Two new species of *Deutella* Mayer, 1890 (Crustacea: Amphipoda: Pariambidae) collected by the R.V. “Anton Bruun” during the International Indian Ocean Expedition 1963-1964

JOSÉ M. GUERRA-GARCÍA
Laboratorio de Biología Marina, Departamento Fisiología y Zoología, Facultad de Biología, Universidad de Sevilla, Avenida Reina Mercedes 6, 41012 Sevilla, Spain
jmguerra@us.es

Abstract

Two new caprellids, *Deutella antonbruuni* sp. nov. and *D. indica* sp. nov., are described from material collected by the vessel “Anton Bruun” during the International Indian Ocean Expedition 1963-1964. Complete descriptions and illustrations of the new species are provided and are compared to other *Deutella* species. A distribution map is included. *Deutella indica* possesses a unique seta formula for the genus *Deutella*, 2-x-1 instead of 1-x-1, adding to the diagnosis of the genus *Deutella* and the family Pariambidae. This study represents the first record of the genus *Deutella* in the Indian Ocean.

Key words: Amphipoda, Caprellidea, *Deutella*, taxonomy, new species

Introduction

The genus *Deutella* Mayer, 1890, recently revised by Guerra-García (in press.), included nine previously described species. They are *Deutella aspiducha* Gable & Lazo Wasem, 1987; *Deutella californica* Mayer, 1890; *Deutella incerta* (Mayer, 1903); *Deutella margaritae* Guerra-García, in press (a); *Deutella mayeri* Stebbing, 1895; *Deutella philippinensis* Guerra-García, in press (b); *Deutella schieckei* Cavedini, 1981; *Deutella vemae* (McCain & Gray, 1971) and *Deutella venenosa* Mayer, 1890.

Species in the genus *Deutella* are widely distributed along the latitudinal gradient from Alaska in the Northern Hemisphere to Subantarctic waters in the Southern Hemisphere (Guerra-García, in press (a)). However, the species are quite restricted along the longitudinal gradient; apart from *D. schieckei*, which occurs in Mediterranean Sea, and *D. philippinensis*, found in the Western Pacific, the remaining species are limited to American...
coasts (Pacific or Atlantic) and no Deutella species had been found in the Indian Ocean before this study.

During a stay at the National Museum of Natural History, the author studied the caprellid material collected during the cruise 1963-1964 on board the “Anton Bruun” of the International Indian Ocean Expedition. Renamed “Anton Bruun”, in honor of the noted Danish marine biologist, the vessel was chartered to Woods Hole Oceanographic Institution (W.H.O.I) for the International Indian Ocean Expedition and made ten scientific cruises to the Indian Ocean, collecting bottom, midwater, and surface samples. A multinational assemblage of scientists, from the United States, India, Thailand, Brazil and Pakistan worked on board the ship during the cruises.

The Caprellidea collected by these cruises were not abundant and of the few collected, most were in poor condition. However, further examination revealed the presence of two new species of Deutella, representing the first record of the genus in the Indian Ocean. The new species, Deutella antonbruuni sp. nov. and Deutella indica sp. nov. are described and figured here. Type material is deposited in the National Museum of Natural History, Washington D.C. (USNM).

Results

Family Pariambidae Laubitz, 1993 emended

Diagnosis. Antenna 2 flagellum 2-articulate. Mandible molar present, palp 3-articulate; setal formula 1-x-1, 2-x-1 or one apical setae incisor 5-toothed; left lacinia mobilis 5-toothed; right lacinia serrate or broadly three-toothed. Lower lip with inner lobes well demarcated. Maxilla 1 with 6 spiniform setae on outer plate. Maxilliped outer plate larger than inner; inner plate truncate with few apical setae. Gnathopod 1 propodus triangular to slender. Gills on pereonite 3 and 4. Pereopod 3 and 4 greatly reduced; pereopod 5 weaker than 6 and 7.

Genus Deutella Mayer, 1890 emended

Diagnosis. Antenna 2 flagellum with 2 articles, swimming setae absent. Mandibular palp 3-articulate; setal formula for distal article 1-x-1, 2-x-1 or 1 setae; molar present. Outer plate of maxilliped longer than inner lobe. Pereopod 5 with six articles. Male abdomen with pair of appendages and pair of setose lobes.

Type species: Deutella californica Mayer, 1890.
Checklist of *Deutella* species

*Deutella aspiducha* Gable & Lazo-Wasem, 1987


*Deutella californica* Mayer, 1890


*Deutella incerta* (Mayer, 1903)


*Deutella margaritae* Guerra-García, in press (a)

*Deutella margaritae* Guerra-García, in press (a)

*Deutella mayeri* Stebbing, 1895


*Deutella philippinensis* Guerra-García in press (b)

*Deutella philippinensis* Guerra-García, in press (b).

*Deutella schieckei* Cavedini, 1981


*Deutella vemae* (McCain & Gray, 1971)

*Deutella vemae* McCain & Gray, 1971: 123.

*Deutella venenosa* Mayer, 1890


*Deutella antonbruuni, sp. nov.* (Figs. 1-4)

**Type material:** Holotype: male USNM 1005297; Allotype: female USNM 1005298; Paratypes: 1 premature female, 3 juveniles (USNM 1005299). Holotype, allotype and paratypes collected with Agassiz Trawl, station 391J, 29º21’S, 31º35’E, 57 meters deep, 9.9.1964.

**Etymology.** The type material of the species was collected on board the vessel “Anton Bruun” during the International Ocean Expedition. The species is named after Anton Bruun, in honor to the noted Danish marine biologist.
FIGURE 1. Deutella antonbruuni sp. nov. Lateral view. A, male; B, female. Scale bar: 1 mm.

Description

Holotype male

Body length. 4.5 mm.

Lateral view (Fig. 1A). Body dorsally smooth (Fig. 3A). Head rounded. Pereonite 1
fused with head, suture present; pereonites 3 and 4 subequal with pleura well-developed (Fig. 1A, 3A); pereonite 5 the longest; pereonite 7 the shortest. 

*Gills* (Fig. 1A). Elongate, length about 3 times width.

**FIGURE 2.** Deutella antonbruuni sp. nov. Male. A, upper lip; B, lower lip; C, maxilliped; D, left mandible; E, right mandible; F, maxilla 1; G, maxilla 2. Scale bars: 0.05 mm.
Mouthparts. Upper lip (Fig. 2A) symmetrically bilobed, smooth apically. Mandibles (Fig. 2D,E) with 3-articulate palp; distal article of palp with a setal formula 1-2-1; second article provided with 2 simple setae; mandibular molar robust; left mandible (Fig. 2D) with incisor and lacinia mobilis 5-toothed followed by three plumose setae; incisor and lacinia mobilis of right mandible (Fig. 2E) 6-toothed, followed by 2 plumose setae; molar flake present, rectangular and setose distally. Lower lip (Fig. 2B) with well-demarcated inner lobes; inner and outer lobes provided with setulae on apical margin. Maxilla 1 (Fig. 2F) outer lobe with 6 robust setae; distal article of the palp with 5 robust setae and 4 teeth distally, and 3 setae medially. Maxilla 2 (Fig. 2G) inner lobe rectangular with 6 setae distally; outer lobe slightly larger than inner lobe, with 6 apical setae. Maxilliped (Fig. 2C) inner plate rectangular with 4 plumose setae and 1 robust and short seta (like a “tooth”); outer plate about 2.5 times as large as inner plate, with 6 setae; palp 4-articulate, penultimate article of the palp with a distal projection, dactylus without 2 rows of setulae.

Antennae. Antenna 1 (Fig. 3C) about 2/5 of body length; flagellum 7-articulate. Antenna 2 (Fig. 3D) with short setae (no swimming setae); basal article of the peduncle with a distal projection; flagellum 2-articulate.

Gnathopods. Gnathopod 1 (Fig. 3E) basis as long as ischium, merus and carpus combined; propodus length about 1.5 times width, palm with a proximal grasping spine and denticulate margin; dactylus serrate. Gnathopod 2 (Fig. 3F) inserted on the anterior half of pereonite 2; basis as long as pereonite 2; ischium rectangular; merus triangular; carpus short and rectangular; propodus elongate, about 1.3 times as long as the basis; palm with a proximal elongate projection carrying one grasping spine and two more triangular projections distally; dactylus long, with a few setulae on ventral margin.

Pereopods. Pereopods 3 (Fig. 4A) and 4 (Fig. 4B) subequal, 2-articulate, length about 1/5 of gills; basal article rectangular without setae; distal article triangular, a little longer than basal one, with 4 setae on pereopod 3 and 3 setae on pereopod 4. Pereopod 5 missing from this specimen. Pereopod 6 (Fig. 4C) and 7 (Fig. 4D) similar in feature but increasing in size respectively, 6-articulate; propodus with a proximal grasping spine. Penes (Fig. 4E) rounded, situated laterally, with a suture mediadly.

Abdomen (Fig. 4E) with a pair of appendages, a pair of lateral lobes and a single dorsal lobe. Appendages 1-articulate, acute distally provided with three basal setae, two setae mediadly and a row of setulae distally.

Allotype femaleBody length 3.2 mm. Flagellum of antenna 1 with 6 articles (Fig. 1B). Propodus of gnathopod 2 wider than in male, length about 2 times width (Fig. 3G). Oostegites on pereonite 3 setose, on pereonite 4 scarcely setose (Fig. 1B). Abdomen without appendages (Fig. 4F); lateral lobes with a single setae.

Intraspecific variation. The setal formula of the mandibular palp is constant in the specimens examined (1-2-1); however the number of teeth in the right lacinia mobilis varies between 4 and 6. The morphology of the maxilliped and maxillae is constant. A comparison of the species to the others in the genus is given in table 1.
FIGURE 3. *Deutella antonbruuni* sp. nov. A, male dorsal view; B, female dorsal view; C, male antenna 1; D, male antenna 2; E, male gnathopod 1; F, male gnathopod 2; G, female gnathopod 2. Scale bars: A,B: 1 mm; C,D: 0.3 mm; E: 0.2 mm; F,G: 0.5 mm.
FIGURE 4. Deutella antonbruuni sp. nov. A-E, male. A, pereopod 3; B, pereopod 4; C, pereopod 6; D, pereopod 7; E, abdomen (ventral view). F, female abdomen (ventral view). Scale bars: A,B: 0.05 mm; C,D: 0.5 mm; E,F: 0.1 mm.

Deutella indica, sp. nov. (Figs. 5-8)

**Etymology.** The specific name refers to the Indian Ocean, the ocean where the specimens were collected.

**Description.**

Holotype male

*Body length.* 8.5 mm.

**FIGURE 5.** *Deutella indica* sp. nov. Lateral view. A, male; B, female. Scale bar: 1 mm.
FIGURE 6. *Deutella indica* sp. nov. Male. A, upper lip; B, lower lip; C, maxilliped; D, right mandible; E, left mandible; F, maxilla 1; G, maxilla 2. Scale bars: 0.1 mm.

*Lateral view* (Fig. 5A). Head rounded. Pereonite 1 fused with head, suture present; pereonite 2 with a pair of lateral projections proximally and another pair situated medially
Fig. 5A, 7A; pereonites 3 and 4 subequal in size, pleura not well-developed; pereonites 3, 4 and 5 subequal in length; pereonite 7 the shortest.

**FIGURE 7.** *Deutella indica* sp. nov. A, male dorsal view; B, female dorsal view; C, male antenna 1; D, male antenna 2; E, male gnathopod 1; F, male gnathopod 2; G, female gnathopod 2. Scale bars: A,B: 1 mm; C,D: 0.5 mm; E: 0.3 mm; F,G: 0.5 mm.
**Gills** (Fig. 5A). Elongate, length about 4 times width.

**Mouthparts.** Upper lip (Fig. 6A) symmetrically bilobed, smooth apically. Mandibles (Fig. 6D,E) with 3-articulate palp; second article with 5 simple setae in the left mandible (Fig. 6E) and 6 in the right mandible (Fig. 6D); distal article of palp with a setal formula 2-7-1 and a medial single setae; mandibular molar robust; left mandible incisor and lacinia mobilis 5-toothed followed by 3 plumose setae; incisor of right mandible 6-toothed, lacinia mobilis serrate, followed by 2 plumose setae; molar flake present, rectangular and setose distally. Lower lip (Fig. 6B) with well-demarcated inner lobes; inner and outer lobes with apical setulae. Maxilla 1 (Fig. 6F) outer lobe with 6 robust setae; distal article of the palp with 5 robust setae and 3 teeth distally, and 3 setae medially. Maxilla 2 (Fig. 6G) inner lobe rectangular, carrying 9 setae distally; outer lobe, about 1.5 times larger than inner lobe, with ten apical setae. Maxilliped (Fig. 6C) inner plate rectangular with 4 plumose setae and one robust, short setae (like a “tooth”); outer plate about 2.5 times as large as inner plate, with 6 setae; palp 4-articulate, setose; penultimate article of the palp with a distal acute projection; dactylus without two rows of setulae.

**Antennae.** Antenna 1 (Fig. 7C) about 2/5 of body length; flagellum with 13 articles. Antenna 2 (Fig. 7D) with short setae (no swimming setae); basal article of the peduncle with a distal projection; flagellum 2-articulate.

**Gnathopods.** Gnathopod 1 (Fig. 7E) basis as long as ischium, merus and carpus combined; propodus length about 1.7 times width, palm with a proximal grasping spine and denticulate margin; dactylus strongly serrate. Gnathopod 2 (Fig. 7F) inserted on the anterior half of pereonite 2; coxa well-developed and provided with an acute projection; basis as long as pereonite 2; ischium rectangular; merus triangular; carpus short and triangular; propodus elongate, as long as the basis; palm with a proximal projection elongate carrying one grasping spine and 2 triangular projections, medially and distally respectively; dactylus long, with a few setulae on ventral margin.

**Pereopods.** Pereopods 3 (Fig. 8A) and 4 (Fig. 8B) subequal, 1-articulate, with 3 setae. Pereopod 5 (Fig. 8C) 6-articulate; propodus without grasping spines. Pereopod 6 (Fig. 8D) and 7 (Fig. 8E) similar in feature but increasing in size respectively, 6-articulate; propodus with a proximal grasping spine.

**Penes** (Fig. 8F) rounded, situated laterally, with a suture medially. Abdomen (Fig. 8F) with a pair of appendages, a pair of lateral lobes and a single dorsal lobe. Appendages 2-articulate; basal article short with three setae; distal article elongate with small setulae and one single setae distally.

**Allotype female**

Body length 6.4 mm. Pereonite 2 with the proximal projections less developed than in male and the medial projections lacking (Fig. 5B, 7B). Propodus of gnathopod 2 wider than in male (Fig. 7G). Oostegites on pereonite 3 and 4 setose (Fig. 5B). Abdomen without appendages (Fig. 8G); lateral lobes with a single seta.
Intraspecific variation. The structure and number of setae on the maxilliped and the maxillae are very constant in all specimens examined. However the setal formula of the mandibular palp is 1-x-2 with x ranging from 4 to 7. The number of articles of the antenna 2 flagellum in females varies between 9 and 11.

FIGURE 8. *Deutella indica* sp. nov. A-F, male. A, pereopod 3; B, pereopod 4; C, pereopod 5; D, pereopod 6; E, pereopod 7; F, abdomen (ventral view). G, female abdomen (ventral view). Scale bars: A,B: 0.05 mm; C-E: 0.5 mm; F,G: 0.1 mm.
**TABLE 1.** Comparison among the species of *Deutella.*

<table>
<thead>
<tr>
<th></th>
<th><em>D. antonbruuni</em> n.sp.</th>
<th><em>D. indica</em> n.sp.</th>
<th><em>D. aspiducha</em></th>
<th><em>D. californica</em></th>
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<tbody>
<tr>
<td>Body length (mm)</td>
<td>Male 4.5</td>
<td>5.5</td>
<td>4.8</td>
<td>5.5</td>
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<tr>
<td></td>
<td>Female 3.2</td>
<td>6.4</td>
<td>4.2</td>
<td>3.8</td>
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<td>Dorsal projections</td>
<td>Absent</td>
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<td>Present</td>
<td>Present</td>
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<tr>
<td>Lateral projections on pereonite 2</td>
<td>Male Absent</td>
<td>2 pairs</td>
<td>1 pair</td>
<td>Absent</td>
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<td>Antenna 1 flagellar articles</td>
<td>Male 7</td>
<td>11</td>
<td>6-7</td>
<td>12</td>
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<td></td>
<td>Female 6</td>
<td>9-11</td>
<td>4</td>
<td>12</td>
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<td>Antenna 2 flagellar articles</td>
<td>Male 2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Mandibles Knobs on distal article of palp</td>
<td>Male Absent</td>
<td>Asent</td>
<td>Present</td>
<td>Absent</td>
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<td></td>
<td>Setal formula 1-x-1, x=2</td>
<td>2-x-1, x=4-7</td>
<td>1-x-1, x=5</td>
<td>1-x-1, x=3-5</td>
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<td>Left incisor 5-toothed</td>
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<td></td>
<td>Right incisor 6-toothed</td>
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<td>Left lacinia mobilis 5-toothed</td>
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<td>Serrate</td>
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<td></td>
<td>Right lacinia mobilis 6-toothed</td>
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<td>Serrate</td>
<td>5-toothed</td>
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<td>Molar flake Present</td>
<td>Present</td>
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<td>Absent</td>
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<tr>
<td>Maxilla 1 Distal spines of outer lobe</td>
<td>Male 6</td>
<td>5</td>
<td>6</td>
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<td></td>
<td>Distal spines of palp 5</td>
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<td>Maxilla 2 Setae of outer lobe</td>
<td>Male 6</td>
<td>9</td>
<td>4</td>
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<td>Setae of inner lobe 6</td>
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<td>5</td>
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<td>Maxilliped Inner plate 1 “tooth”</td>
<td>4 setae</td>
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<td>Outer plate 6 setae</td>
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<td>4-5 setae</td>
<td>5-6 setae</td>
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<td></td>
<td>Distal projection on penultimate article of palp Present</td>
<td>Present</td>
<td>Absent</td>
<td>Present</td>
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<td>Gnathopod 1 grasping spines</td>
<td>Male 1</td>
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<td>Proximal projection of the propodus of gnathopod 2 male</td>
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<tr>
<td>Male abdominal appendages</td>
<td>1-articulate</td>
<td>2-articulate</td>
<td>1-articulate</td>
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**Discussion**

*Deutella antonbruuni* and *D. indica* are close to *D. mayeri* and *D. margaritae* by lacking dorsal projections. However, differences in the lateral projections, the seta formula, the distal projection on the penultimate article of the mandibular palp, and the morphology of pereopods 3 and 4 revealed that the specimens studied here are new species. A detailed comparison of the above morphological characters among the others known species of *Deutella* are included in table 1.
The setal formula of the mandibular palp in *D. indica* is unique within the genus *Deutella* and the family *Pariambidae* (Laubitz, 1993). In general, the setal formula of the third article of the mandibular palp is 1-x-1 in *Deutella* and related genera, or 1-x-y-1 in *Protella* and related genera (Mayer, 1903; McCain, 1968; Arimoto, 1976; Laubitz, 1993). This formula indicates the presence of one long seta at each end and one row (x) or two rows (x-y) of shorter setae. The seta formula in *D. indica* has 2 long setae near proximal end followed by 4-7 short setae and one long seta. Thus, the seta formula for the present species is assigned as 2 (long setae near proximal end)-x (number of short setae)-1 (long seta near apical end). The diagnosis of the genus *Deutella* and family *Pariambidae* have been modi-
fied in this study to include this seta formula. The formula 2-x-1 has recently been reported in a new species of *Paraprotella* collected from Phuket Island, Thailand (Takeuchi & Guerra-García, in press).

Laubitz (1993) transferred the genus *Deutella* from the family Protellidae McCain, 1970 to the new family Pariambidae Laubitz, 1993, mainly on the basis of lacking a molar flake, a different seta formula than 1-x-y-1 and six instead of seven spiniform setae on the outer plate of the maxilla 1. Although the genus *Deutella* is considered here to occur within the family Pariambidae, the two new species described here, *D. antonbruuni* and *D. indica*, both with a molar flake, do not support Laubitz’s classification. Guerra-García (in press (a)) discussed the validity of the family Pariambidae

![Biogeographical distribution of the Deutella species.](image)

*Deutella antonbruuni* and *D. indica* represent the first record of the genus *Deutella* for the Indian Ocean. *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* occurs from Central Chile, *D. vema* is known from Subantarctic waters of South America, *D. schieckei* was described from the Mediterranean and *D. philippinensis* from the Western Pacific (Fig. 9). The absence of records for Indian Ocean before this study were probably due to the lack of caprellid studies in this region (McCain & Steinberg, 1970). In fact, the two new species, *D. antonbruuni* and *D. indica*, could have a larger distribution area in the Indian Ocean. According to the IUCN Red List Categories (IUCN, 2001), both species, can be considered as Data
Deficient (DD). A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. Further studies dealing with the Caprellidea from the Indian Ocean should be addressed in the near future.

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