



Two new *Diastylis* (Cumacea: Diastylidae) from Antarctic waters: *Diastylis andeepae* and *D. catalinae*

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Abstract

Two new deep-sea cumaceans, *Diastylis andeepae* and *D. catalinae* are described from the Weddell Sea. *Diastylis andeepae* **n. sp.** can be distinguished from other members of the genus by a combination of characters including: carapace with small tubercles all over and anterior part with an arched row of teeth extending from each side of the pseudorostrum and disappearing a short distance before reaching the inferior margin of the carapace, ischium of the pereopod 2 with four strong teeth, endopod uropod of two articles. *Diastylis catalinae* **n. sp.** is a closely related species to *D. richardi* Fage 1929 recorded from the Bay of Biscay, however *D. catalinae* can be easily separated from *D. richardi* by having: (1) on each side of the anterior part of the carapace several teeth arranged in two non-uniform rows (randomly distributed and with two antero-lateral horns in *D. richardi*); (2) clearly visible pereonites 1 and 2 in dorsal view (hardly visible in *D. richardi*); (3) one tooth on each postero-lateral angle of the pereonite 5 (without teeth in *D. richardi*); and (4) one minute simple seta on article 4 of the antenna 2 (a long setulate seta in *D. richardi*).

Key words: Antarctica, Weddell Sea, deep-sea, new species

Introduction

At present, 18 species and subspecies of the family Diastylidae are known from the Antarctic waters (data based on Mühlenhardt-Siegel 1999; Corbera 2000; Błażewicz-Paszkowycz & Heard 2001; Petrescu & Wittmann 2003; Rehm *et al.* 2007; Rehm 2009). Of these 18 species, 7 belong to the genus *Diastylis*: *D. anderssoni anderssoni* Zimmer 1907; *D. mawsoni* Calman 1918; *D. corniculata* Hale 1937; *D. anderssoni armata* Ledoyer 1993; *D. enigmatica enigmatica* Ledoyer 1993; *D. galeronae* Ledoyer 1993; *D. enigmatica rossensis* Rehm 2009.

The members of the family Diastylidae are found throughout the world's oceans, and most of the described species come from depths greater than 1000 m (Day 1980; Jones 1969). However, the diversity of the Antarctic *Diastylis* is at a maximum between 50–650 m depth, decreasing substantially in deeper waters. Of the seven species and subspecies of *Diastylis* known from Antarctica, six were found between 0–650 m and only one species, *D. galeronae*, was confined to depths below 1000 m (data based on Mühlenhardt-Siegel 1999; Corbera 2000; Błażewicz-Paszkowycz & Heard 2001; Petrescu & Wittmann 2003; Rehm *et al.* 2007; Rehm 2009). The scarcity of species described from the deep Antarctic waters may reflect a low sampling effort. In this regard, the EASIZ II (Ecology of the Antarctic Sea Ice Zone) and ANDEEP (Antarctic Benthic Deep-Sea Biodiversity) surveys carried out in Antarctica revealed high levels of unrecorded biodiversity (see the expeditions reports in Arntz & Gutt 1999; Fütterer *et al.* 2003; Fahrback 2006).

Based on the species of *Diastylis* obtained by the R/V Polarstern during these surveys in the Weddell Sea, Antarctic Peninsula and South Sandwich Islands together with a study of the relevant type material, two new species recorded in deep waters from 2657–4698 m were described: the preparatory female of *Diastylis andeepae*; and the preparatory female and the subadult male of *D. catalinae*. This contribution improves on our knowledge of the Antarctic deep fauna.

Material and methods

The material collected in the Antarctic Peninsula, South Sandwich Islands and the Weddell Sea during four German Antarctic deep-sea surveys carried out by the R/V *Polarstern* was examined. A brief account dealing with these surveys is presented: EASIZ II (ANT XV/3) from February to March 1998, ANDEEP I and II (ANT XIX/3/4) from January to March 2002 and ANDEEP III (ANT XXII/3) from January to March 2005 (additional details regarding sampling stations, see Arntz & Gutt 1999; Fütterer *et al.* 2003; Fahrbach 2006). The stations were sampled using an epibenthic sledge with a net of 0.5 mm mesh size and the specimens were preserved in 96% ethanol. Specimens of the two species herein studied were found at five stations in two of the four surveys (see Material examined sections).

The specimens used for the illustrations were stained with Chlorazole Black E. The appendages were dissected and mounted in glycerin on temporary slides. The illustrations were made with the aid of drawing tubes attached to a Leica dissecting microscope and a Carl Zeiss Axioskop compound microscope. The pencil drawings were captured in digital format and the line drawings were made using a Wacom digitiser board as described by Coleman (2003).

Body lengths were measured from the tip of the pseudorostrum to the end of the telson. In the descriptions of the appendages, “remaining articles together” stands for the combined length from ischium to dactylus, not including terminal setae. The article lengths of the appendages, antenna 1 and uropod were measured as follow: first article of the antenna 1 and basis of the appendages along midline; second and third articles of the antenna 1, ischium to dactylus of the appendages and the uropod peduncle along longer margin (as proposed by Mühlenhardt-Siegel 2005).

We used the term sinuate setae for the setae that are: simple, very long, translucent and of a uniform thickness. For the other types of setae we follow the terminology presented by Alberico and Roccatagliata 2008.

All dissected appendages were carefully transferred to permanent slides which were prepared using glycerin jelly. Other body parts were stored in vials containing 96% ethanol.

Reference and type specimens were deposited in the invertebrate collection of the Zoologisches Museum, Hamburg (ZMH), Germany.

In addition to the specimens listed in the “Material examined” sections (see below), the following type material deposited in the Muséum National d’Histoire Naturelle, Paris was examined:

- *Diastylis richardi* Fage 1929. Gascogne Golf, 1910 Campaign, Sta. 2964, 20 July, 4380 m: 1 preparatory female (Co-type Cu 140).

Order: Cumacea Kröyer 1846

Family: Diastylidae Bate 1856

Genus: *Diastylis* Say 1818

Diastylis andeepae n. sp.

(Figures 1–4)

Material examined. R/V “*Polarstern*”. ANDEEP I (ANT XIX/3). West Weddell Sea, Sta. 46–7, 60°38.35′S, 53°57.36′W, 2893.6 m, 30 January 2002: 1 manca (ZMH K-42178). ANDEEP III (ANT XXII/3). East Weddell Sea, Sta. 80–9, 70°39.07′S, 14°43.36′W, 3103 m, 23 February 2005: 1 preparatory ♀ (with an isopod on basis of pereopod 1) (holotype ZMH K-42179).

Diagnosis. Carapace with small tubercles all over, inferior margin serrated; anterior part with an arched row of teeth on each side of the pseudorostrum, an oblique row of three teeth on each side of the frontal lobe fissures, and two middorsal rows of small teeth. Pereopod 2, ischium with four strong teeth. Pereopods 3 and 4 without rudimentary exopods. Telson with five cuspidate setae on each side. Uropod endopod of two articles.

Description of the preparatory female (based on the holotype ZMH K-42179)

Total length: approximately 11.75 mm.

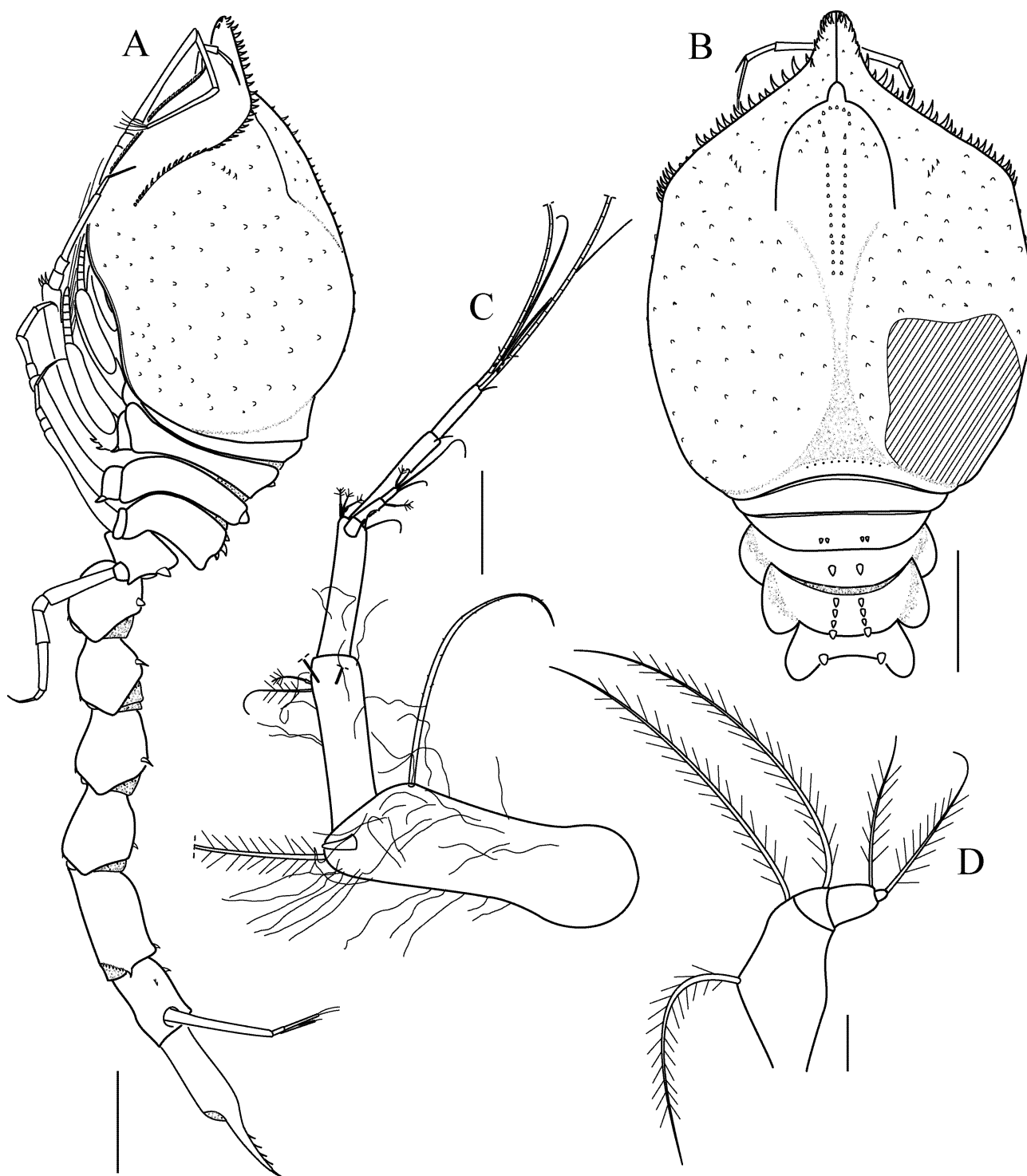


FIGURE 1. *Diastylis andepae* n. sp., preparatory female (holotype ZMH K-42179). A, habitus in lateral view; B, carapace and pereon in dorsal view (right lateral side of carapace slightly broken); C, antenna 1; D, antenna 2. Scale bars: 1 mm (A, B), 0.2 mm (C), 0.1 mm (D).

Carapace (Figures 1A, B) approximately 1.3 times as long as wide, surface with small tubercles all over, inferior margin serrated; anterior part with: (1) an arched row of teeth, extending from each side of the pseudorostrum and disappearing a short distance before reaching the inferior margin of the carapace, (2) an oblique row of three teeth on each side of the frontal lobe fissures, and (3) two rows of small teeth in the

middle of the frontal lobe, running posteriorly from ocular lobe and reaching approximately middle of the carapace. Ocular lobe approximately as long as wide, without lenses. Pseudorostrum approximately 4 times as long as the ocular lobe. Antennal notch shallow and smooth.

Pereon (Figures 1A, B) approximately 0.4 times as long as the carapace. Pereonites 1, 2, 3 subequal in length, pereonite 4 the longest, postero-lateral angles of the pereonite 5 rounded in dorsal view. Pereonites 2–5 with dorso-lateral teeth: pereonite 2 with four, pereonites 3 and 5 with two, and pereonite 4 with two rows of four.

Pleon (Figure 1A) approximately 0.8 times as long as the cephalothorax, pleonites 1–6 with two small dorso-lateral teeth each.

Telson (Figure 4C) approximately twice as long as last pleonite, with several sinuate setae on dorsal surface. Each side with five cuspidate setae and distal end with two long stout cuspidate setae.

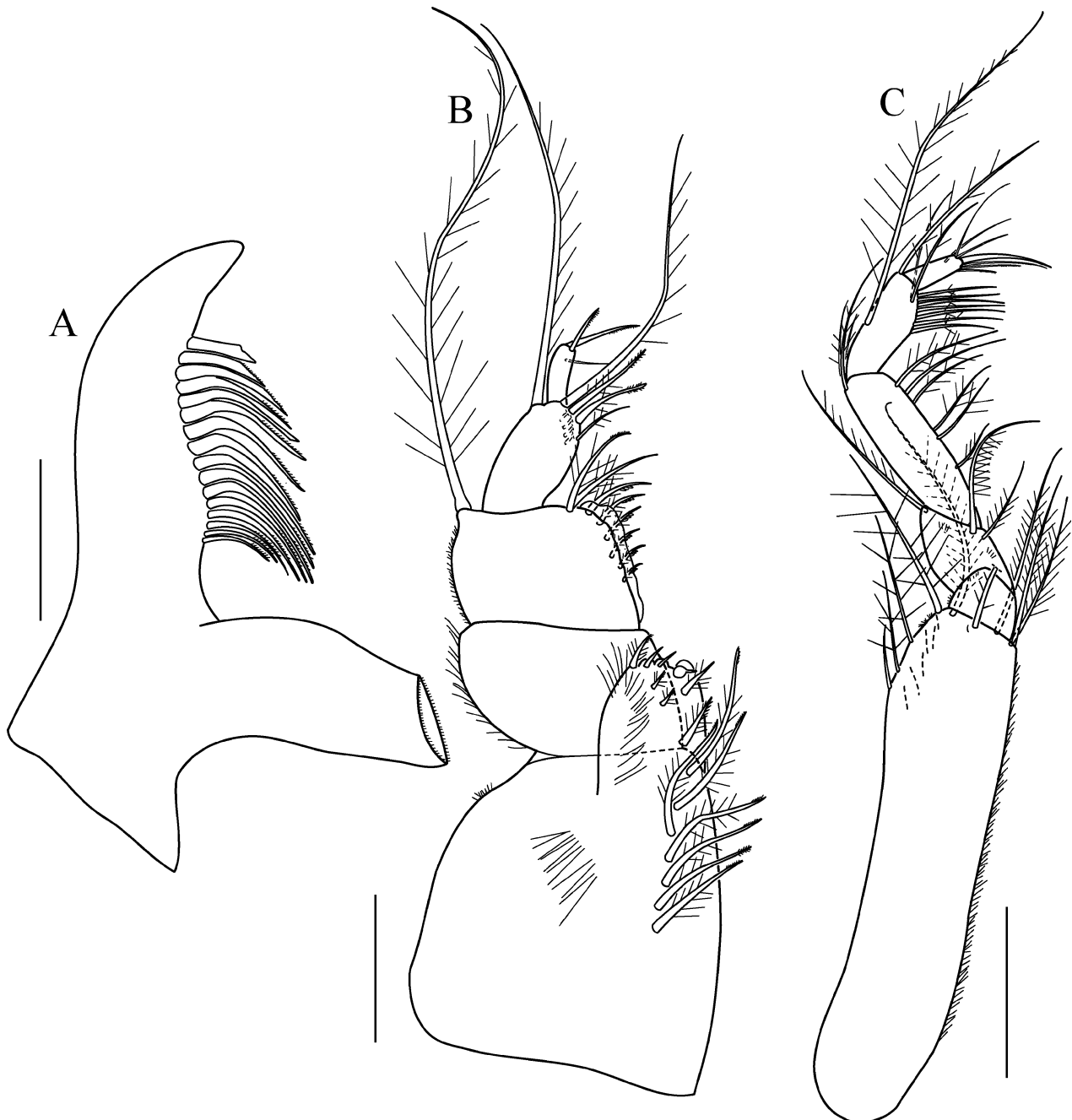


FIGURE 2. *Diastylis andeepae* n. sp., preparatory female (holotype ZMH K-42179). A, right mandible (broken during dissection); B, maxilliped 1; C, maxilliped 2. Scale bars: 0.2 mm (A, B), 0.5 mm (C).



FIGURE 3. *Diastylis andeepae* n. sp., preparatory female (holotype ZMH K-42179). A, maxilliped 3; B, pereopod 1; C, pereopod 2. Scale bars: 0.5 mm (A–C).

Antenna 1 (Figure 1C), peduncle, articles 1, 2 and 3 with thin sinuate setae; article 1 approximately 0.9 times as long as articles 2 and 3 combined, inner distal corner with one setulate seta and one large tooth, outer distal corner with one large seta with tiny setulae; article 2 approximately 1.2 times as long as article 3, with one setulate seta, one broom seta and two small simple setae; article 3 with three broom and two simple setae distally. Main flagellum of three articles; article 1 slightly longer than articles 2 and 3 combined, articles 2 and 3 with one aesthetasc each. Accessory flagellum almost reaching middle of the article 1 of the main flagellum; of three articles, article 2 the longest.

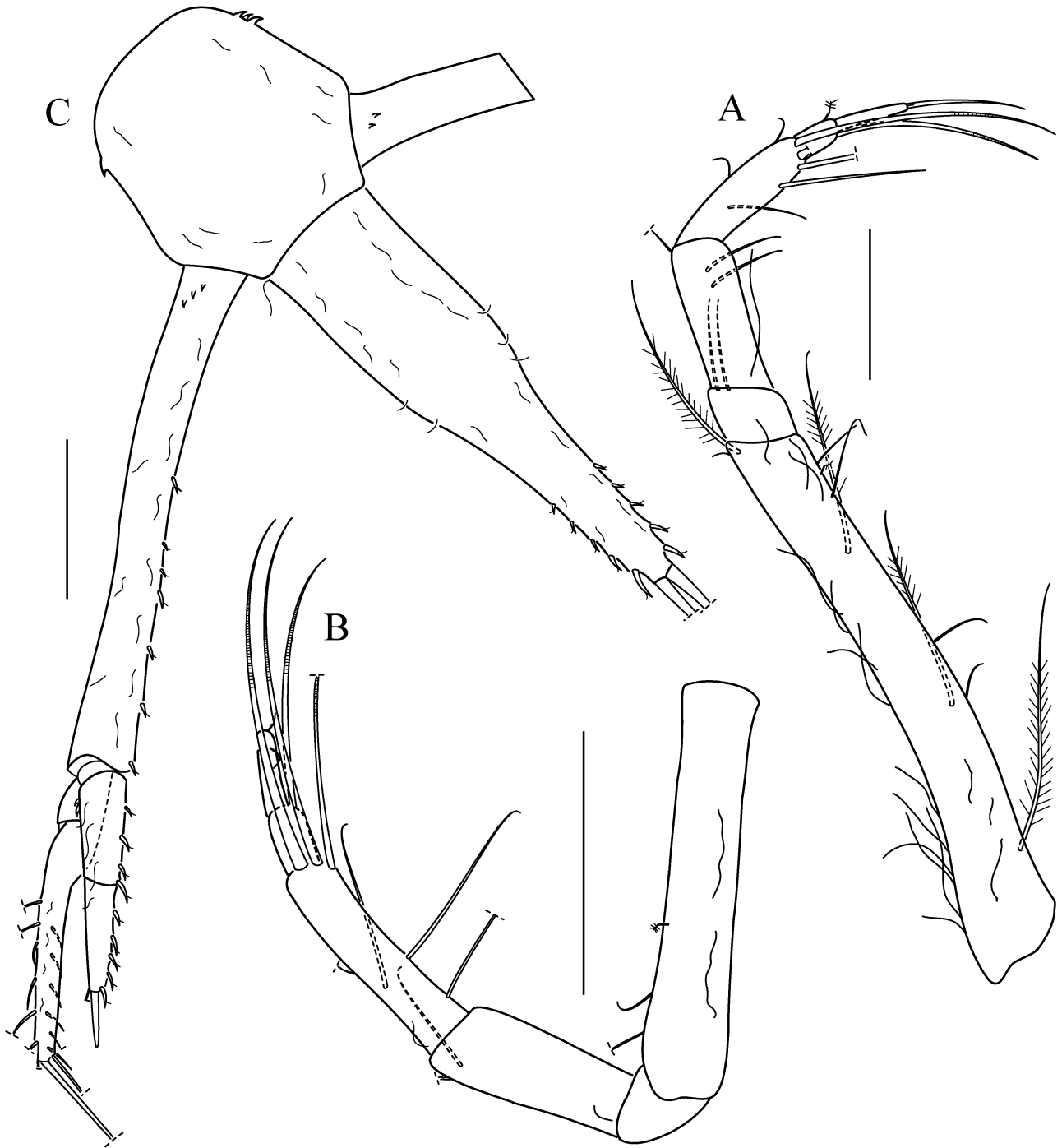


FIGURE 4. *Diastylis andeepae* n. sp., preparatory female (holotype ZMH K-42179). A, pereopod 3; B, pereopod 5 (dactylus distal setae broken); C, telson and uropod. Scale bars: 0.5 mm (A–C).

Antenna 2 (Figure 1D) of four articles, article 1 the longest, article 4 minute. Article 1 with two setulate setae, articles 2–4 with one setulate seta each.

Right mandible (Figure 2A) boat-shaped, pars incisive with 16 setae. Left mandible not dissected.

Maxilla 1, outer endite with 14 cuspidate distal setae and one small seta on outer margin, inner endite with four unequal and two small simple setae distally (not drawn but very much alike to the maxilla 1 of *Diastylis fabrizioi* presented by Alberico and Roccatagliata 2008).

Maxilla 2, outer endite with three serrate and three serrulate setae, inner endite with three serrate and one serrulate setae (not drawn but very much alike to the maxilla 2 of *Diastylis fabrizioi* presented by Alberico and Roccatagliata 2008).

Maxilliped 1 (Figure 2B), basis with seven setuloserrulate setae on inner distal margin. Endite with seven setae (simple, setuloserrulate and setulate). Carpus, inner margin with a row of six setuloserrulate setae and simple setae (not drawn), inner distal corner with one setulate and one setuloserrulate seta, outer distal corner with one large setulate seta. Propodus with many simple setae (only basis drawn), two long and one short setulate setae and two setuloserrulate setae. Dactylus with simple and serrulate setae.

Maxilliped 2 (Figure 2C), basis approximately as long as remaining articles together, with eight setulate setae (four of them with thicker setulae) and one short simple seta on outer margin and distally. Merus with three setulate setae distally. Carpus with three unequal setulate setae on outer distal corner and six setulate setae on inner margin. Propodus, outer margin with two setulate setae, inner margin with nine barely setulate setae (distal half finely serrulate). Dactylus with serrulate and simple setae distally.

Maxilliped 3 (Figure 3A), basis–carpus with several thin sinuate setae. Basis approximately 1.6 times as long as remaining articles together, inner margin with setulate setae and several teeth, distal process with five stout setulate setae (one of them shorter). Ischium distal margin with one tooth, inner margin with three small teeth and three setulate setae. Merus with two teeth, outer margin with one and inner margin with two setulate setae. Carpus inner margin with two setulate setae and one tooth, dorsal surface with a row of three setulate setae and outer distal corner with two setulate setae. Propodus with three barely setulate setae on inner margin and one simple seta distally. Dactylus with several simple and serrulate setae. Exopod with flagellum of six articles.

Pereopod 1 (Figure 3B), basis–propodus with thin sinuate setae. Basis 0.85 times as long as remaining articles together, with setulate setae on both margins and distally, and teeth on both margins and on dorsal surface. Ischium and merus combined approximately 0.6 times as long as carpus. Merus with two teeth on dorsal surface and two setulate setae. Carpus with one setulate seta. Merus and carpus combined 0.76 times as long as propodus and dactylus combined. Dactylus approximately as long as propodus. Last two articles with simple setae only. Exopod with flagellum of seven articles.

Pereopod 2 (Figure 3C), all articles with thin sinuate setae. Basis approximately 0.8 times as long as remaining articles together, with setulate setae on inner and distal margins, and teeth on both margins and on dorsal surface. Ischium distal margin with four large teeth on inner corner and four smaller teeth on outer corner. Ischium and merus combined approximately 0.7 times as long as carpus. Merus, distal margin with three setulate setae and one tooth on each corner. Carpus approximately 1.4 times as long as propodus and dactylus combined. Last three articles with simple setae only. Exopod with flagellum of seven articles.

Pereopod 3 (Figure 4A), basis–merus with thin sinuate setae. Basis slightly longer than remaining articles together; inner margin with three setulate setae, one broom seta and several small simple setae; distal outer corner with one setulate seta. Ischium and merus with two simple (annulate?) setae each. Carpus slightly longer than merus, with two simple (annulate?) setae basally (one broken, not drawn) and four annulate setae distally. Propodus with one annulate and one broom seta distally. Dactylus with one small simple seta near middle of article and two simple setae distally (one minute, one large). Without exopod.

Pereopod 4 as pereopod 3 except for: basis approximately 0.8 times as long as remaining articles together, inner margin with one tooth basally, distal outer corner without seta. Carpus slightly shorter than merus, with four simple (annulate?) setae basally.

Pereopod 5 (Figure 4B), basis, merus and carpus with thin sinuate setae. Basis approximately 0.6 times as long as remaining articles together, with simple setae and one broom seta. Merus with one simple (annulate?) seta. Carpus slightly longer than merus, with three simple (annulate?) setae basally and with three annulate setae distally. Propodus with one annulate seta distally. Dactylus with one small simple seta near middle of article. Without exopod.

Uropod (Figure 4C) with several sinuate setae. Peduncle slightly longer than telson, dorsal surface with two–three teeth apically, inner margin with seven–nine cuspidate setae. Endopod approximately 0.8 times as long as exopod, of two articles: article 1 slightly longer than article 2, with three–four cuspidate setae on inner margin and one–two teeth on outer margin; article 2 with four–five cuspidate setae on inner margin and one cuspidate seta, almost reaching end of exopod, distally. Exopod with simple setae on both margins and three unequal simple setae distally.

Male unknown.

Etymology. This species is named after the acronym of the expedition, ANDEEP.

Distribution. Antarctic waters, East and West Weddell Sea, between 2893.6 m and 3103 m depth.

Remarks. To date, a total of 14 species (including the new species herein described) having two articles on the uropod endopod are known for the genus *Diastylis*. Seven of these species have been described from the Southern Hemisphere, namely *D. fimbriata* Sars 1873 (Brazil), *D. horrida* Sars 1887 (Kerguelen Is.), *D. argentata* Calman 1912 (Chile), *D. granulata* Zimmer 1921 (Argentina), *D. zimmeri* Ledoyer 1977 (Kerguelen Is.), *D. geocostae* Băcescu & Petrescu 1991 (Brazil), and *D. andeepae* **n. sp.** (Weddell Sea).

Three of the six above mentioned species are readily distinguished from *Diastylis andeepae* **n. sp.**: *D. argentata* and *D. granulata* by having on the carapace a pair of antero-lateral horns; and *D. geocostae* by presenting two oblique ridges enclosing a flat anterior area or plateau. *Diastylis zimmeri*, *D. fimbriata*, *D. horrida* and *D. andeepae* **n. sp.** seem to be closely related species. None of these four species has a pair of antero-lateral horns or plateau. However, they can be rapidly separated by the arrangement of their carapace sculptures: *D. zimmeri* has small teeth, more densely distributed on the anterior part of the carapace, and one groove on each side of it; *D. fimbriata* has a strong row of teeth on each lateral side of the carapace; *D. horrida* shows numerous unequal teeth all over the carapace, whereas *D. andeepae* has on each side of the anterior part of the carapace an arched row of teeth, which extends from pseudorostrum and disappears a short distance before reaching the inferior margin of the carapace. *Diastylis andeepae* is more similar to *D. horrida* than to the other two species without antero-lateral horns or plateau (*D. fimbriata* and *D. zimmeri*). Concerning the carapace sculpture, Ledoyer (1977) noted the variability in the number of spines and teeth in *D. horrida* from the Kerguelen according to sex and developmental stage; however, he mentioned nothing comparable to the antero-lateral row of teeth as present in the new species. Nevertheless, these two species have further differences: small tubercles all over the carapace in the new species (small and large teeth in *D. horrida*); middorsal rows of small teeth at frontal lobe reaching middle part of the carapace in *D. andeepae* (rows of large teeth and reaching almost the posterior margin of the carapace in *D. horrida*); pereonites 3 to 5 of *D. andeepae* with dorso-lateral longitudinal rows of teeth, particularly distinctive on pereonite 4; whereas *D. horrida* has “transverse rows of spines” on pereonites (Sars 1887).

Additional differences between the new species and *D. horrida* are detectable in the armature of antenna, pereopods and telson: antenna 1 basal article with one strong tooth in *D. andeepae* (with two strong teeth in *D. horrida*); ischium of pereopod 2 with four strong teeth in the new species (with two teeth in *D. horrida*); telson with five pairs of lateral cuspidate setae and dorsal surface smooth in *D. andeepae* (with nine pairs of lateral cuspidate setae and a row of six dorso-median teeth along preanal part in *D. horrida*).

In addition to the carapace sculpture, *D. andeepae* can be distinguished from other members of the genus by having on ischium of pereopod 2 four strong teeth. This is a unique character within the group. As stated above, *Diastylis horrida* has only two teeth and in the genus we found only one species with several teeth on ischium of pereopod 2 as in the new species, *Diastylis jonesi* Reys, 1972, however only one of these teeth is large and the other four are small.

***Diastylis catalinae* n. sp.**

(Figures 5–8)

Material examined. R/V “Polarstern”. ANDEEP III (ANT XXII/3). East Weddell Sea, Sta. 81–8, 70°32.02′S, 14°35.05′W, 4392 m, 24 February 2005: 1 juvenile (ZMH K-42180). West Weddell Sea. Sta. 110–8, 64°0.52′S, 43°02.09′W, 4698 m, 10 March 2005: 1 subadult ♂ (paratype ZMH K-42181). Sta. 121–11, 63°36.19′S, 50°37.15′W, 2657 m, 15 March 2005: 2 preparatory ♀♀ (holotype ZMH K-42182; paratype 42183), 1 manca (paratype ZMH K-42183).

Diagnosis. Carapace, surface translucent, inferior margin serrated, anterior part with several teeth arranged in two non-uniform rows on each side of the pseudorostrum. Female: fourth article of antenna 2 with a minute seta, pereopods 3 and 4 with rudimentary exopods, telson with six–seven cuspidate setae on each side, uropod endopod of three articles.

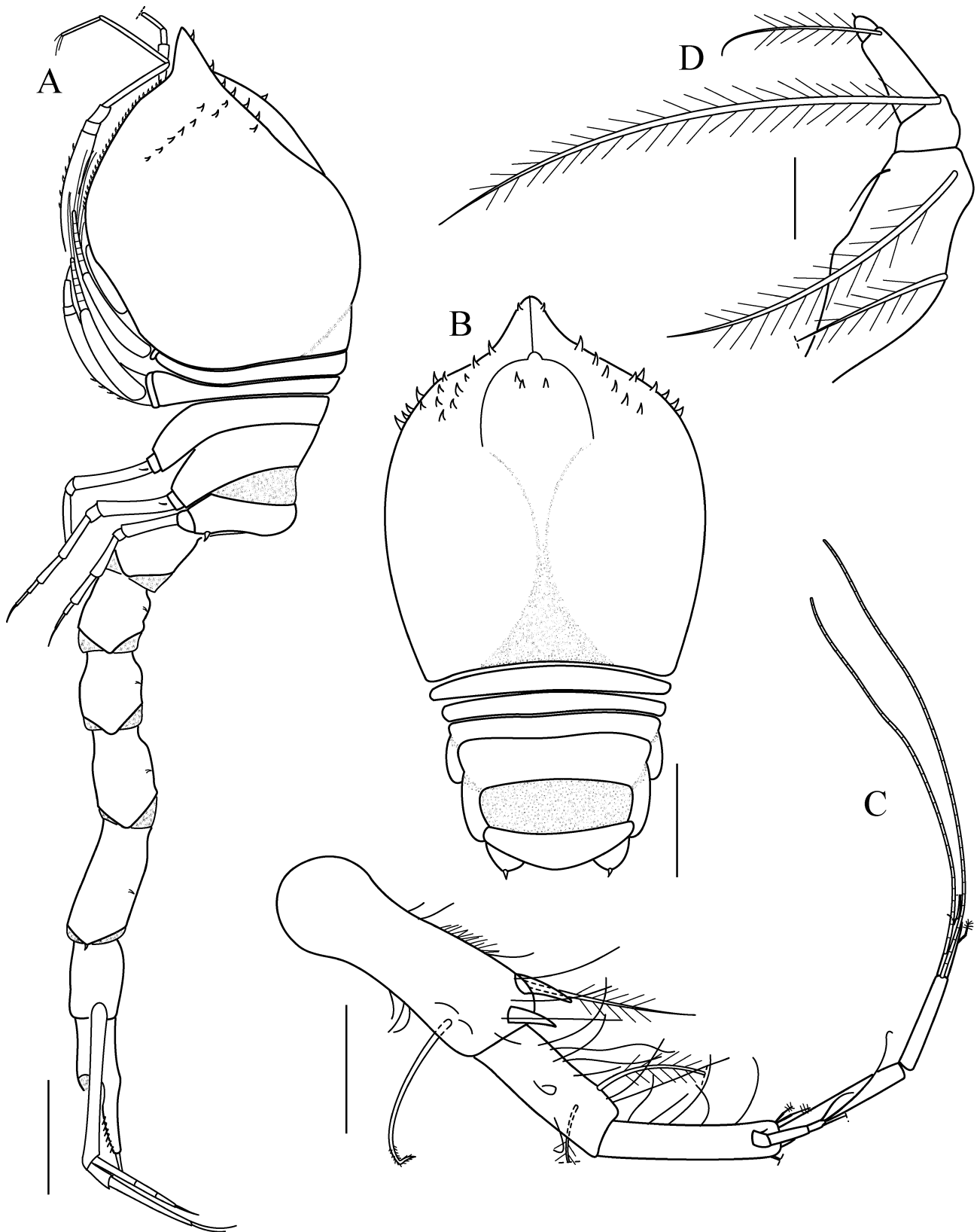


FIGURE 5. *Diastylis catalinae* n. sp., preparatory female (holotype ZMH K-42182). A, habitus in lateral view; B, carapace and pereon in dorsal view; C, antenna 1; D, antenna 2. Scale bars: 1 mm (A, B), 0.2 mm (C), 0.1 mm (D).

Description of the preparatory female (based on the holotype ZMH K-42182)

Total length: approximately 9 mm.

Carapace (Figures 5A, B), surface translucent, approximately 1.2 times as long as wide, inferior margin serrated, anterior part of carapace with several teeth arranged in two non-uniform rows on each side of it: one row extends backwards from the tip of the pseudorostrum and runs parallel to the frontal lobe fissure, the second row starts at middle of the other row of teeth, runs downwards perpendicular to it, and disappears a short distance before reaching inferior margin of carapace. Frontal lobe with three teeth. Ocular lobe wider than long, without lenses. Pseudorostrum approximately 6 times as long as ocular lobe length. Antennal notch shallow and smooth.

Pereon (Figures 5A, B) approximately 0.54 times as long as the carapace. Pereonites 1-3 subequal in length, pereonite 4 the longest, postero-lateral angles of pereonite 5 rounded in dorsal view and with one tooth each.

Pleon (Figure 5A) slightly shorter than cephalothorax, pleonites 2-5 with two small dorso-lateral teeth.

Telson (Figure 8C) approximately 1.7 times as long as last pleonite, with several small simple setae on dorsal surface. Each side with six-seven cuspidate setae and distal end with two long stout cuspidate setae (tips truncated).

Antenna 1 (Figure 5C), peduncle, articles 1-3 with thin sinuate setae; article 1 approximately 0.8 times as long as articles 2 and 3 combined, inner margin with small simple setae, inner distal corner with one setulate seta and two large teeth, outer margin with one seta with small setulae distally; article 2 approximately 0.9 times as long as article 3, with two setulate setae; article 3 with one simple and two broom setae on distal margin. Main flagellum of three articles, article 1 approximately 0.9 times as long as articles 2 and 3 combined; articles 2 and 3 with one aesthetasc each. Accessory flagellum almost reaching 1/3-way along article 1 of main flagellum; of three articles, article 2 the longest.

Antenna 2 (Figure 5D) of four articles, article 1 the longest, article 4 minute. Article 1 with two setulate setae and one small simple seta, articles 2 and 3 with one setulate seta each, article 4 with one minute seta.

Right mandible (Figure 6A), pars incisive with 13 setae. Left mandible (not drawn), pars incisive with 13 setae and a well-developed lacinia mobilis.

Maxilla 1, outer endite with 14 cuspidate distal setae and one small seta on outer margin, inner endite with four unequal and two small simple setae distally (not drawn but very much alike to the maxilla 1 of *Diastylis fabrizioi* presented by Alberico and Roccatagliata 2008).

Maxilla 2, outer endite with three serrate and three serrulate setae, inner endite with three serrate and one serrulate setae (not drawn but very much alike to the maxilla 2 of *Diastylis fabrizioi* presented by Alberico and Roccatagliata 2008).

Maxilliped 1 (Figure 6B), basis with five setuloserrulate setae on inner distal margin. Endite with nine setae (simple and setulate). Carpus, inner margin with a row of eight setuloserrate setae and simple setae (only some of them drawn), outer distal corner with one large and one short setulate seta. Propodus with simple setae, two long setulate setae and two serrate setae. Dactylus with simple and serrulate setae.

Maxilliped 2 (Figure 6C), basis 0.86 times as long as remaining articles together, with three setulate setae (one of them with thicker setulae) and one short simple seta distally. Merus with three setulate setae distally. Carpus with two unequal setulate setae on outer distal corner and five setulate setae on inner margin. Propodus, outer margin with two setulate setae and two small teeth, inner margin with six barely setulate setae (distal half finely serrulate). Dactylus with serrulate and simple setae distally.

Maxilliped 3 (Figure 7A), basis 1.56 times as long as remaining articles together, inner margin with setulate setae and several teeth, distal process with five stout setulate setae (one of them shorter). Ischium, distal margin with one large tooth and one setulate seta, inner margin with three small teeth. Merus with sinuate setae, inner margin with one tooth and three setulate setae, outer margin with one setulate seta. Carpus, inner margin with five setulate setae and outer distal corner with two unequal setulate setae. Propodus with two barely setulate setae on inner margin and one simple seta on outer distal corner. Dactylus with several simple setae (some of them could be serrulate). Exopod with flagellum of five articles.

Pereopod 1 (Figure 7B), basis approximately 0.7 times as long as remaining articles together, with setulate setae on both margins and distally, and teeth on both margins and on dorsal surface. Ischium and merus combined approximately 0.6 times as long as carpus. Merus with one tooth on inner distal corner and

three setulate setae distally. Propodus with one setulate seta and several small simple setae. Merus and carpus combined approximately 0.7 times as long as propodus and dactylus combined. Dactylus approximately 0.6 times as long as propodus. Last two articles with simple setae only. Exopod with flagellum of six articles.

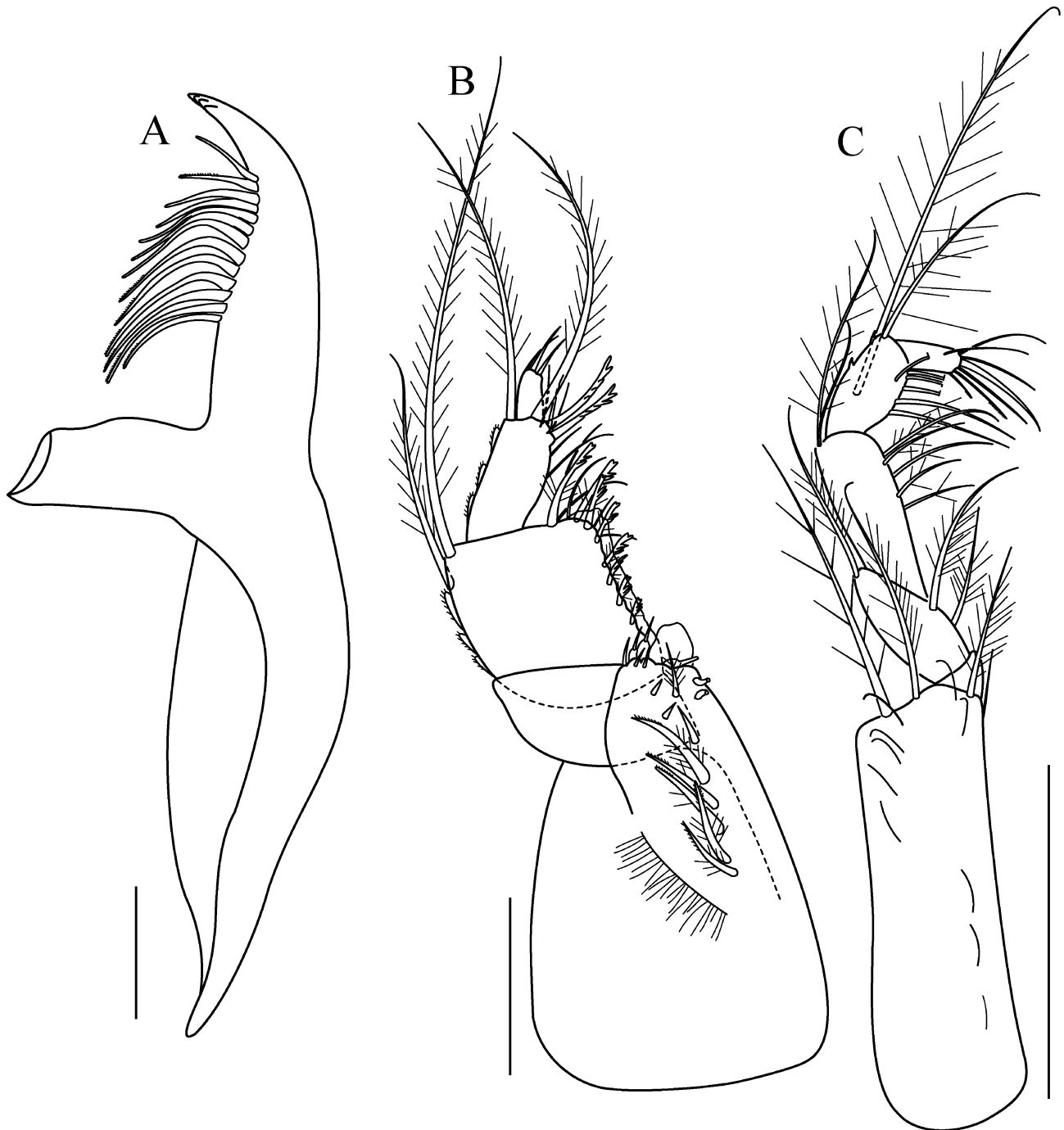


FIGURE 6. *Diastylis catalinae* n. sp., preparatory female (holotype ZMH K-42182). A, right mandible; B, maxilliped 1; C, maxilliped 2. Scale bars: 0.2 mm (A, B), 0.5 mm (C).

Pereopod 2 (Figure 7C), basis approximately 0.6 times as long as remaining articles together, dorsal surface with one tooth basally, inner margin with setulate setae and teeth, and distal margin with one stout simple seta. Ischium with two teeth on inner distal corner. Ischium and merus combined approximately half as long as carpus. Carpus approximately as long as propodus and dactylus combined. Merus–dactylus with simple setae only. Exopod with flagellum of six articles.

Pereopod 3 (Figure 8A), basis approximately 0.9 times as long as remaining articles together, with two setulate setae and small simple setae. Ischium with one simple (annulate?) seta (broken, not drawn). Merus with two simple (annulate?) setae. Carpus 0.64 times as long as merus, with two simple (annulate?) setae basally and four annulate setae distally. Propodus with one annulate seta and one broom seta distally. Dactylus with one small simple seta half way along article. Exopod of two articles.

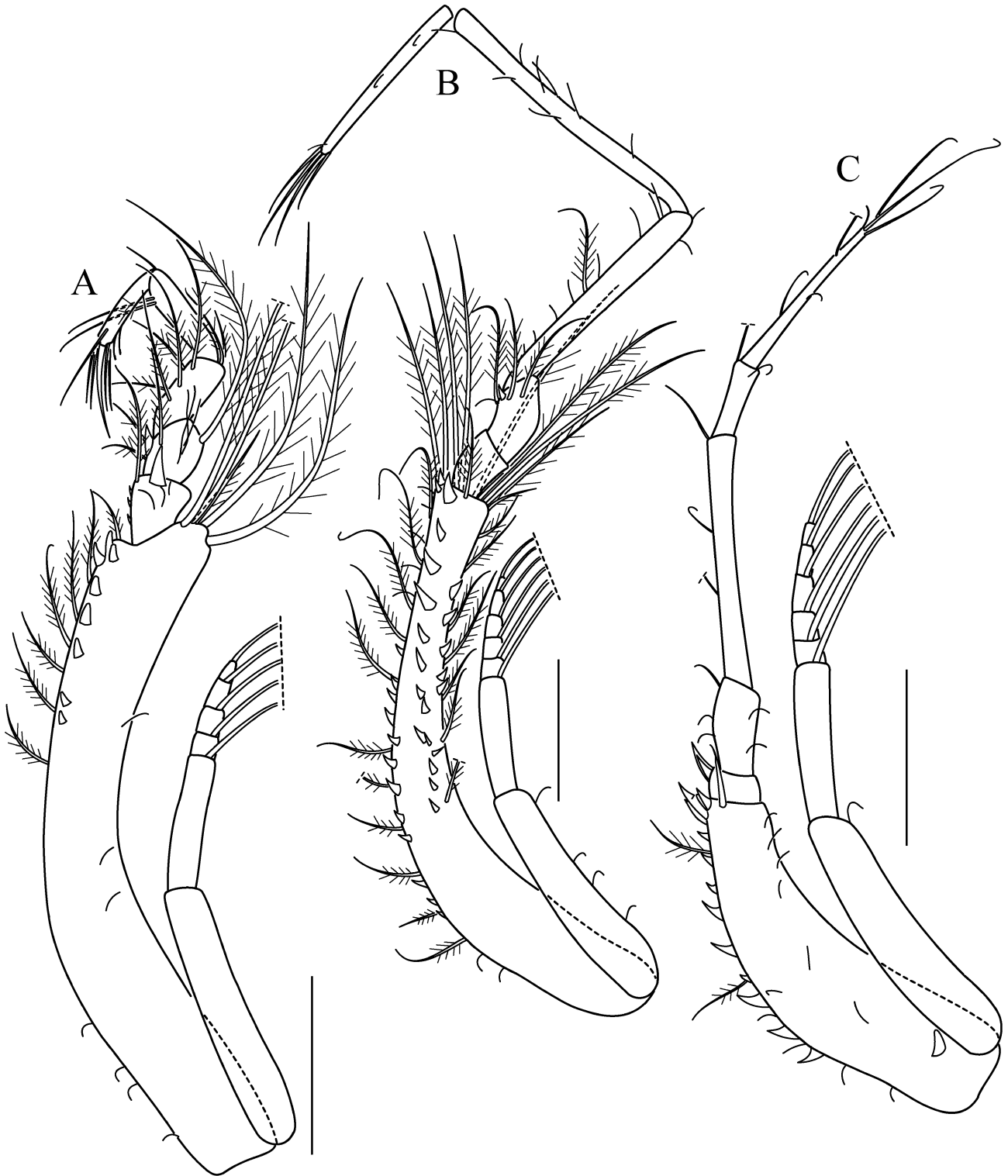


FIGURE 7. *Diastylis catalinae* n. sp., preparatory female (holotype ZMH K-42182). A, maxilliped 3; B, pereopod 1; C, pereopod 2. Scale bars: 0.5 mm (A–C).

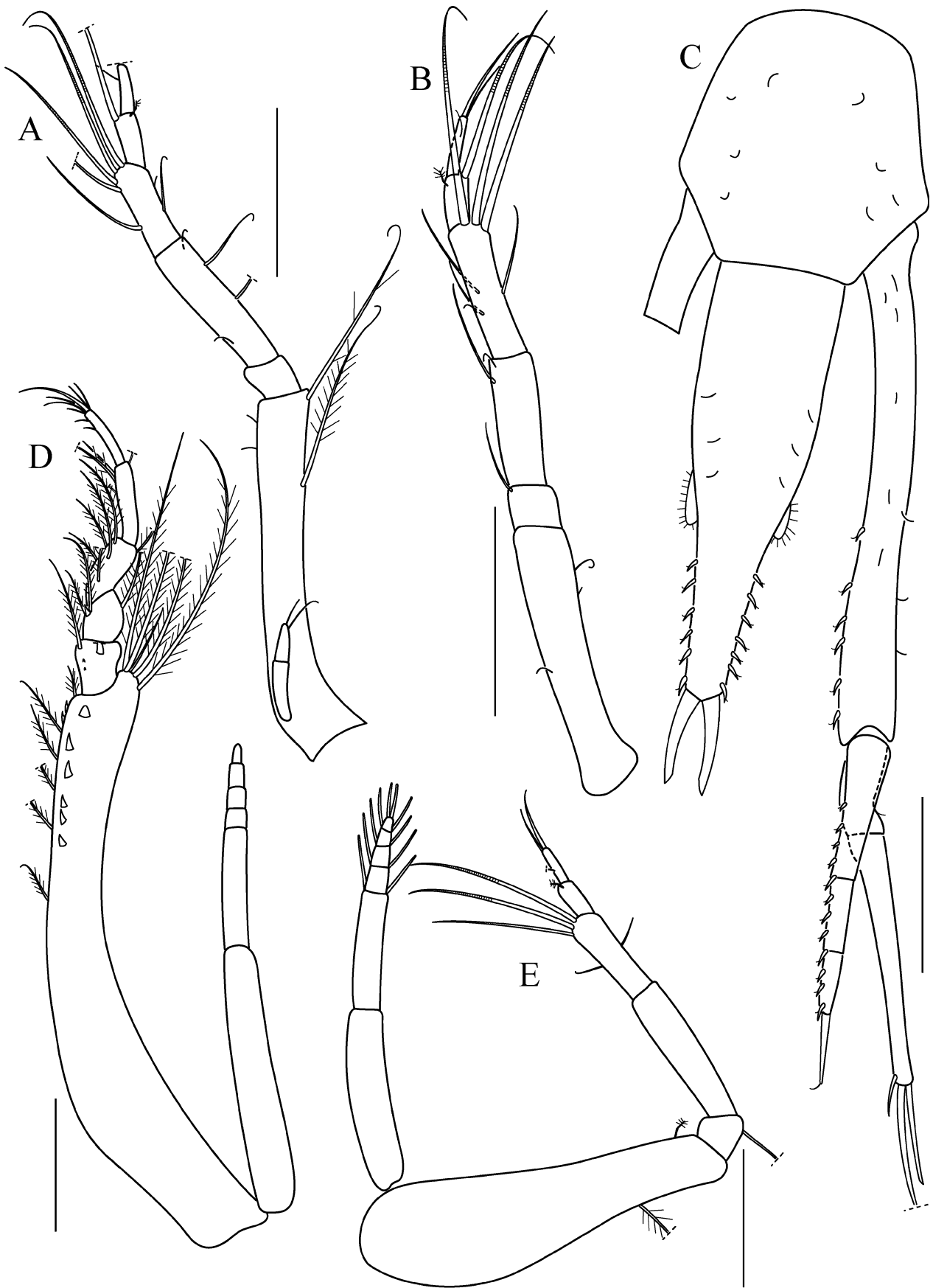


FIGURE 8. *Diastylis catalinae* n. sp. Preparatory female (holotype ZMH K-42182). A, pereopod 3 (dactylus distal setae broken); B, pereopod 5; C, telson and uropod. Subadult male (paratype ZMH K-42181). D, maxilliped 3; E, pereopod 3. Scale bars: 0.5 mm (A–E).

Pereopod 4 as pereopod 3 except for: basis 0.64 times as long as remaining articles together, with simple setae only. Carpus 0.85 times as long as merus. Dactylus with one small simple seta half way along article and two simple setae distally (one of them stouter). Exopod of two articles.

Pereopod 5 (Figure 8B), basis approximately 0.64 times as long as remaining articles together, with a few simple setae. Ischium and merus with one simple (annulate?) seta each. Carpus approximately as long as merus, with three simple (annulate?) setae basally and with three annulate setae distally. Propodus with one annulate seta and one broom seta distally. Dactylus with one small simple seta near middle of article and two simple setae distally (one of them stouter). Without exopod.

Uropod (Figure 8C), peduncle approximately 1.2 times as long as telson, with six–seven cuspidate setae on inner margin. Endopod approximately 0.8 times as long as exopod, of three articles: article 1 the longest, approximately as long as article 2 and 3 combined; article 2 slightly longer than article 3; article 1 with five, article 2 with three–four and article 3 with three cuspidate setae on inner margin; article 3 with one cuspidate seta, almost reaching end of exopod, distally. Exopod with three simple setae (tips truncated) distally: two long and one short.

Brief description of the subadult male (based on the paratype ZMH K–42181)

Total length: not measured, pleon broken.

Carapace as in female except for: frontal lobe with several teeth.

Pereon as in female.

Pleon broken, only pereonites 1 and 2 present, with developing pleopods.

Telson and uropods broken.

Antenna 2 incompletely developed, flagellum reaching pereopod 1.

Maxilliped 3 (Figure 8D) as in female except for: basis approximately 1.8 times as long as remaining articles together. Merus with two setulate setae on inner margin. Propodus with three barely setulate setae on inner margin. Exopod setae broken.

Pereopod 1 broken.

Pereopod 2, most setae broken. As in female except for: basis 0.57 times as long as remaining articles together. Ischium with one tooth on inner distal corner. Carpus approximately 1.2 times as long as propodus and dactylus combined. Exopod broken.

Pereopod 3 (Figure 8E), basis slightly shorter than remaining articles together, with one setulate seta and one broom seta. Ischium with one simple (annulate?) seta. Merus setae broken. Carpus approximately 0.6 as long as merus, with two simple (annulate?) setae basally and three annulate setae distally. Propodus annulate seta broken (not drawn), with one broom seta distally. Dactylus with one small simple seta near middle of article and two simple setae distally (one of them stouter). Exopod with flagellum of five articles.

Pereopod 4 as pereopod 3 except for: basis 0.65 times as long as remaining articles together, with a few small simple setae (setulate setae could be broken). Merus setae broken. Carpus approximately 0.7 times as long as merus. Exopod with flagellum of six articles.

Pereopod 5 as pereopod 3 except for: basis 0.65 times as long as remaining articles together, with a few small simple setae (setulate setae could be broken). Merus with one simple (annulate?) seta. Carpus slightly longer than merus. Without exopod.

Etymology. This species is named in memory of a special woman, Catalina Dittmar.

Distribution. Antarctic waters, East and West Weddell Sea, between 2657 m and 4698 m depth.

Remarks. *Diastylis richardi* Fage 1929, is a deep-sea species recorded from the Bay of Biscay in the East Atlantic Ocean at 4380 m depth and it is similar to *D. catalinae* **n. sp.** Based on the description and illustrations of *D. richardi* given by Fage (1929) and the examination of the type material, the new species can be easily distinguished from *D. richardi* by having: (1) on the anterior part of the carapace several teeth, arranged in two non-uniform rows on each side (randomly distributed and with two antero–lateral horns in *D. richardi*); (2) clearly visible pereonites 1 and 2 in dorsal view (hardly visible in *D. richardi*); (3) one tooth on each postero–lateral angle of the pereonite 5 (without teeth in *D. richardi*); (4) six–seven cuspidate setae of the same size on each side of the telson (ten cuspidate setae on each side, subterminal setae longer than the others in *D. richardi*); and (5) minute simple seta on article 4 of the antenna 2 (a long setulate seta in *D.*

richardi). The last feature is a distinctive characteristic within the genus. Most *Diastylis* have on the last article of antenna 2 a setulate seta or a seta with small setulae, but not a minute simple seta as in *D. catalinae*. Unfortunately not all descriptions of *Diastylis* species include a drawing of the antenna 2. For this reason, it is difficult to conclude for certain if this character is unique for the new species.

We only found one subadult male in poor condition. Because its pleon and most setae appendages were broken, only a brief description could be made. However, subadult males are generally similar to preparatory females; therefore the male found did not provide further information to improve the description and identification of the new species.

Conclusion

It is worth noting that of the seven *Diastylis* species from Southern Hemisphere with two articles in the uropod endopod, *D. andeepae* n. sp. is the only species recorded from Antarctica (Weddell Sea) and confined to deep waters (2893 and 3100 m). The other six species were found in shallower waters, between 18 and 540 m approximately. Concerning *D. catalinae*, the most remarkable fact is that the new species does not resemble any other member of the Antarctic *Diastylis* species but it is rather similar to *D. richardi* from the Northern Hemisphere. Based on this observations the knowledge of the deep-sea faunal composition is still scarce in comparison with that in shelf and upper slope environments. Vast areas of the deep-sea, especially of the Southern Hemisphere remain unexplored (Brandt *et al.* 2006). In particular, contrasting with the low number of Antarctic *Diastylis* up to now reported below 650 m depth, as many as 14 species (two of them already recorded from Antarctica) were collected between 750–5000 m depth by the EASIZ II and ANDEEP surveys (based on examination of the expedition material). Although some specimens of these new species are immature or badly damaged because of pressure or fixation, their study will increase the knowledge of the deep-sea fauna.

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