

## New Records on Three Harpacticoid Copepods Associated with Marine Macroalgae in Korea

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(Received October 1999, Accepted December 1999)

Three harpacticoid copepods, *Dactylopodamphiascopsis latifolius* (Sars, 1909), *Diosaccus ezoensis* Ito, 1974 and *Ambunguipes rufocincta* (Brady, 1880) are recorded as new to the Korean fauna with illustrations, on the basis of the specimens collected mainly from the marine macroalgae during the period from June 1990 to September 1997.

Key words: Taxonomy, Copepoda, Harpacticoida, Ambunguipedidae, Diosaccidae, Korea.

### Introduction

The present study deals with three harpacticoid species, *Dactylopodamphiascopsis latifolius* (Sars, 1909), *Diosaccus ezoensis* Ito, 1974 and *Ambunguipes rufocincta* (Brady, 1880), which are newly reported from Korean waters. They are common and frequently occurred at the algal beds of littoral or sublittoral rocky shore of East Sea and South Sea in Korea.

All of them needs the ongoing taxonomic reconsiderations as the following reasons. the original description of *D. latifolius* was poorly prepared without any adequate redescription thereafter. In case of *A. rufocincta* previously belonging to the genus *Rhynchothalestris* of family Thalestridae was accommodated to the new genus *Ambunguipes* with the establishment of the family Ambunguipedidae by Huys (1990). *D. ezoensis* is the second record since Ito's (1974) original description. We provide redescription of *D. latifolius* and brief taxonomic remarks on *D. ezoensis* and *A. rufocincta* with the illustrative figures.

### Materials and Methods

The materials examined in the present study were

obtained by washing out the macroalgae (*Ulva pertusa*, *Caulerpa okamurae*, *Sargassum siliquastrum*, etc.) on the shallow sublittoral rocks, or collected with a light trap. Samples were fixed with 5~8% formalin, and preserved in 95% ethyl alcohol. All the specimens were dissected, figured and measured in lactophenol on the Cobb's hole slide. Figures were made with the aid of a drawing tube. All specimens examined are deposited in the Department of Biology, Taegu University.

### Systematic Accounts

Family Diosaccidae Sars, 1906

Genus *Dactylopodamphiascopsis* Lang, 1948

1. *Dactylopodamphiascopsis latifolius* (Sars, 1909) (Figs. 1~3)

*Amphiascus latifolius* Sars, 1909 (p. 28, pl. 7); Sars, 1911 (p. 379, Suppl. pl. 16).

*Dactylopodamphiascopsis latifolius*: Lang, 1948 (p. 672, fig. 272); Tschislenko, 1977 (p. 248, pl. 7, figs. 9~10).

Materials Examined. 2♀♀, Namae, Yangyang-gun, June 2, 1990; 2♀♀ (1 ovi.), Taeha-ri, Ullung Is., Aug. 10, 1992; 2♀♀, Wolpo, Youngil-gun, Jan. 14, 1991; 1♀ (ovi.), Tongdo, Tokdo Is., Aug. 14, 1995; 1♀ (ovi.), Kuryongpo, Oct. 24, 1996; 1♀, Kuryongpo, Feb. 23, 1997; 1♂, Kuryongpo, Apr. 25, 1997; 3♀♀ (ovi.), 2♂♂, Masan-ri, May 25, 1997.

Female. Body (Fig. 1A) dorsolaterally depressed,

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This research was supported by the Taegu University Grant, 1999

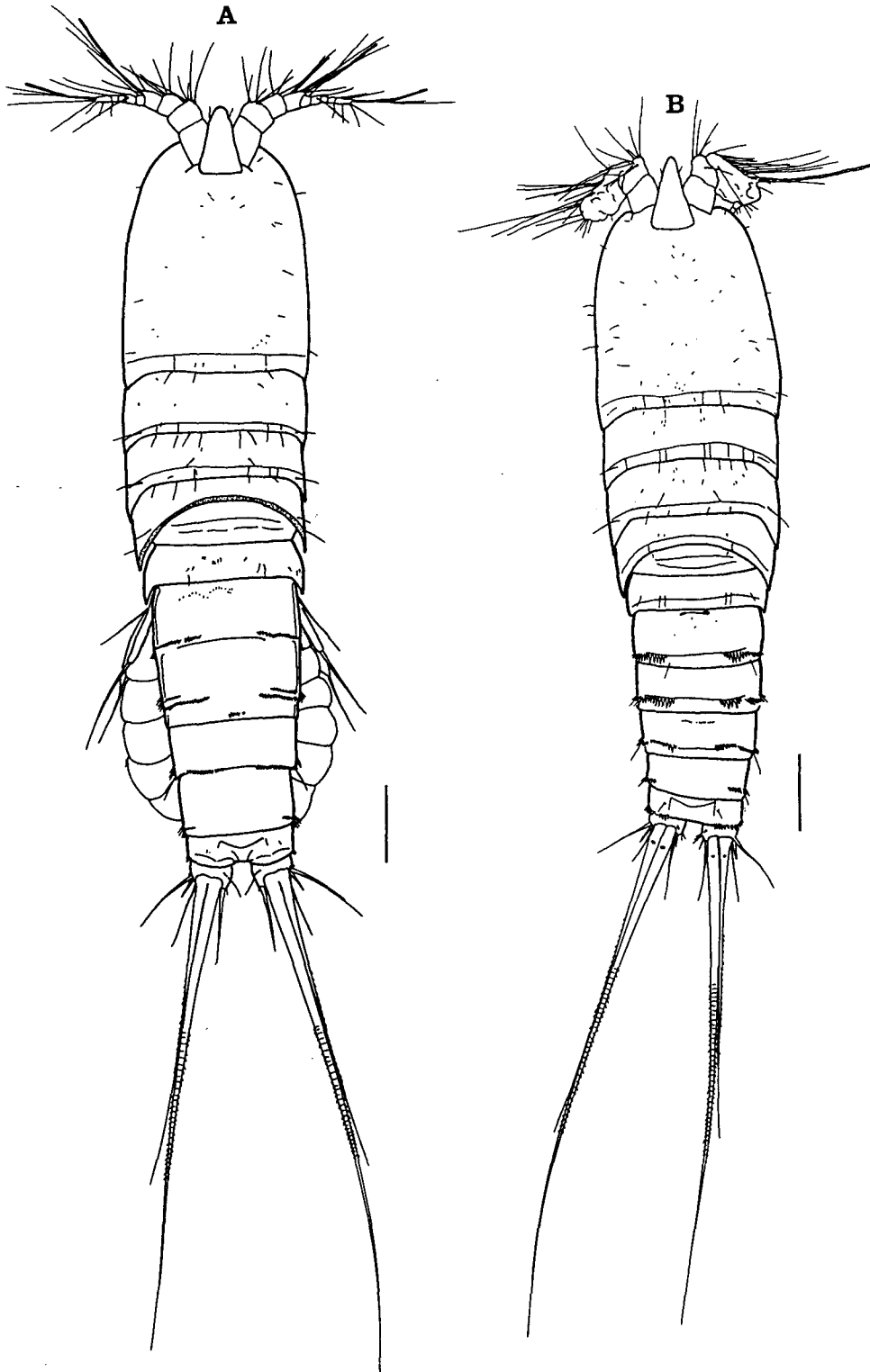


Fig. 1. *Dactylopodamphiascopsis latifolius* (Sars), female: A, habitus, dorsal. male: B, habitus, dorsal. (Scale bars=0.1 mm)

tapering behind 0.95 mm long excluding rostrum and caudal setae. Cephalothorax about 1.26 times longer than wide with scattered small hairs. Rostrum (Fig. 2B) prominently directed downward

and defined at base. Genital double somite fully fused on ventral side, but with an incomplete line of subdivision on dorsal surface. Each abdominal somite bearing a row of setules on outerdistal

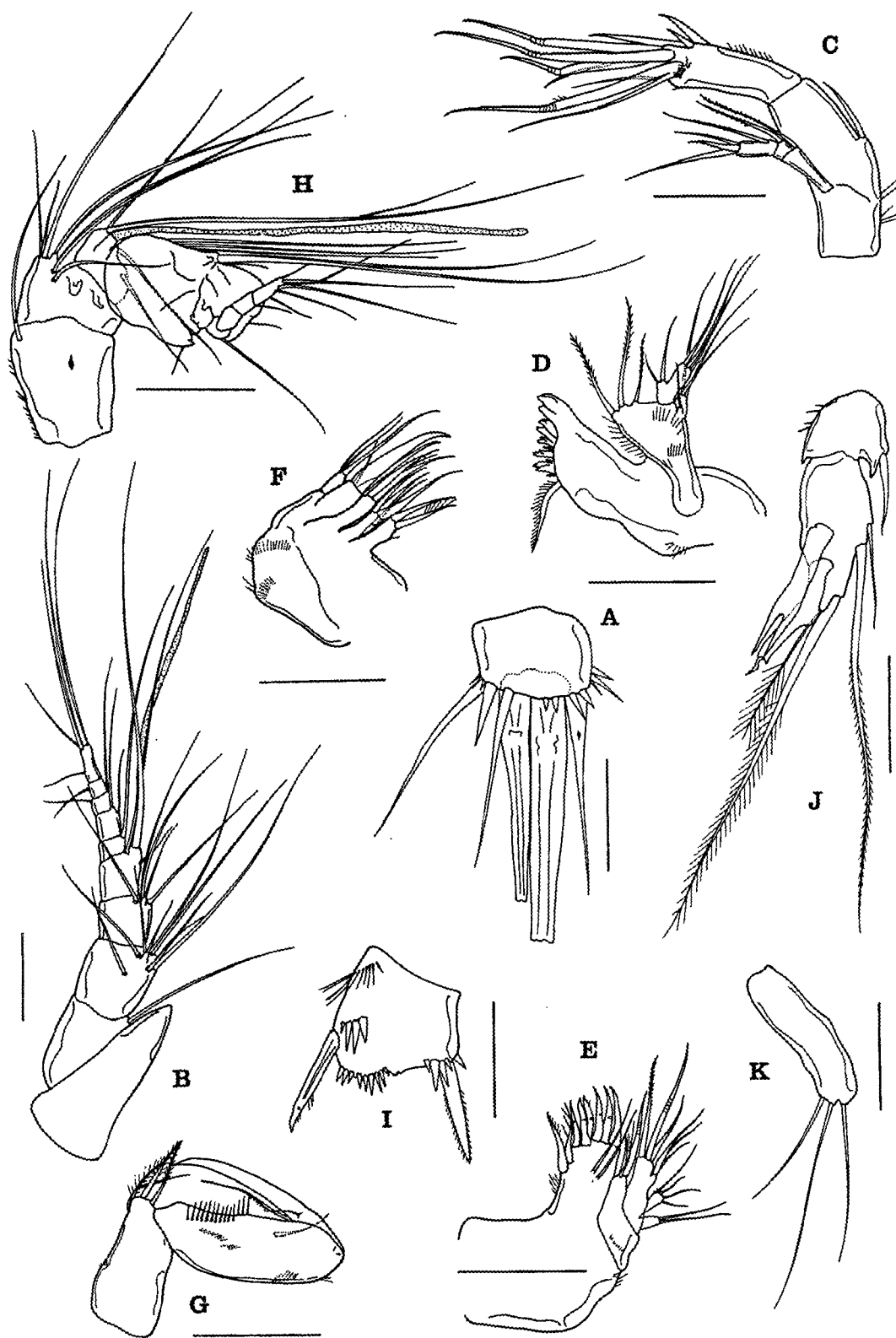


Fig. 2. *Dactylopodamphiascopsis latifolius* (Sars), female: A, caudal ramus; B, rostrum and antennule; C, antenna; D, mandible; E, maxillula; F, maxilla; G, maxilliped. male: H, antennule; I, basis of leg 1; J, endopod of leg 2; K, leg 6. (Scale bars=0.05 mm)

corner. Caudal ramus (Fig. 2A) slightly directed outward, about 1.26 times wider than long, with 1 normal terminal setae and 5 setae.

Antennule (Fig. 2B) 9-segmented; aesthetascs each on tip of fourth and distal segment; first segment longest and distal segment about 2 times longer than 8th. Antenna (Fig. 2C) with allobasis about 2.75 times as long as maximum width, with a hairy seta on midst. Exopod distinctly 3-segmented; first segment much shorter than second one, bearing 1 pinnate seta near distal edge; second one with 1 subdistal seta; distal one with 1 inner seta and 3 distal setae, outermost of which longest. Endopod armed with 3 strong claws along inner distal corner, 4 long geniculate spines, and 3 slender setae.

Coxa of mandible (Fig. 2D) elongate, with strong bidentate gnathobase bearing 1 pilose seta. Basis somewhat widened distally ornamented with fine hairs along inner margin and several clusters of tiny hairs on surface and bearing 3 setae. Exopod small with 1 hairy seta on midst and 2 setae apically. Endopod well developed, proximal half much expanded inwards and with 2 spinulose setae and over 4 setae on distal end. Praecoxal arthrite of maxillula (Fig. 2E) oblong, 2 parallel setae on middle surface, and 2 setae and 6 teeth along inner margin. Coxa furnished with 4 setae, of which 1 seta thickened. Basis well-developed, with each 3 setae on subdistal and distal end. Exopod cylindrical, with 2 long setae and endopod bearing 4 tiny setae. Syncoxa of maxilla (Fig. 2F) with 3 endites: proximal one slightly thicker than others with 3 well developed setae; second one with 3 setae; distal one bearing 3 plumose setae. Basis bearing a strong terminal claw with 2 setae. Endopod represented by small segment with 3 setae. Maxilliped (Fig. 2G) prehensile. Basis slightly tapering distally with 4 setae on distal corner. Endopod elongate with a spinular row along inner margin; a stout claw as well as endopod, bearing 2 setae.

Coxa of leg 1 (Fig. 3A) as long as wide, with many spinules along outer margin. Basis slightly longer than wide, with 1 disteromedial spine and 1 inner spine. Exopod distinctly 3-segmented; first segment short, with a spine on outerodistal edge and many spinules near it; second one longest about 5.60 times longer than wide, bearing a spine in three quarters of outer margin, with a seta on inner subdistal edge and many spinules along outer

margin; distal one shortest, wider than long with 3 strong spines, 1 geniculate spine and 1 slender seta. Endopod as long as exopod, consisting of 3 segments; first segment longest about 8.7 times longer than wide with 1 seta near one eighth on inner margin, and armed with minute spinules along both margins; second one somewhat longer than wide with 1 bare seta on inner distal end; third one slightly wider than long, with 2 strong claws, outer one about 2 times longer than inner one. Rami of legs 2-4 (Figs. 3B-D) 3-segmented. Ornamented as follows:

Leg 2 basis 0-1	exopod	1-I, 1-I, 2-2-III
	endopod	1-0, 2-0, 1-2-I
Leg 3 basis 0-1	exopod	1-I, 1-I, 3-2-III
	endopod	1-0, 2-0, 3-2-I
Leg 4 basis 0-1	exopod	1-I, 1-I, 3-2-III
	endopod	1-0, 1-0, 2-2-I

Distal end of baseoendopod in leg 5 (Fig. 3E) not reaching tip of exopod; baseoendopod not confluent in its base, bearing 5 setae with a few spinules on both margins and inter-setae, middle one longest. Exopod rather oval, tapering posteriorly, about 1.43 times as long as broad, with several spinules on inner margin; bearing 6 setae in total.

Male. Body (Fig. 1B) length 0.73 mm, excluding rostrum and caudal setae. General body shape similar to that of female, but its color more pale. Antennule (Fig. 2H) 10-segmented, of which first one longest; aesthetascs each on fourth and distal one. Distal segment of endopod in leg 2 modified as shown in Fig. 2J, bearing 2 modified spines on margin, 1 bare and 1 plumose setae on inner margin and 2 plumose setae apically. Distal end of baseoendopod in leg 5 (Fig. 3F) not reaching exopod, bearing 2 setae, confluent at its a third, with 2 inner setae, innermost of which 1.5 times longer than outer one. Exopod 1.70 times longer than wide with 6 setae and spines in total as female. Leg 6 (Fig. 2K) represented by a oblong process with 3 long apical setae.

Remarks. *D. latifolius*, the monotypic species of genus *Dactylopodamphiascopsis*, was first described from Norway by Sars (1909) with inadequacy, and then Lang (1948) placed it under the genus *Dactylopodamphiascopsis*. Thereafter any other taxonomic accounts has not been provided except Tschislenko's (1977) incomplete amendment with the drawings of only genital somite and leg 5.

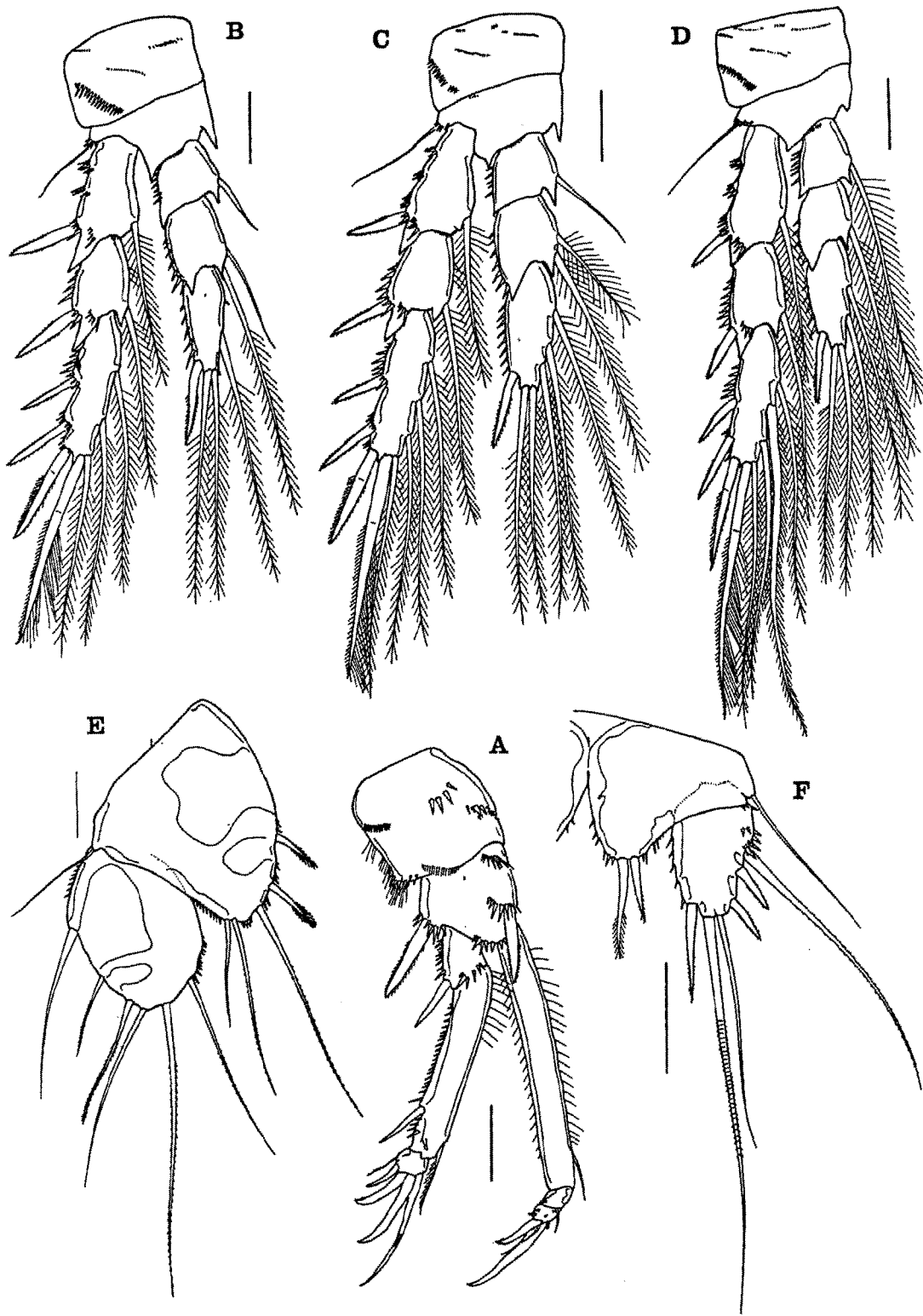


Fig. 3. *Dactylopodamphiascopsis latifolius* (Sars), female: A-E, legs 1-5. male: F, leg 5. (Scale bars mm)

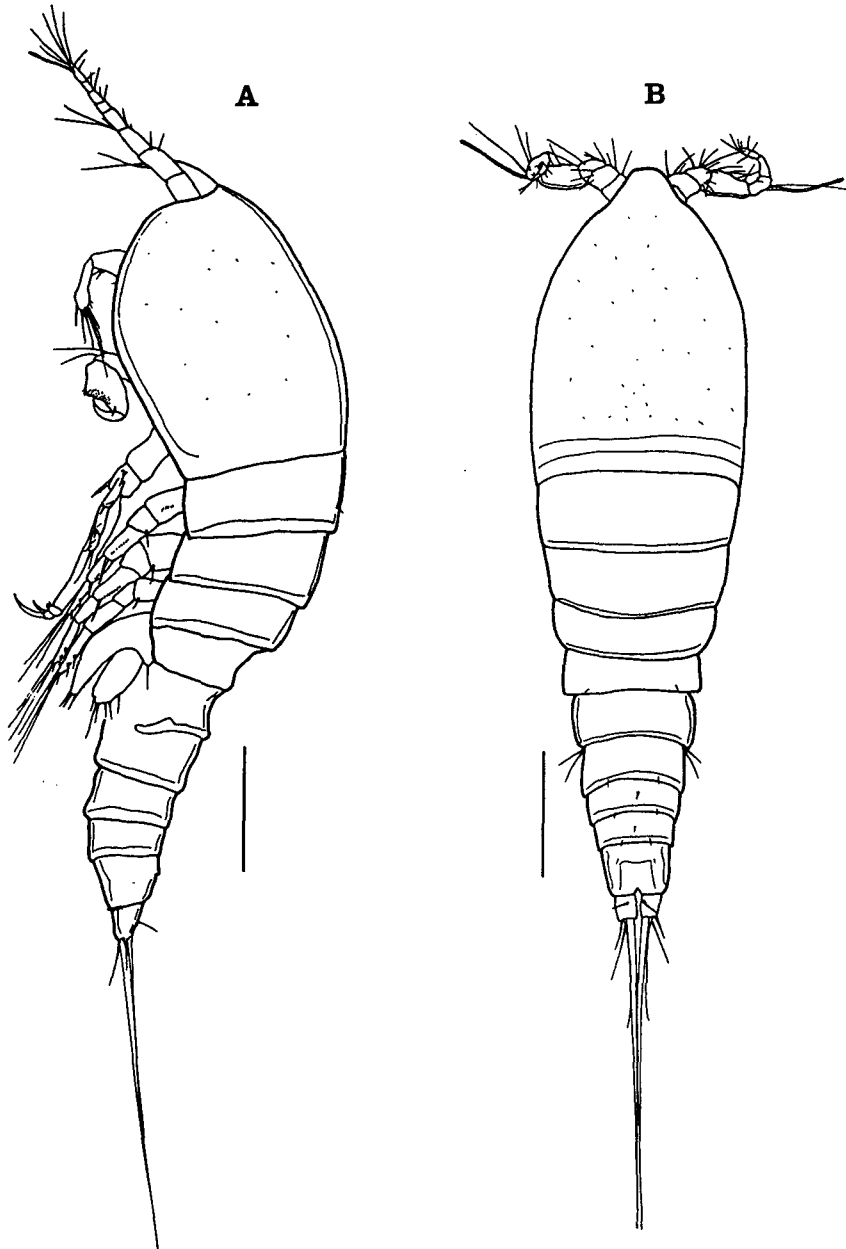


Fig. 4. *Diosaccus ezoensis* Ito, female: A, habitus, dorsal. male: B, habitus, dorsal. (Scale bars=0.2 mm)

Our specimens are similar to Sars' (1909) original description rather than Sars' (1911), but they have some differences with the latter as follows: (1) exopod of female leg 1 as long as endopod; (2) second outermost seta of leg 5 exopod in female shorter than first one clearly; (3) same lengths in two innermost setae of baseopod in female; (4) two outer spines of leg 2 endopod in male modified sharply.

**Distribution.** Norway, North America, Iceland, Korea (East Sea: from *Ulva pertusa* and several macroalgae).

Genus *Diosaccus* Boeck, 1872

2. *Diosaccus ezoensis* Ito, 1974 (Figs. 4~5)  
*Diosaccus ezoensis* Ito, 1974 (p. 611, figs. 33~36).  
**Materials Examined.** 1♀, Namae, Yangyang-gun,

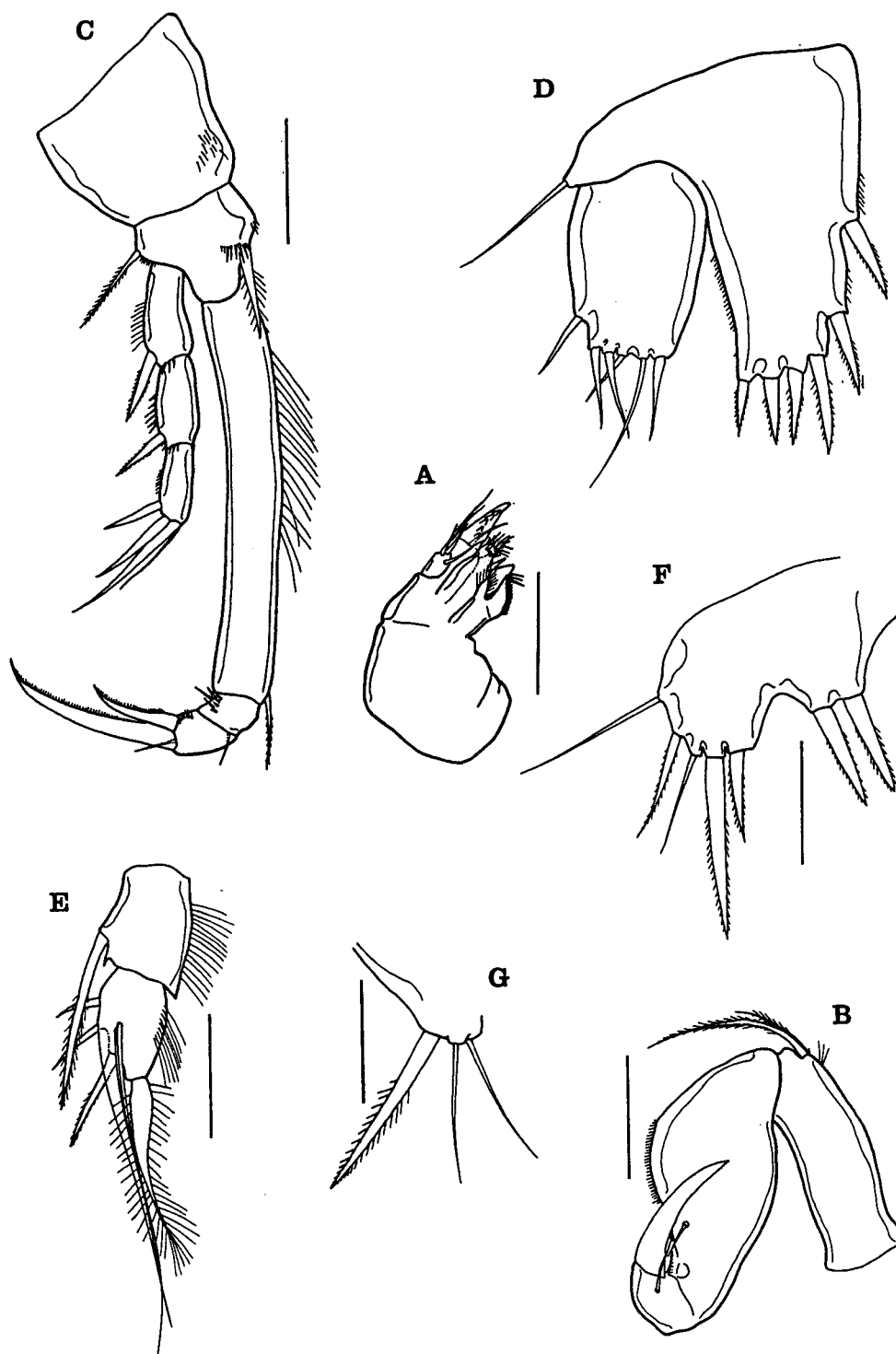


Fig. 5. *Diosaccus ezoensis* Ito, female: A, maxilla; B, maxilliped; C, leg 1; D, leg 5, male. E, endopod of leg 2; F, leg 5; G, leg 6. (Scale bars=0.05 mm)

Jan. 15, 1991; 2♀ ♀, Samchonpo, Jan. 31, 1991; 2♀ ♀, Namae, Yangyang-gun, May 8, 1993; 3♀ ♀ (1 ovi.), Jungmun, Cheju Is., Jan. 24, 1994; 1♀, 1♂, Songjung, Pusan, May 20, 1994; 2♀ ♀ (1 ovi.), 1♂, Chunbu, Ullung Is., Mar. 2, 1995; 1♀ (ovi.), 1♂, Taeha-ri, Ullung Is., Mar. 4, 1995.

**Remarks.** Our specimens are fully coincided with Ito's (1974) elaborate original description and illustrations, but ours have two minor discrepancies as follows: (1) distal seta on exopod of fifth leg in female apparently longest (Fig. 5D), while in Ito's, it is almost same in length; (2) distal segment of

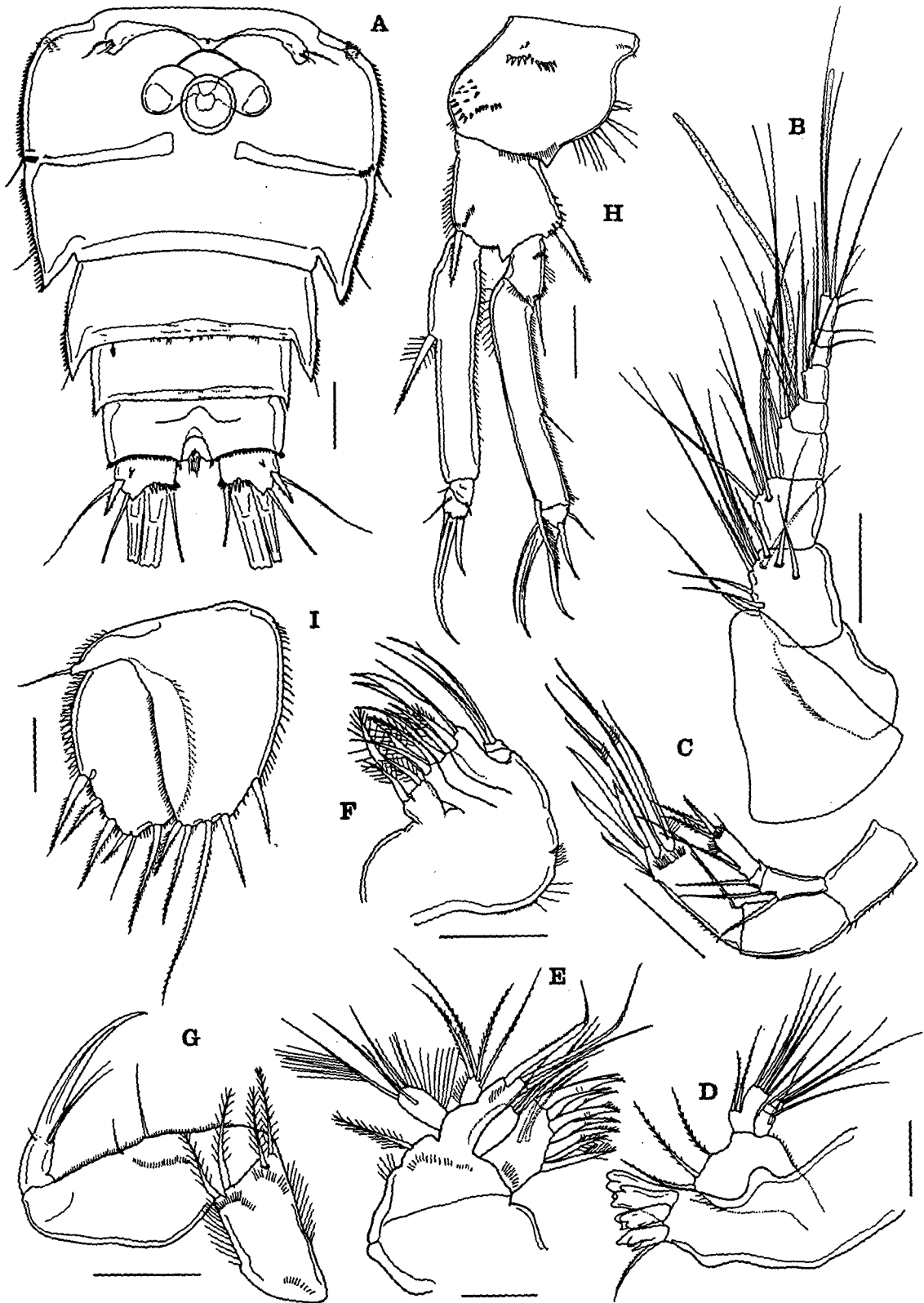


Fig. 6. *Ambunguipes rufocincta* (Brady), female: A, urosome, ventral; B, rostrum and antennule; C, antenna; D, mandible; E, maxillula; F, maxilla; G, maxilliped; H, leg 1; I, leg 5. (Scale bars=0.05 mm)



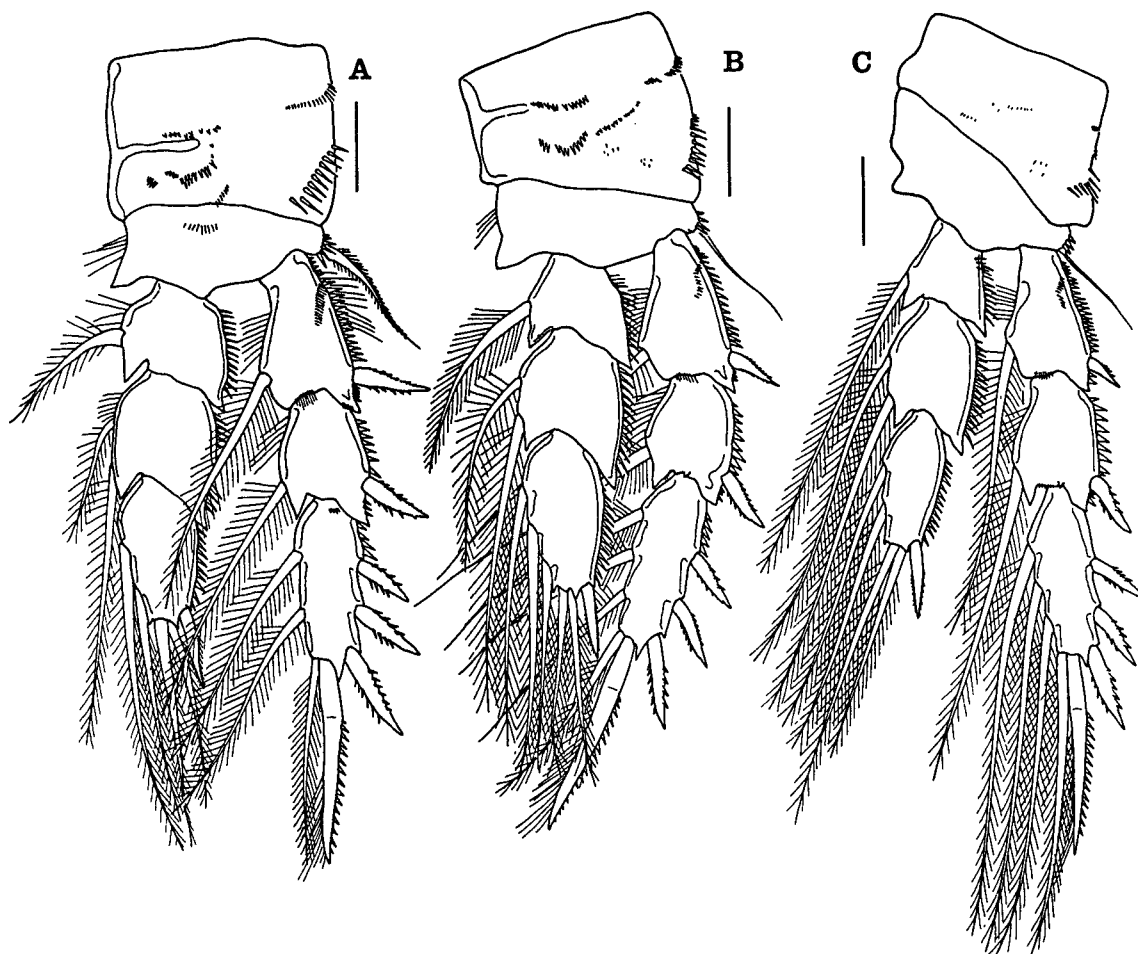


Fig. 7. *Ambunguipes rufocincta* (Brady), female: A-C, legs 2-4 (Scale bars=0.05 mm)

endopod of leg 2 in male ornamented with slender long hairs on outer margin (Fig. 5E), while absent in Ito's.

**Distribution.** Japan, Korea (East Sea, South Sea: from *Ulva pertusa* and several macroalgae).

Family Ambunguipedidae Huys, 1990  
Genus *Ambunguipes* Huys, 1990

3. *Ambunguipes rufocincta* (Brady, 1880) (Figs. 6~7)

*Thalestris rufocincta* Brady, 1880 (p. 125, pl. 57, figs. 1~9).

*Rhynchothalestris rufocincta*: Sars, 1905 (p. 120, pls. 73-74); Sewell, 1940 (p. 184); Vervoort, 1962 (p. 420, figs. 10~11); Yeatman, 1976 (p. 207, figs. 22~26).

**Materials examined.** 1♀, Samchonpo, Jan. 31, 1991; 1♀ (ovi.), Chukbyun, Uljin-gun, July 24, 1992; 1♀ (ovi.), Changsa, Youngil-gun, Nov. 22, 1993; 2♀, Changgigot, July 25, 1990; 1♀ (ovi.), Masan-ri, Pohang, March 23, 1997; 1♀ (ovi.), Masan-ri,

Pohang, May 25, 1997.

**Remarks.** This species had been recorded by the name of *Thalestris rufocincta* or *Rhynchothalestris rufocincta* from all over the world including Mediterranean, Black Sea, North Atlantic, Caribbean Sea, Bermuda, Indo-Pacific etc, until Huys (1990) redescribed this species as a new combination with genus *Ambunguipes* with the establishment of family Ambunguipedidae on the basis of the specimens from Port Phillip of Australia. Our specimens are well fitted with Huys's (1990) redescription except these facts: (1) ventral posterior margin of third abdominal segment with tiny hairs instead of spinules in Huys'; (2) first and second segments of antennule with subequal length, while first segment about two times longer than second one in Huys'; (3) basis of antenna with 2 tiny setules on the inner distal corner, while a small seta in Huys'.

**Distribution.** Cosmopolitan, Korea (East Sea, South Sea: from *Ulva pertusa* and several macroalgae).

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