

## LITTORAL CAPRELLIDS (CRUSTACEA: AMPHIPODA: CAPRELLIDEA) FROM PHILIPPINES, WITH THE DESCRIPTION OF A NEW SPECIES

José M. Guerra-García

Laboratorio de Biología Marina, Departamento de Fisiología y Zoología, Facultad de Biología, Universidad de Sevilla,  
Avda Reina Mercedes 6, 41012 Sevilla, Spain. E-mail: jmguerra@us.es

**ABSTRACT.** – Collections of littoral caprellids from Marinduque and Pamilacan Islands, Philippines, have been studied. The material contained three species: *Metaproto novaehollandiae* (Haswell, 1880), *Protogeton inflatus* Mayer, 1903 and *Deutella philippinensis* new species, which is described in the present paper. *Deutella philippinensis* new species is close to *D. margaritae* Guerra-García, 2002 and *Deutella mayeri* Stebbing, 1895, but constant differences in the mouthparts, gnathopods, pereopods 3 and 4 and male abdomen revealed that the specimens from Philippines belong to a new species. This is the first record of the genus *Deutella* for the Western Pacific.

**KEY WORDS.** – Caprellidea, Philippines, taxonomy, *Deutella philippinensis*, new species.

### INTRODUCTION

Caprellid amphipods are small peracarid crustaceans distributed along the world coasts. They usually live as epibionts on a variety of substrates from the littoral zone to a depth of 4790 m and many are commensal with other invertebrates such as echinoderms, hydroids, and bryozoans (Laubitz & Mills, 1972; Guerra-García, 2001).

Although the caprellids are very important as secondary and tertiary producers in marine ecosystems, they have been poorly studied on tropical areas of Indo-West Pacific. Recently, Takeuchi & Sagamoto (1998) illustrated the necessity for studies on the Caprellidea inhabiting this region. Laubitz (1991) mentioned that knowledge of the caprellid species in these regions remained sparse because of the small number of specimens available for analysis. This lack of studies contrasts with the many studies carried out along Japan in the north-western Pacific (Takeuchi, 1999).

The first studies of the caprellids from Philippines and nearby areas were conducted by Mayer (1903), who gave the best overview of the region in his monograph of the world Caprellidea. After this, Mayer (1904) and Sivaprakasam (1969, 1977) dealt with the caprellids from Sri Lanka. Laubitz (1991) recorded 17 species, many of which had not been reported since the original description, from the western Pacific based on specimens collected during French Oceanographic Expeditions to New Caledonia, Indonesia and Philippines. However, the samples were coming from deep stations (most of them more than 400 m deep) and no littoral species were investigated.

During a stay at the Australian Museum, the author studied some collections of shallow water caprellids from Marinduque Island, Panglao Island and Pamilacan Island, Philippines. Although the number of collected samples was considerably limited, a new species of *Deutella* was found, being the first record of the genus *Deutella* in the coasts of Western Pacific.

### MATERIAL AND METHODS

The specimens studied in the present paper were collected in shallow waters from Marinduque Island, Panglao Island and Pamilacan Islands (Fig. 1). In 1996, Marcopper Company in co-operation with the Australian Museum Business Services developed a sampling programme of the macroinvertebrates of the estuarine fauna from the West Coast of Marinduque Island to evaluate the impact of mining activities on coastal areas. Ten stations on two transects (A,B and C-J) were selected along the west coast. The samples collected in Panglao and Pamilacan Island (K,L) were part of a general sampling programme on marine invertebrates conducted by the Australian Museum. The samples from Marinduque Island were collected using a 0.06 m<sup>2</sup> van Veen grab and samples from Panglao and Pamilacan Islands were collected by SCUBA diving. All caprellids were fixed with a formalin-sea water solution and transferred to ethanol 70% after sorting. The specimens are deposited in the Australian Museum, Sydney (AM).

**List of stations** (see Fig. 1)

**A-B:** Boat, Northwest Coast of Marinduque Island (13°30'S, 121°30'E), Marcopper Project, Dec.1996, van Veen Grab. Depths: A(5.0m), B(7.5m).

**C-J:** Gasan, Southwest Coast of Marinduque Island (13°20'S, 121°30'E), Marcopper Project, Dec.1996, van Veen Grab. Depths: C(5.3m), D(5.4m), E(7.8m), F(8.3m), G(8.7m), H(22.7m), I(22.8m), J(25m).

**K:** Cebucan Beach, Panglao Island (9°38'N, 123°49'E), coll. W. F. Ponder, 28 Apr.1989, algal washings from grassy reef flat, 2 m depth.

**L:** Pamilacan Island, Bohol (9°30'N, 123°55'E), coll. I. Loch, 1 May.1989, rubble washings from fringing reef, 2 m depth.

**TAXONOMY**

**FAMILY PHTISICIDAE VASSILENKO, 1968**

***Metaproto novaehollandiae* (Haswell, 1880)**  
(Fig. 2)

*Proto novae-hollandiae* Haswell, 1880: 275-276, Pl. 2 fig. 3; Mayer, 1882: 26; 1890: 14-15; Stebbing, 1888: 1230-1232.  
*Metaproto novaehollandiae* – Mayer, 1903: 26-27, Pl. 1 figs. 11-12, Pl. 6 figs. 24-28, Pl. 9 figs 3, 50; Stebbing, 1910: 651-652; McCain & Steinberg, 1970: 56; Laubitz 1991: 103-104, Fig. 1.

**Material examined.** – 1 male, 1 female (L) (AM P61359).

**Remarks.** – The genus *Metaproto* can be easily distinguished from the remaining genera of the family Phtisicidae by the presence of only one pair of abdominal appendages. Although the specimens examined in the present study are in agreement with those described by Haswell (1880) and redescribed by

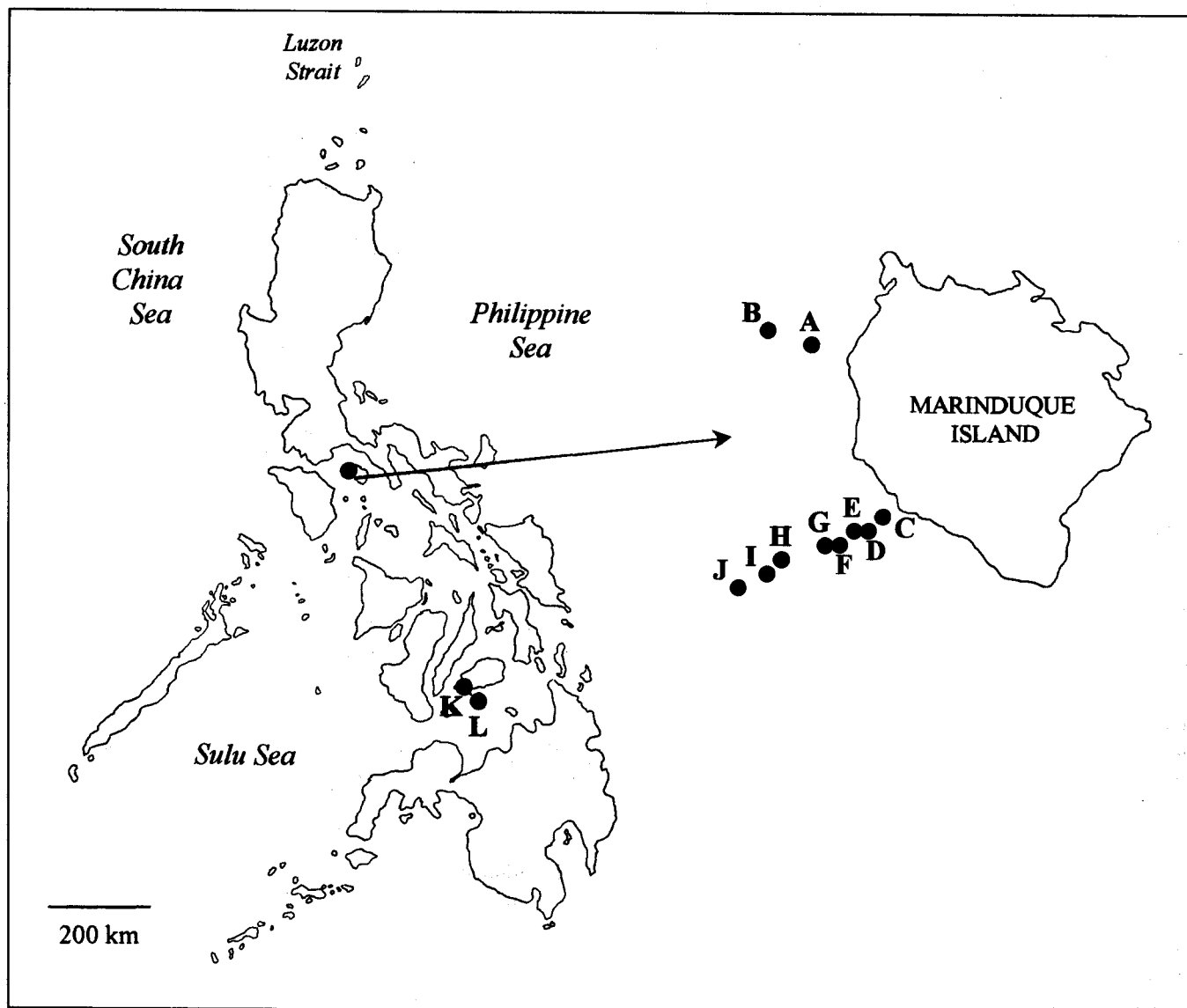


Fig. 1. Map of Philippines showing the sampling localities.

Mayer (1903) and Laubitz (1991), the type material of *M. novaehollandiae* is lost (Springthorpe & Lowry, 1994) and the original description of Haswell (1880) is too simple by the level of the modern taxonomy. Furthermore, the wide distribution of *M. novaehollandiae* from the temperate region of Australia to the tropical area of Indo-west Pacific is also under debate. However, *M. novaehollandiae*, is now being redescribed based on specimens collected from New South Wales, near the type locality (Takeuchi, in prep.). The present specimens from the Philippines are similar to those from New South Wales, but differ from specimens collected in Hong Kong (Guerra-García & Takeuchi, in prep.). The ecology of *Metaproto novaehollandiae* is still poorly known; this species has been found between 4-790 m. deep, living between antipatharians, echinoderms (Laubitz, 1991) and rubble corals (present study).

**Distribution.** – Type locality: Port Jackson, Australia (Haswell, 1880). Other records: Banda Sea, Indonesia, South Africa (McCain & Steinberg, 1970), New Caledonia and Philippines (Laubitz, 1991).

***Protogeton inflatus* Mayer, 1903**

(Fig. 3)

*Protogeton inflatus* Mayer, 1903: 28-29, Pl. 1 fig. 13, Pl. 6 figs. 29-32, Pl. 9 figs. 11, 35, 51; Utinomi, 1947: 69.

**Material examined.** – 1 male (F) (AM P61361); 1 male (I) (AM P61362); 2 females (J) (AM P61363).

**Remarks.** – The original description of this species by Mayer (1903) is in insufficient detail, and a redescription is clearly needed. However, as a redescription of the genus and species

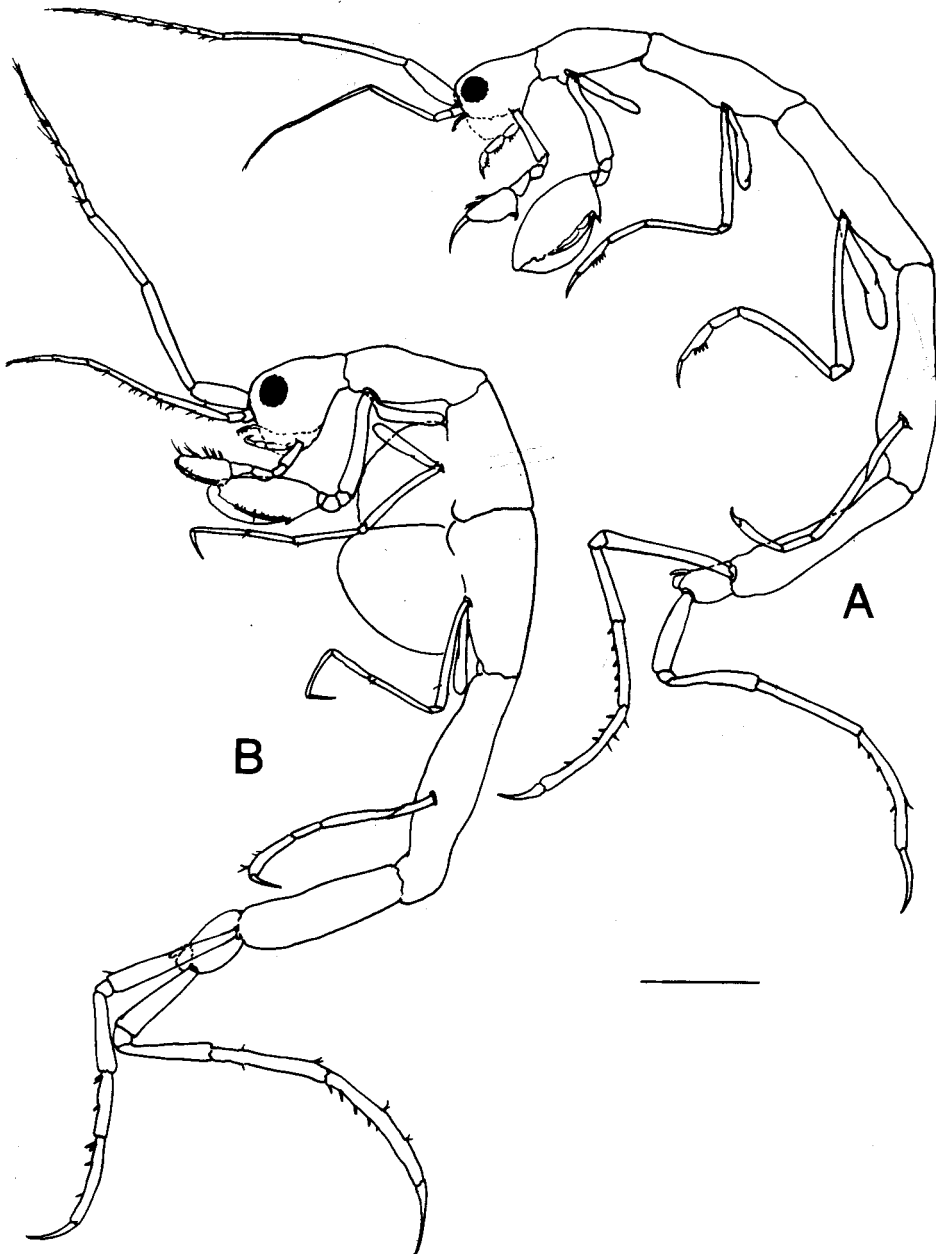


Fig. 2. *Metaproto novaehollandiae* (Haswell, 1880). Lateral view. A, male; B, female. Scale bar: 1 mm.

is already being prepared in a separate revisionary work of the family Phtisicidae to be published later (Guerra-García, in prep.), I have included in the present study only the lateral view of *P. inflatus*, which is very characteristic and useful for quick identification.

The genus *Protogeton* is characterised by the absence of abdominal appendages. This character is also present in the genus *Pseudoproto* Mayer, 1903, inside the Phtisicidae. Nevertheless the feature of the pereopods 3 and 4 in males of *Protogeton inflatus* is unique inside the Caprellidea; the carpus, propodus and dactylus are curved, and with lateral expansions. Furthermore, the mandibular palp is reduced to one article in *Protogeton* while it is normally 3-articulate in *Pseudoproto*. The specimens studied are in complete agreement with the type material described by Mayer (1903). Although the material is considerably limited, it seems that

this species avoids the shallowest stations, preferring depths more than 20 meters.

**Distribution.** – Type locality: Dongala, Celebes, Indonesia (McCain & Steinberg, 1970). Other records: Tanabe Bay, Japan (McCain & Steinberg, 1970). This study represents the first record of the species for the Philippines.

#### FAMILY CAPRELLIDAE LEACH, 1814

##### *Deutella philippinensis*, new species (Figs. 4-8)

**Material examined.** – Holotype – male (AM P61370), Boat, Philippines, Dec.1996, 5.0 m. deep (A), van Veen Grab.

Allotype – female (AM P61371), Gasan, Philippines, Dec.1996, 7.8 m. deep (E), van Veen Grab.

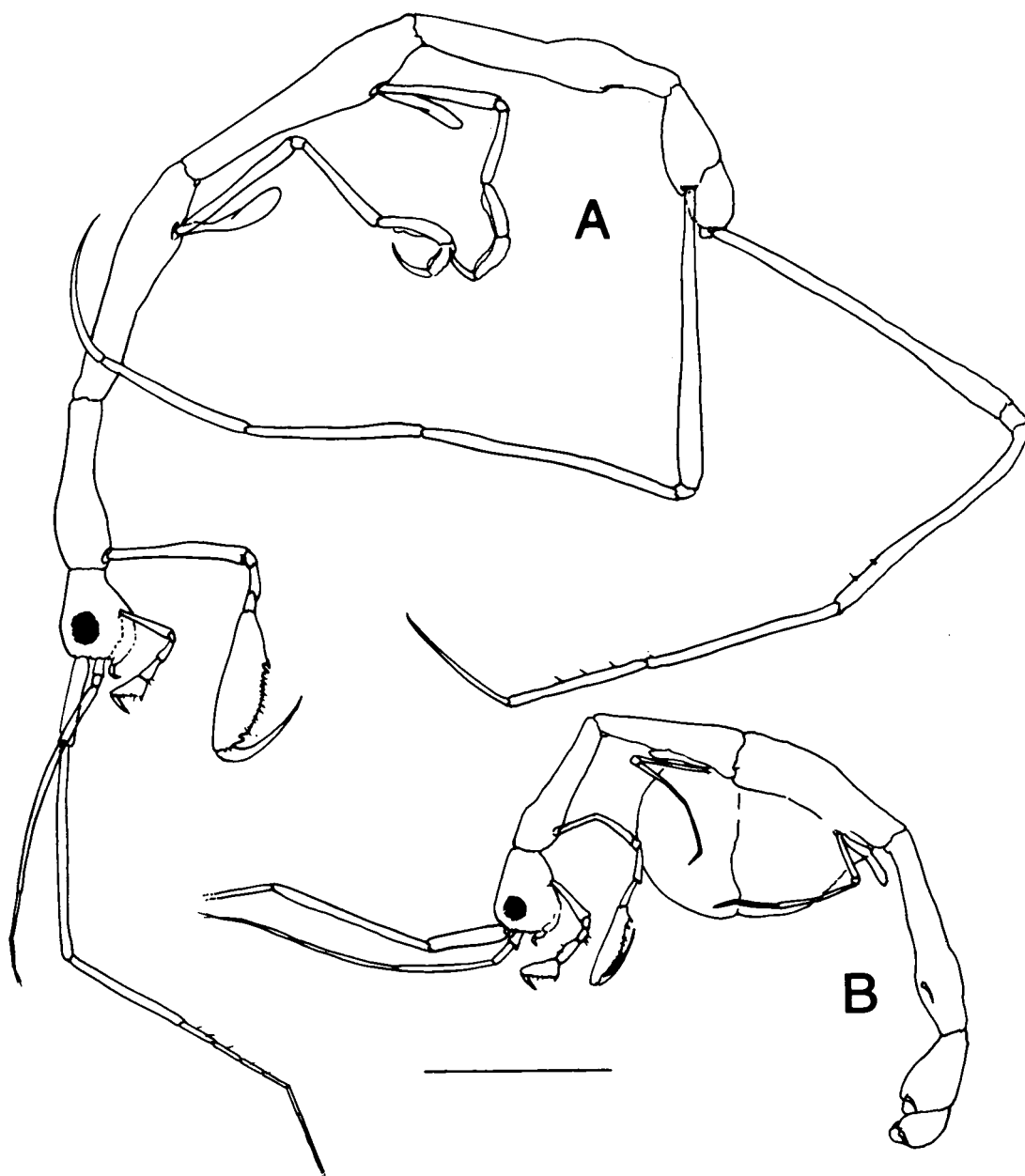


Fig. 3. *Protogeton inflatus* Mayer, 1903. Lateral view. A, male; B, female. Scale bar: 1 mm.

Others – 1 female (AM P61364) (B); 2 males (AM P61368) (C); 2 males, 2 females (AM P61366) (D); 1 female (AM P61367) (G); 1 male (AM P61365) (H).

**Distribution.** – Type locality: Boat, Northwest Coast of Marinduque Island (13°30'S, 121°30'E), 5.0–7.5 m deep. Other records: Gasan, Southwest Coast of Marinduque Island, 5.3–22.7 m deep. (13°20'S, 121°30'E).

**Etymology.** – Named *philippinensis* alluding to Philippines, the place where the species was found.

**Description.** – *Holotype male*

*Body length.* 6.1 mm.

*Lateral view* (Fig. 4A). Body dorsally smooth. Head rounded. Pereonite 1 fused with head, suture not present; anterolateral margin of pereonite 2 with a triangular projection; pereonites 2–5 increasing in length; pereonite 7 the shortest.

*Gills* (Fig. 4A). Elongate, length about 3.5 times width.

*Mouthparts.* Upper lip (Fig. 5B) symmetrically bilobed, pubescent apically. Mandibles (Figs. 6A,B) with three-articulate palp; distal article of palp with a setal formula 1-1-1 and three knobs; second article provided with three

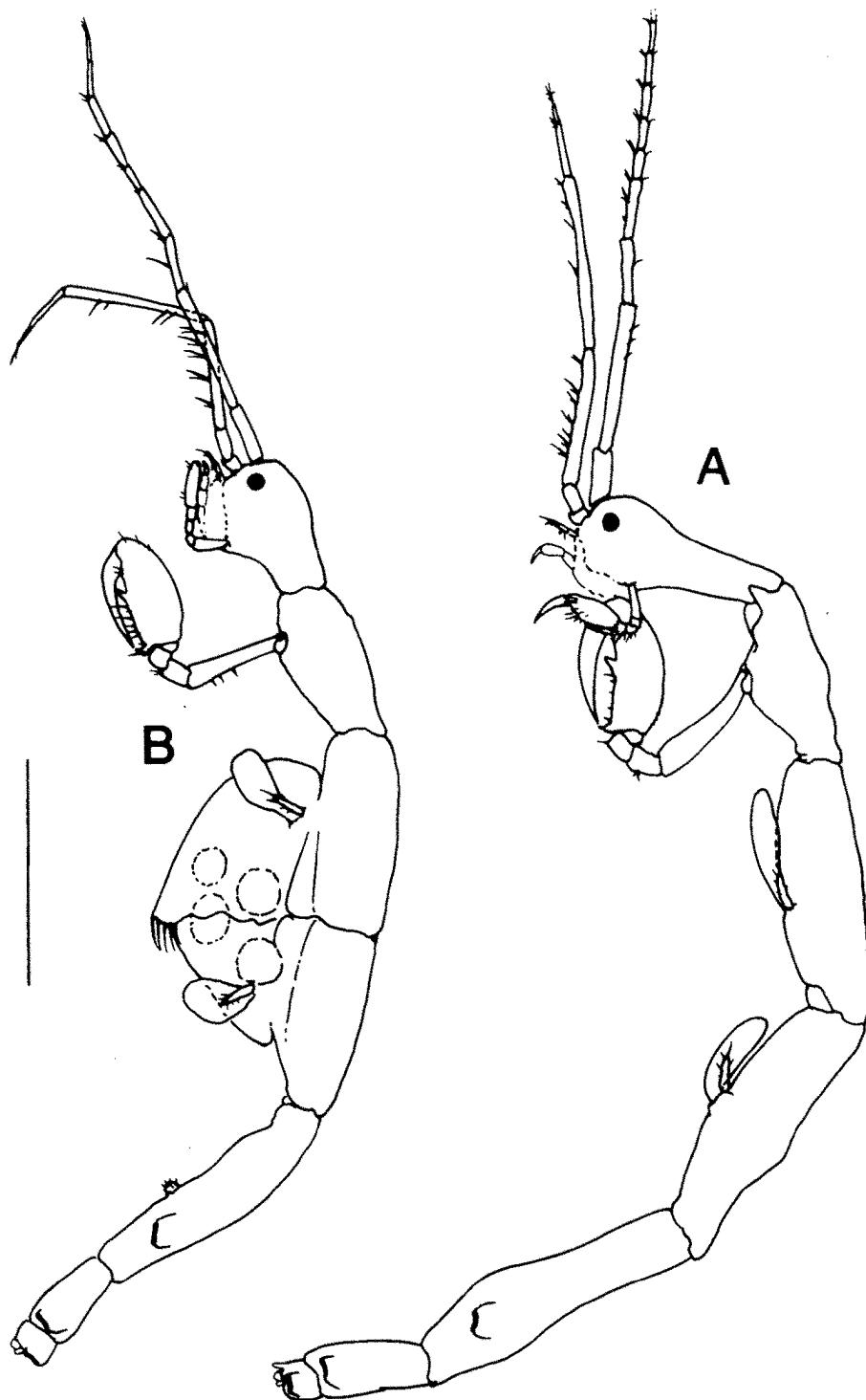


Fig. 4. *Deutella philippinensis*, new species. Lateral view. A, male; B, female. Scale bar: 1 mm.

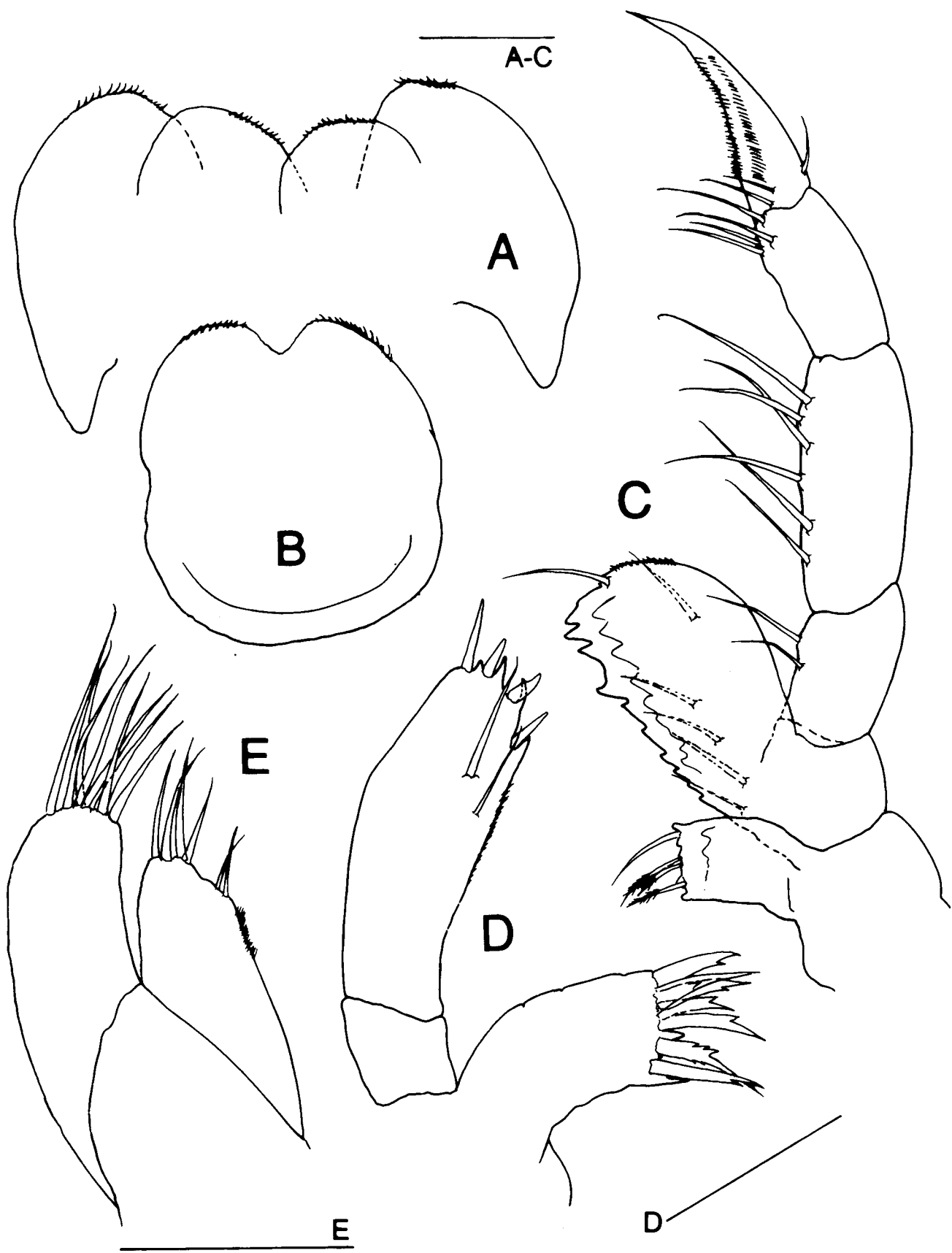


Fig. 5. *Deutella philippinensis*, new species. Male. A, lower lip; B, upper lip; C, maxilliped; D, maxilla 1; E, maxilla 2. Scale bars: 0.05 mm.

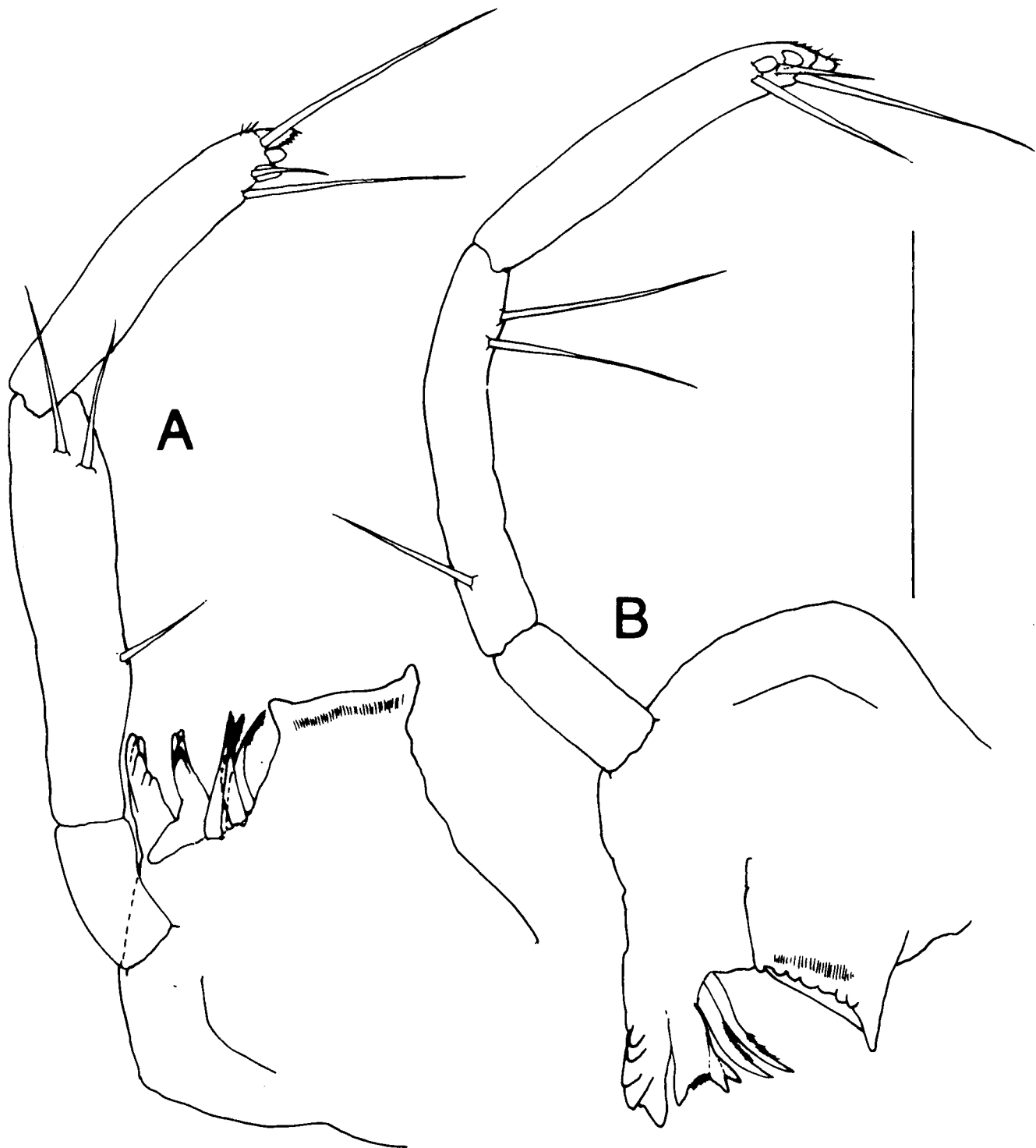


Fig. 6. *Deutella philippinensis*, new species. Male. A, left mandible; B, right mandible. Scale bar: 0.1 mm.

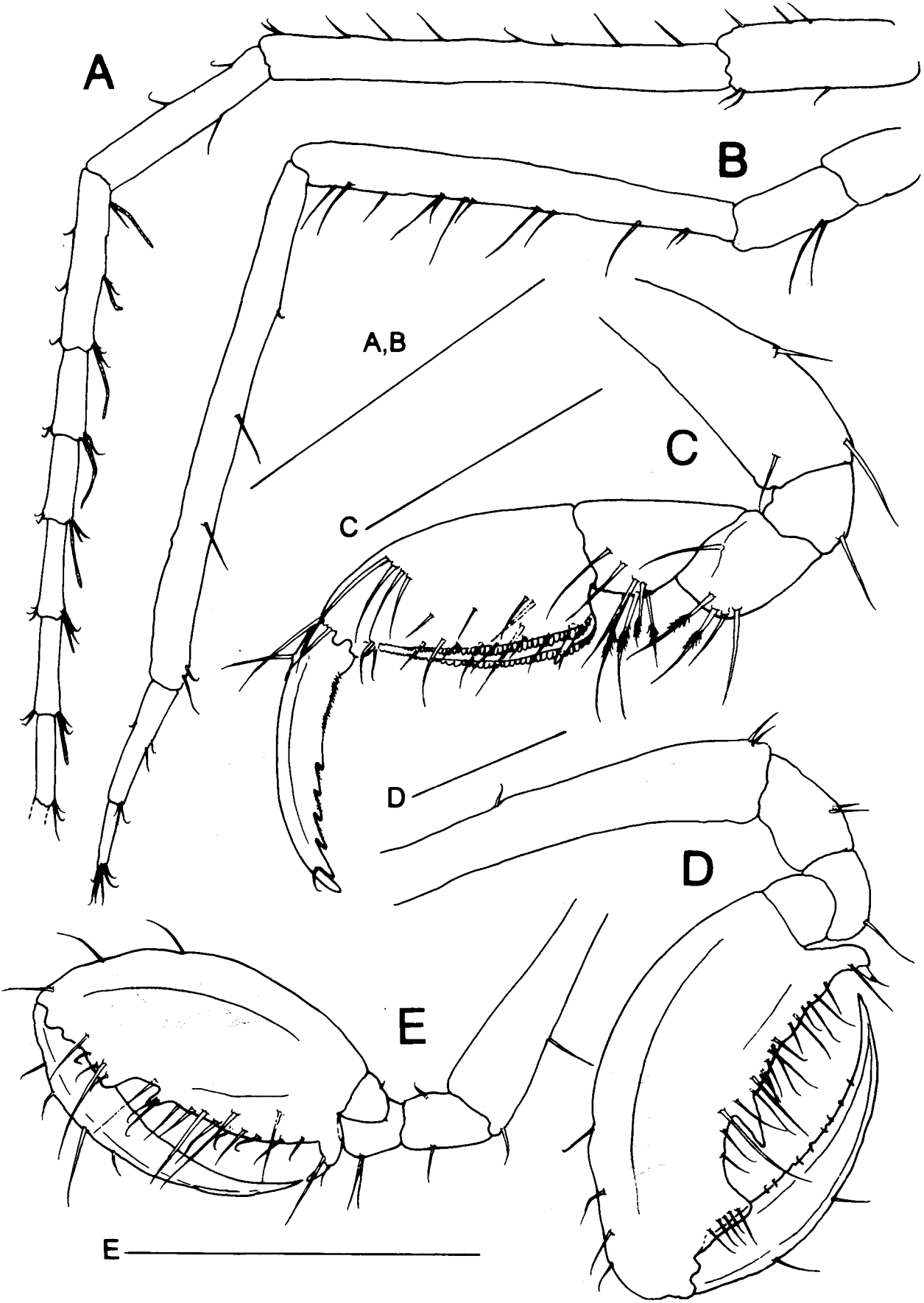


Fig. 7. *Deutella philippinensis*, new species. A-D, male. A, antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2. E, female gnathopod 2. Scale bars: A,B,D,E: 0.5 mm; C: 0.2 mm.



simple setae; mandibular molar robust; left mandible (Fig. 6A) with incisor five-toothed, lacinia mobilis five-toothed followed by three plumose setae; incisor of right mandible (Fig. 6B) five-toothed, lacinia mobilis serrate, with three teeth distally; molar flake absent. Lower lip (Fig. 5A) with inner lobes well-demarcated; inner and outer lobes provided with setulae on apical end. Maxilla 1 (Fig. 5D) outer lobe with seven robust setae serrate; distal article of the palp with four robust setae and four teeth distally, and two setae medially. Maxilla 2 (Fig. 5E) inner lobe rectangular, carrying six setae distally and a row of small setulae laterally; outer lobe, a little larger than inner lobe, with eight apical setae. Maxilliped (Fig. 5C) inner plate rectangular with three plumose setae and one simple seta; outer plate about 3.5 times as large as inner plate, with six setae; palp four-articulate, dactylus without two rows of setulae.

**Antennae.** Antenna 1 (Fig. 7A) about the half of body length; flagellum broken in the holotype (six-seven articulate in the remaining males examined). Antenna 2 (Fig. 7B) without

swimming setae; flagellum two-articulate.

**Gnathopods.** Gnathopod 1 (Fig. 7C) basis as long as ischium, merus and carpus combined; propodus elongate, length about two times width, palm with a proximal grasping spine and two denticulate margins; dactylus serrate on the posterior half. Gnathopod 2 (Fig. 7D) inserted on the half of pereonite 2; basis about 0.7 times the length of pereonite 2; ischium rectangular; merus rounded; carpus short and rectangular; propodus elongate, about 1.2 times as long as the basis; palm with a proximal projection elongate and provided with one grasping spine and two more triangular projections in the middle and distally, respectively; dactylus long, with setulae on ventral margin.

**Pereopods.** Pereopods 3 and 4 subequal, one-articulate, length about one-third of gills, with seven setae. Pereopods 5-7 missing.

**Penes** (Fig. 8C) large, situated laterally, length about two times width.

**Abdomen** (Fig. 8D) with a pair of appendages, a pair of

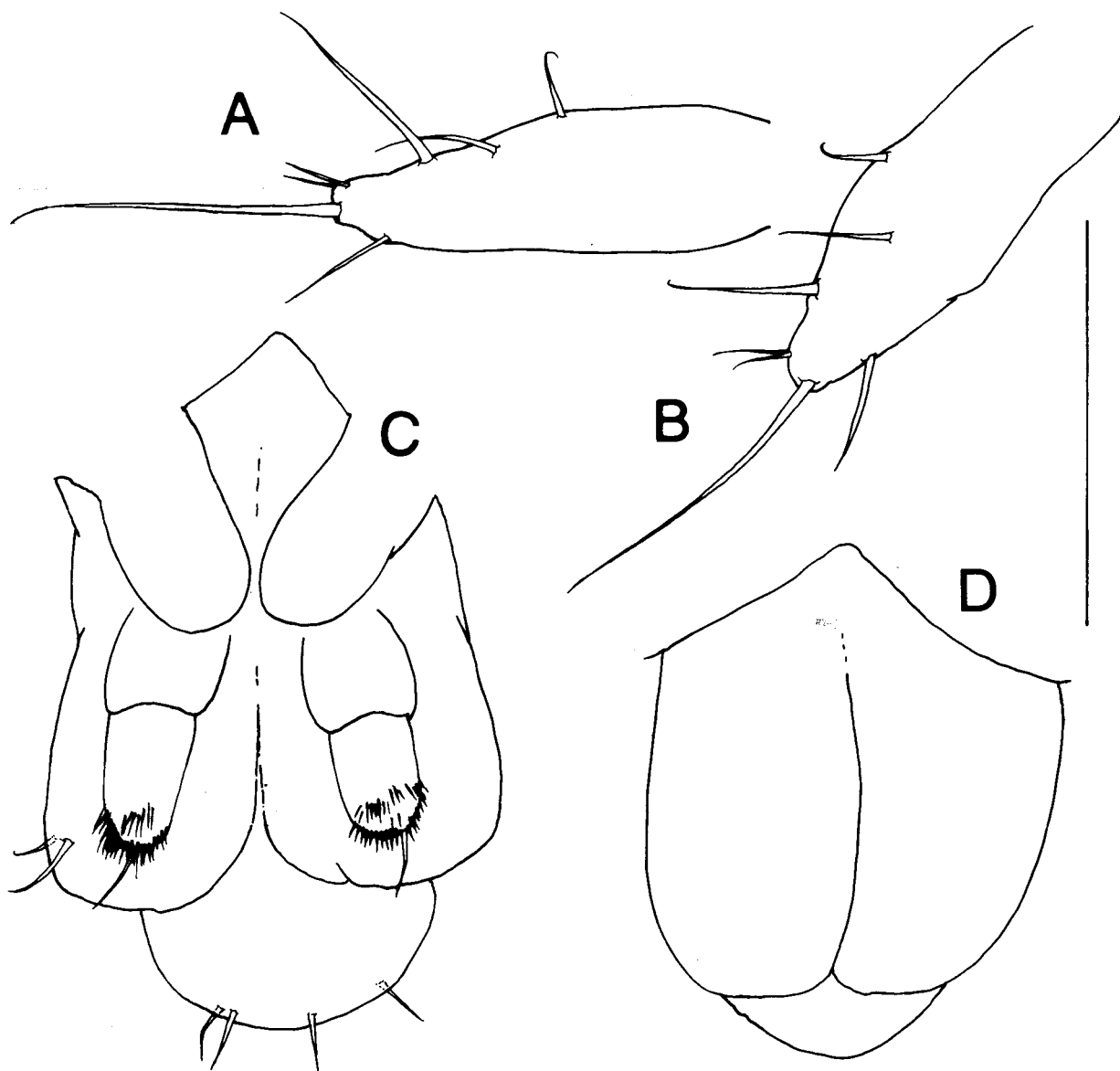


Fig. 8. *Deutella philippinensis*, new species. A-C, male. A, pereopod 3; B, pereopod 4; C, abdomen (ventral view); D, female abdomen (ventral view). Scale bar: 0.1 mm.

lateral lobes and a single dorsal lobe. Appendages two-articulate; distal article two times as long as proximal one, provided with small setulae and a seta distally.

#### Allotype female

Body length 4.6 mm. The anterolateral projection, present in holotype male on pereonite 2, extremely reduced, almost absent. Flagellum of antenna 1 with six articles (Fig. 4B). Gnathopod 2 inserted on the anterior part of pereonite 2; propodus of gnathopod 2 wider than in male, length about two times width (Fig. 7E). Oostegites on pereonite 3 setose, on pereonite 4 not setose (Fig. 4B). Abdomen without appendages (Fig. 8D).

**Remarks.** – This is the first record of the genus *Deutella* from the tropical area of Indo-west Pacific. The genus *Deutella* was established by Mayer (1890) and has been recently reviewed by Guerra-García (2002). Eight species of this genus had been described so far: *Deutella aspiducha* Gable & Lazo-Wasem, 1987, *D. californica* Mayer, 1890, *D. incerta* (Mayer, 1903), *D. margaritae* Guerra-García, 2002, *D. mayeri* Stebbing, 1895, *D. schieckei* Cavedini, 1981, *Deutella vema* (McCain & Gray, 1971) and *D. venenosa* Mayer, 1890. *Deutella aspiducha*, *D. incerta*, *D. margaritae* and *D. mayeri* are distributed in the tropical Western Atlantic;

*D. californica* has been recorded along the North Pacific coast of North America; *D. venenosa* has been collected from Central Chile, *D. vema* is known from Subantarctic waters of South America and *D. schieckei* was described from Mediterranean (Fig. 9). The presence of the genus *Deutella* also in the Western Pacific is confirmed by the present work. However, so far, no *Deutella* species has been found in the Indian Ocean (Guerra-García, 2002). But, probably the genus is cosmopolitan and the absence of records for Indian Ocean is due to the lack of caprellid studies in this region (McCain & Steinberg, 1970).

*Deutella philippinensis* new species is close to *D. margaritae* and *D. mayeri* in lacking dorsal projections on head to pereonite 7. However, constant differences in the mouthparts, gnathopods, pereopods 3 and 4 and male abdomen (see Table 1) revealed that the specimens of *Deutella* from Philippines belong to a new species, described herein as *Deutella philippinensis*. The new species has been assigned to the genus *Deutella* mainly on the basis of the structure and proportions of the antennae, the mouthparts morphology, the reduced pereopods 3 and 4, the structure of the male abdomen having a pair of appendages and the general feature of body. In connection with the intraspecific variation among the specimens of *D. philippinensis* examined, the flagellum of

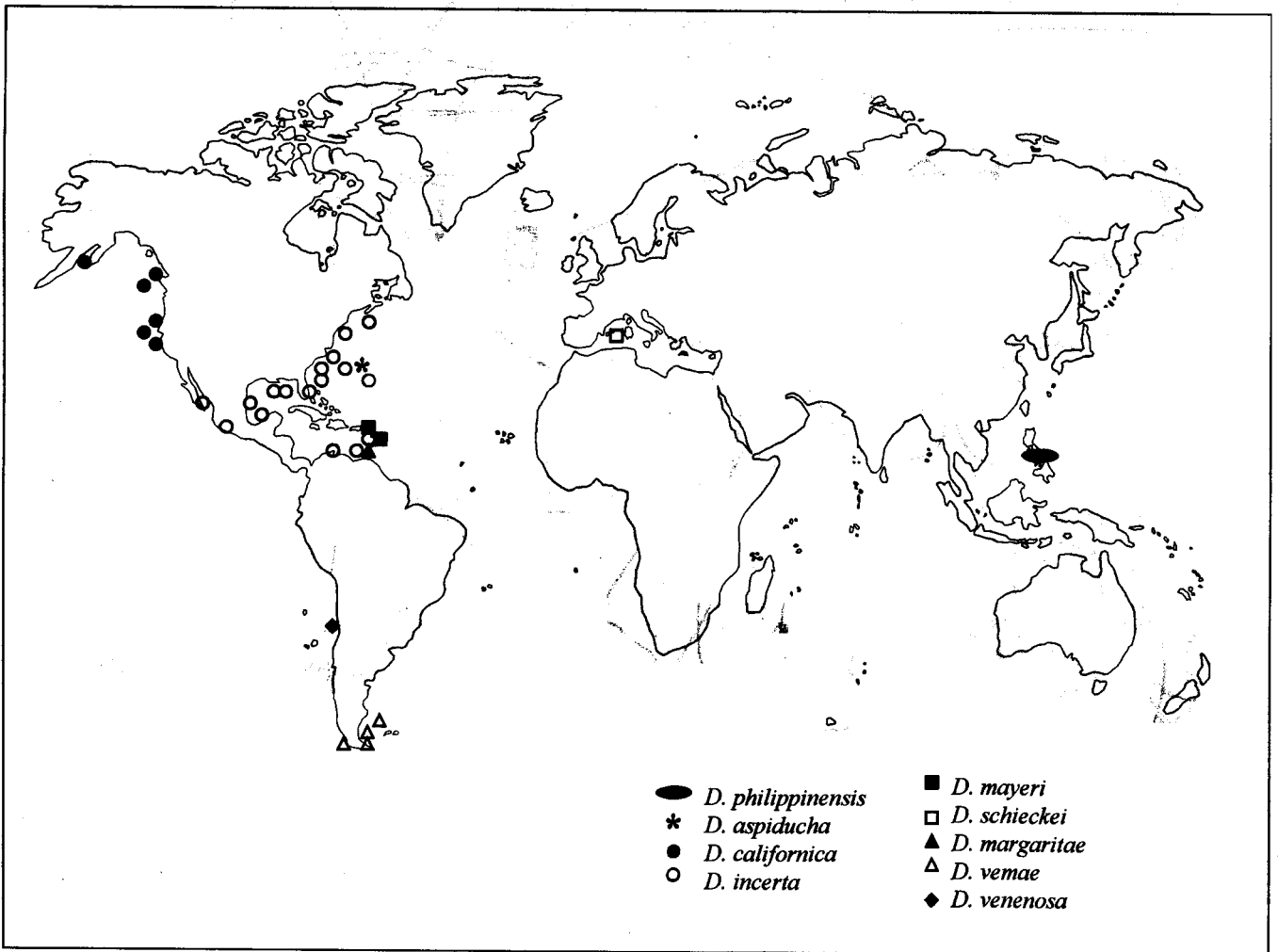


Fig. 9. Biogeographical distribution of the *Deutella* species along the world.

Table 1. Detailed comparison among the species of *Deutella* (Modified from Guerra-García, 2002).

|                                                         |                                                  | <i>D. philippinensis</i> , new species | <i>D. aspiducha</i> | <i>D. californica</i> | <i>D. incerta</i> | <i>D. margaritae</i> | <i>D. mayeri</i> | <i>D. schieckei</i> | <i>D. vemae</i> | <i>D. venenosa</i> |
|---------------------------------------------------------|--------------------------------------------------|----------------------------------------|---------------------|-----------------------|-------------------|----------------------|------------------|---------------------|-----------------|--------------------|
| Body length (mm)                                        | Male                                             | 6,1                                    | 4,8                 | 5,5                   | 9                 | 7,8                  | 4                | 4,5                 | 13,5            | 5,7                |
|                                                         | Female                                           | 4,6                                    | 4,2                 | 3,8                   | 8                 | 6,2                  | 3                | 3,5                 | 12              | 4,8                |
| Dorsal projections                                      |                                                  | Absent                                 | Present             | Present               | Present           | Absent               | Absent           | Absent              | Present         | Present            |
| Antenna 1 flagellar articles                            | Male                                             | 6-7                                    | 6-7                 | 12                    | 10-11             | 14                   | 6-7              | 6-8                 | 11              | 11                 |
|                                                         | Female                                           | 6-7                                    | 4                   | 12                    | 10                | 10                   | 6-7              | 6                   | 9               | 7                  |
| Antenna 2 flagellar articles                            |                                                  | 2                                      | 2                   | 2                     | 2                 | 2                    | 2                | 2                   | 2               | 2                  |
| Mandibles                                               | Knobs on distal article of palp                  | Present                                | Present             | Absent                | Present           | Present              | Absent           | Absent              | Absent          | Absent             |
|                                                         | Setal formula                                    | 1-x-1, x=1                             | 1-x-1, x=5          | 1-x-1, x=3-5          | 1-x-1, x=3-10     | 1-x-1, x=9           | 1 or 2 setae     | 2 setae             | 1-x-1, x=11     | 1-x-1, x=4-5       |
|                                                         | Left and right incisor                           | 5-toothed                              | 6-toothed           | 5-toothed             | 5-toothed         | 5-toothed            | 5-toothed        | 5-toothed           | 5-toothed       | 5-toothed          |
|                                                         | Left lacinia mobilis                             | 5-toothed                              | Serrate             | 5-toothed             | 5-toothed         | 4-toothed            | 5-toothed        | 5-toothed           | 5-toothed       | 5-toothed          |
|                                                         | Righth lacinia mobilis                           | Serrate-4-toothed                      | Serrate             | 5-toothed             | Serrate           | Serrate              | Serrate          | Serrate             | Serrate         | Serrate            |
|                                                         | Molar flake                                      | Present                                | Absent              | Absent                | Absent            | Present              | Absent           | Absent              | Absent          | Present            |
| Maxilla 1                                               | Distal spines of outer lobe                      | 7                                      | 5                   | 6                     | 5-6               | 5                    | 4-5              | 5                   | 6               | 6                  |
|                                                         | Distal spines of palp                            | 4                                      | 3                   | 3                     | 4                 | 4                    | 3-4              | 4                   | 4               | 5                  |
| Maxilla 2                                               | Setae of outer lobe                              | 8                                      | 4                   | 4                     | 5-7               | 3                    | 5-6              | 4                   | 5               | 4                  |
|                                                         | Setae of inner lobe                              | 6                                      | 3                   | 5                     | 4-5               | 4                    | 4-5              | 4                   | 5               | 5                  |
| Maxilliped                                              | Inner plate                                      | 1 tooth                                | no tooth            | no tooth              | no tooth          | 1 tooth              | no tooth         | 1 tooth             | no tooth        | 1 tooth            |
|                                                         |                                                  | 4 setae                                | 2 setae             | 3 setae               | 4 setae           | 4 setae              | 3-4 setae        | 3-4 setae           | 3 setae         | 3 setae            |
|                                                         | Outer plate                                      | 6 setae                                | 4-5 setae           | 5-6 setae             | 5-7 setae         | 4-5 setae            | 12 setae         | 7 setae             | 4-5 setae       | 5 setae            |
|                                                         | Distal projection on penultimate article of palp | Absent                                 | Absent              | Present               | Absent            | Absent               | Absent           | Present             | Absent          | Present            |
| Gnathopod 1 grasping spines                             |                                                  | 1                                      | 2                   | 1                     | 2                 | 2                    | 1                | 1                   | 2               | 1                  |
| Proximal projection of the propodus of gnathopod 2 male |                                                  | Triangular                             | Rectangular         | Rectangular           | Rectangular       | Rectangular          | Triangular       | Rectangular         | Rectangular     | Rectangular        |
| Pereopods 3 and 4                                       |                                                  | 1-articulate                           | 2-articulate        | 2-articulate          | 2-articulate      | 2-articulate         | 2-articulate     | 2-articulate        | 2-articulate    | 1 or 2-articulate  |
| Pereopods 5                                             |                                                  | -                                      | Reduced             | Normal                | Normal            | Normal               | Normal           | Normal              | Normal          | Normal             |
| Male abdominal appendages                               |                                                  | 2-articulate                           | 1-articulate        | 1-articulate          | 1-articulate      | 2-articulate         | 1-articulate     | 1-articulate        | 1-articulate    | 1-articulate       |

antenna 1 is six-seven articulate in males and females. The anterior projection on pereonite 2 is present in all males, being extremely reduced in all females. The setal formula in the mandibles was constantly 1-1-1 and the number of setae on maxillae was also constant. The right lacinia mobilis varied from serrate to four-toothed, and the molar flake (although absent in the holotype) was present in some specimens. Frequently, the molar flake can be lost during preparations of the mouthparts (Mori, 1996; Guerra-García, pers. obs.). So, only by dissecting several specimens the presence of a molar flake can be determined. Therefore, this character should not be considered as definitive taxonomically, unless many specimens are carefully dissected and compared. The pereopods 5-7 were missing in all specimens examined of *Deutella philippinensis* including the type material. These pereopods in the genus *Deutella* have no great taxonomic value. Nevertheless, in most of the genus belonging to the family Phtisicidae the morphology of these pereopods, specially the fifth, is taxonomically informative and descriptions based on specimens lacking these pereopods should be avoided in the updated taxonomy (Takeuchi, 1993, Takeuchi & Sawamoto, 1998).

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