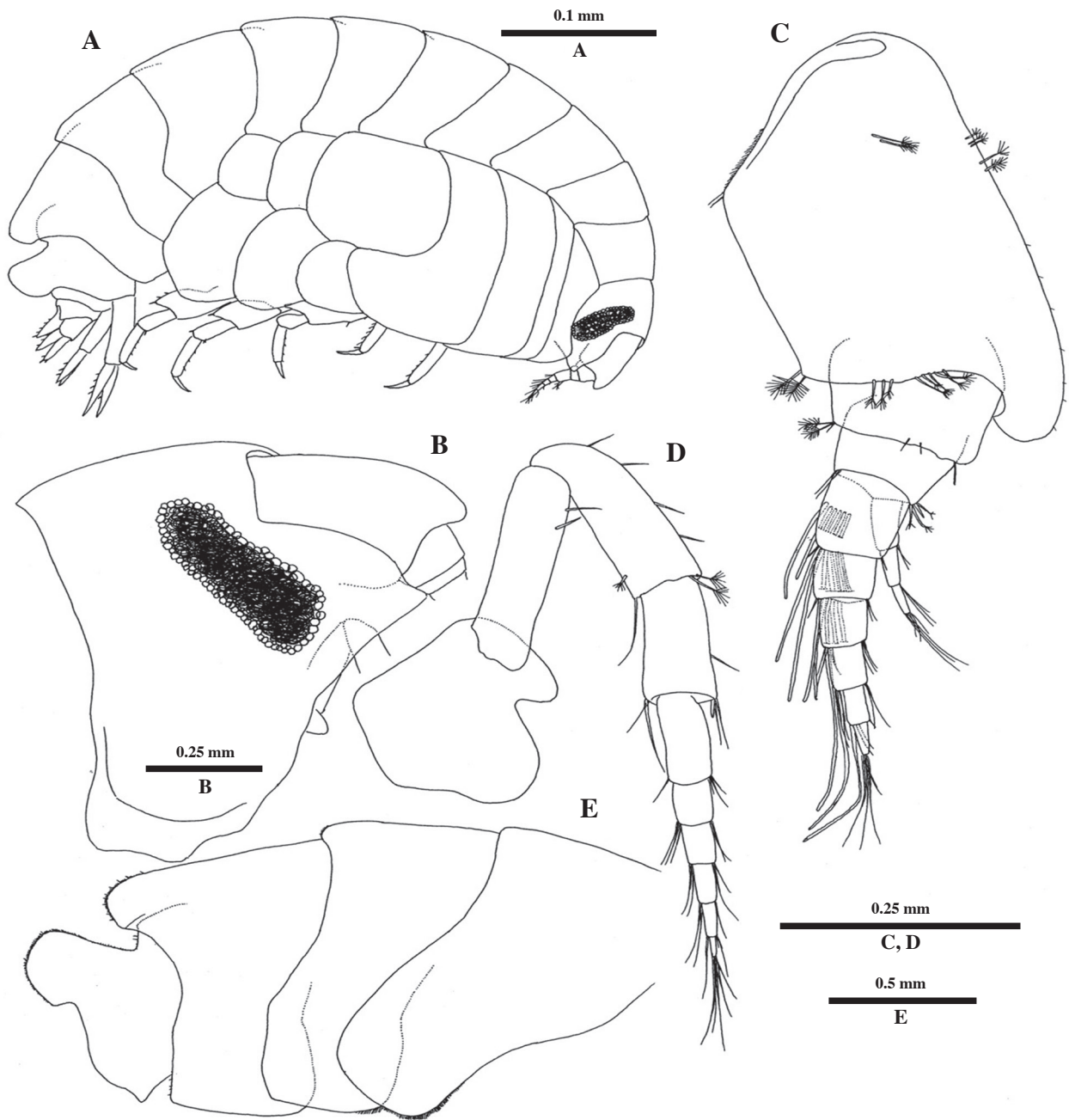


Fig. 1. *Lepidepecreum vitjazi* Gurjanova, 1962, male. A, habitus; B, head; C, antenna 1; D, antenna 2; E, pleonal epimera and urosomite 1.

of ganthopod 1; posterodistal corner with unequal paired setae. Ischium short; anterior lobe small; posterior margin with several setae in turn. Merus as long as half of basis; anterior margin lobate, distal corner bluntly produced, with set of 3 setae; posterior margin lined with several setae. Carpus slender, slightly shorter than anterior margin of merus; posterior margin pubescent, with 3 setae, distal

corner with 4 setae. Propodus also slender, slightly longer than carpus; posterior margin pubescent, lined with 5 pairs of 1 spine and 1 short seta, with paired locking spines those hooked distally. Dactylus falcate, shorter than half of propodus.

Pereopod 4 (Fig. 2G, H). Coxa, distal 2/3 of posterior margin broadly expanded backward; distal margin and this

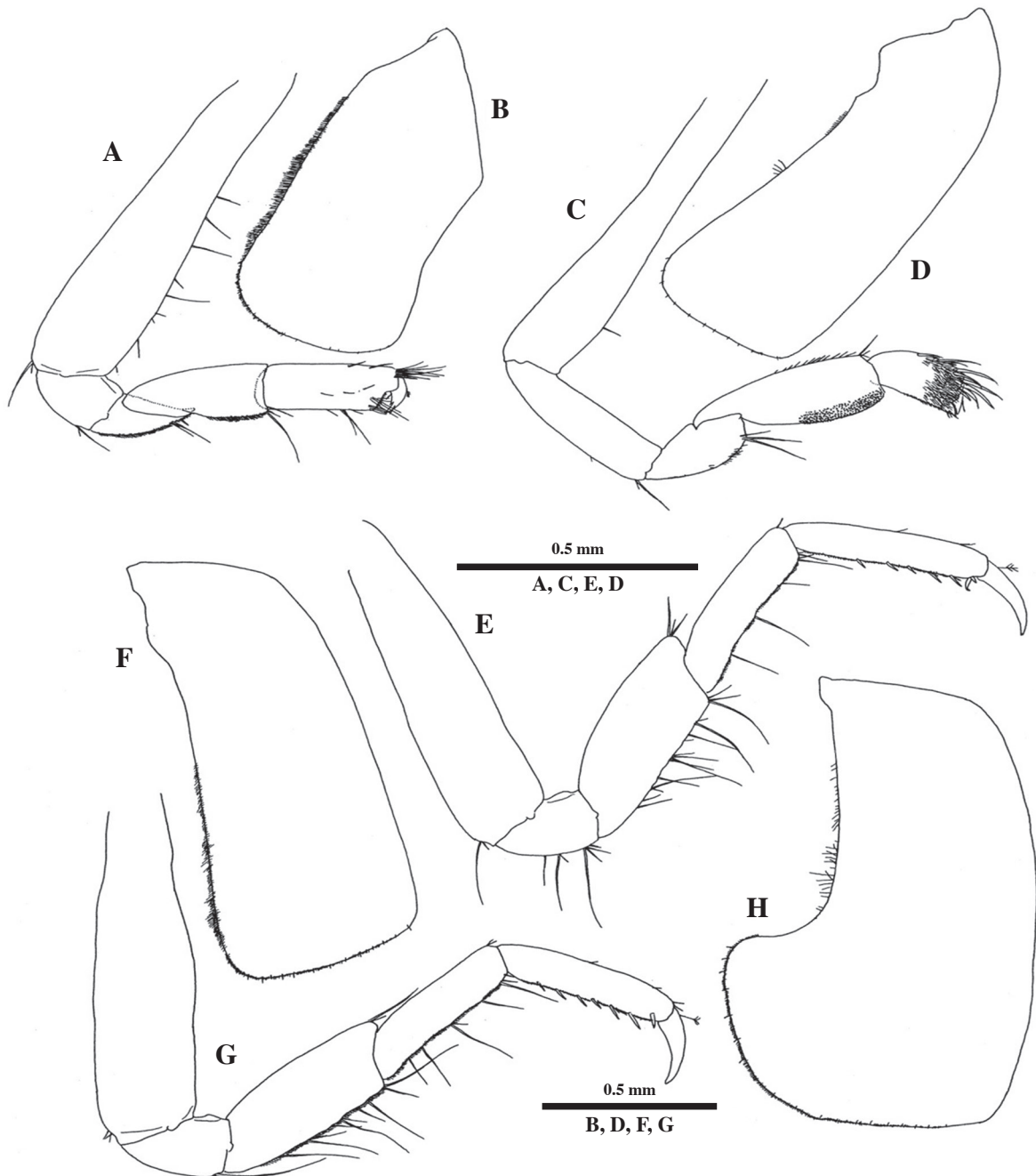


Fig. 2. *Lepidepecreum vitjazi* Gurjanova, 1962, male. A, gnathopod 2; B, coxa 2; C, gnathopod 1; D, coxa 1; E, pereopod 3; F, coxa 3; G, pereopod 4; H, coxa 4.

expansion pubescent and lined with minute setae. Other articles similar to pereopod 3 in shape, except for number of setae and spines.

Pereopod 5 (Fig. 3A). Coxa largest, subquadrate; anterior margin naked; posterior margin, ventral corner obliquely truncated, weakly crenulate and pubescent, lined with min-

ute setae. Basis smaller than coxa, almost circular; anterior margin pubescent, weakly sinuated, lined with 14 spines, distal corner with pair of spines; posterior margin pubescent, weakly crenulate, lined with minute setae. Ischium short; anterior margin weakly pubescent, with small distal seta; posterior lobe small. Merus, anterior margin pubes-

cent, with small spines and long setae; posterior lobe largely expanded backward, margin also pubescent with 2 long setae, distal corner produced with spine, beyond middle of carpus. Carpus rectangular, as long as 2/3 of merus; anterior margin pubescent, with 2 mesial and 1 distal spines. Propodus slender, subequal to anterior margin of merus in length; anterior margin pubescent, lined with 3 spines and pair of distal locking spines; posterior margin with minute setae. Dactylus falcate, long, as long as half of propodus.

Pereopod 6 (Fig. 3B) larger than pereopod 5. Coxa, ventral margin weakly bilobate, small anterior lobe weakly pubescent anteriorly; posterior lobe somewhat dilated posterodistally, weakly pubescent and with 3 minute setae posterodistally. Basis enlarged, longish oval in shape, longer than coxa of pereopod 5, dilated posterodistally; anterior margin slightly flattened, distal 3/4 densely pubescent and weakly sinuated, lined with 15 spines and 1 pair of distal spines; posterior margin weakly crenulate and pubescent, lined with minute setae. Ischium larger than that of pereopod 5; anterior margin pubescent, with 1 mesial and 1 distal long setae; posterior lobe small. Merus, anterior margin pubescent, with 4 long mesial and 1 distal setae; posterior margin expanded backward, also pubescent, with 3 mesial and 1 distal spines, distal corner produced, but not reaching middle of carpus. Carpus rectangular, as long as 2/3 of merus; anterior margin pubescent, with pair of distal spines. Propodus slender, subequal to anterior margin of merus; anterior margin pubescent, with 3 spines and pair of distal locking spines; posterior margin with minute setae. Dactylus falcate, long, as long as half of propodus.

Pereopod 7 (Fig. 3C) slightly shorter than pereopod 6. Coxa unilobate, suboval, smaller than that of pereopod 6; anterior and posteroventral corner pubescent. Basis largely expanded, slightly larger than that of pereopod 6; anterior margin more flattened than that of pereopod 6, weakly sinuated mesially, anteroproximal corner densely pubescent, distal 3/4 weakly crenulate, lined with 11 spines, distal corner with pair of spines; posterior margin weakly crenulate and pubescent, lined with minute setae, proximal and near distal corner weakly angulate, distal corner somewhat expanded downward, reaching middle of merus. Ischium and merus similar to those of pereopod 6. Carpus longer than that of pereopod 6; anterior and posterodistal corners pubescent; anterior margin with 2 mesial and set of distal 3 spines.

Propodus slender, subequal to anterior margin of merus; anterior margin pubescent, with 1-2-2 spines and pair of distal locking spines in formula; posterior margin with minute setae. Dactylus falcate, long, as long as half of propodus.

Uropod 1 (Fig. 3D) biramus, extending tip of uropod 2. Peduncle longer than rami, gradually diminished in width, dorsomedial and -lateral margins with 9 and 7 spines, respectively. Each ramus lanceolate, subequal in length but inner ramus not reaching tip of outer ramus in position. Inner ramus, dorsal margin with 3 lateral and 1 medial spines. Outer ramus with 5 dorsomedial spines.

Uropod 2 (Fig. 3E) similar to uropod 1 in shape. Peduncle, dorsomedial and -lateral margins with 4 and 6 spines, respectively. Each ramus also lanceolate, subequal in length but inner ramus not reaching tip of outer in position. Inner ramus, dorsal margin with 2 medial and 1 lateral spines. Outer ramus, dorsal margin with 4 lateral spines.

Uropod 3 (Fig. 3F) slightly shorter than peduncle of uropod 1. Peduncle stout, equal to each ramus in length, dorsomedial and -lateral margins with 1 and 2 spines, respectively. Inner ramus, medial margin pubescent, with 3 spines, lateral margin with 1 spine. Outer ramus biarticulate, medial margin with long plumose seta mesially and spine near apex, lateral margin with spine and seta distally, distal segment short, produced apically.

Telson (Fig. 3G) as long as 2/3 of uropod 3; deeply cleft; outer margin of each lobe with stout spines; apex roundish produced, with 1 large spine and 1 surge seta.

Remarks: In Japanese waters, *Lepidepcreum vitjazi* was recorded in Seto Inland Sea by Nagata (1965) and Shijiki Bay by Hirayama (1985). Nagata (1965) mentioned that the Japanese specimens were consistent well with the original description and figures of *L. vitjazi* (Gurjanova 1962), except for the following features: the absence of oblique setal row on surface of coxa 1; five pairs of spines on dorsal surface of telson; and the feebly carinate, but not upturned dorsal keel of pleonite 3. The Korean specimens examined in this study also show these features. In Hirayama (1985)'s report, Japanese specimens showed other differences with original description as follows: the length of accessory flagellum of antenna 1 is subequal to first proximal segment of flagellum; the palmer margin of ganthopod 1 is somewhat concave; the basis of pereopod 5 is wider; the carination of dorsal keel of pereonite 3 is weaker; the number of long setae of rami on

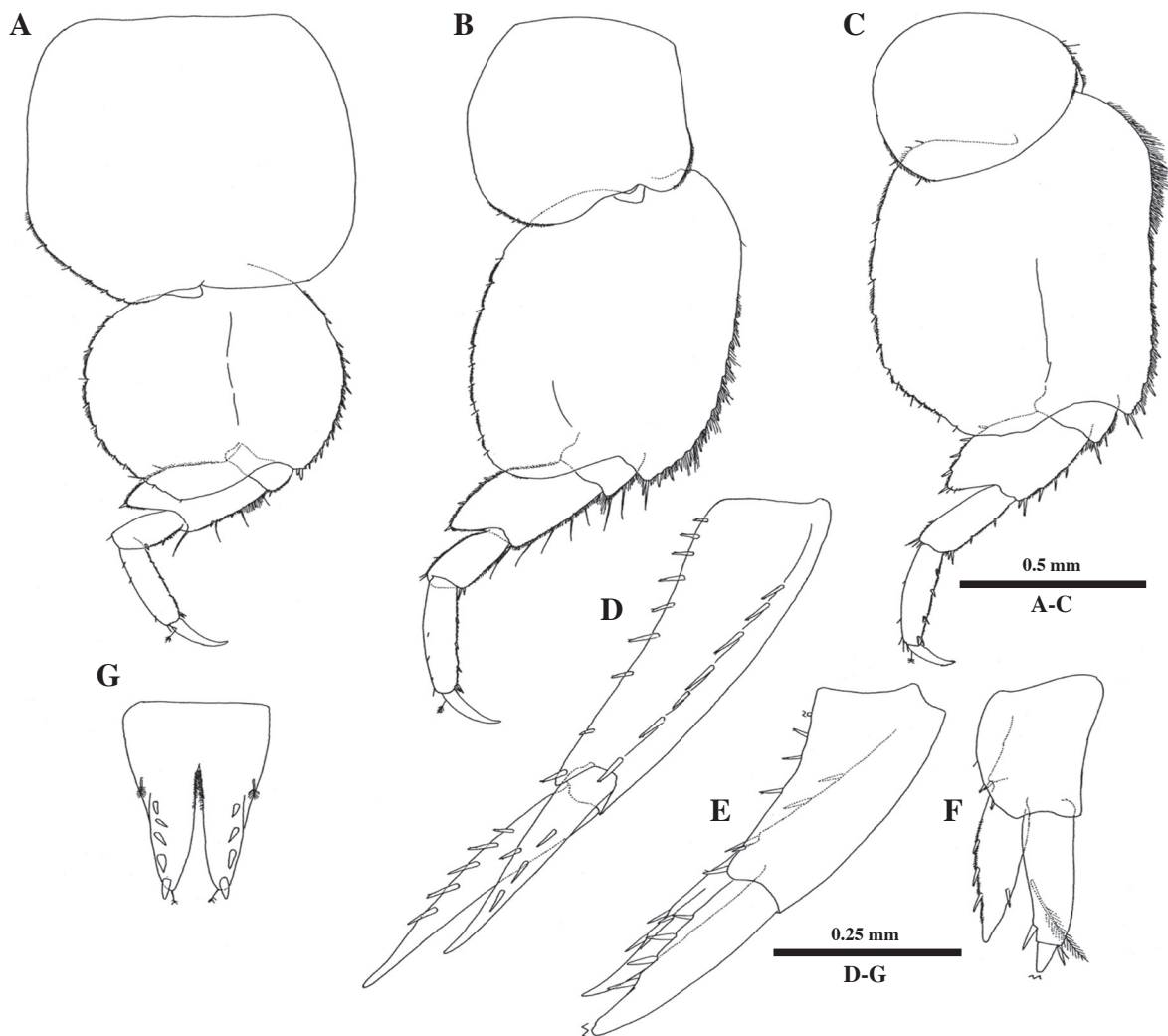


Fig. 3. *Lepidepecreum vitjazi* Gurjanova, 1962, male. A, pereopod 5; B, pereopod 6; C, pereopod 7; D, uropod 1; E, uropod 2; F, uropod 3; G, telson.

uropod 3 is lower.

Initially, having only male specimen, the authors were very confused by the above differences between the specimens reported as *L. vitjazi* from different areas in the Far East. Later, we could collect one female specimen from the same area of Isl. Bogildo, and could solve the problems of sexual dimorphism about the difference length of first segment of flagellum on antenna 1, setation of rami on uropod 3, and the shape of dorsal keels of pleonite 3 and urosimite 1. Consequently, we could identify our specimens as *L. vitjazi* based on the following features: the well developed dorsal keels of pleonite 3 and urosimite 1; not concaved palm of ganthopod 1; the similar shapes of carpus and propodus

on gnathopod 2; hook-shaped locking spines of propodus on pereopods 3 and 4; and the deeply cleft telson bearing several pairs of spines on surface. However, some minor differences between them mentioned above, are still in need of further study.

Habitat: Two specimens examined in this study were collected from rocky shore with some algae of Isl. Bogildo, Korea.

World distribution: Russia (Gurjanova 1962), Japan (Nagata 1965; Hirayama 1985), Korea.

Deposition: KOSPIV0000223810.

Identifiers: Tae Won Jung, Seong Myeong Yoon.

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