

New species and new records of deep-water caridean shrimps from the South Atlantic Ocean (Crustacea, Decapoda)

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ABSTRACT

One new species of deep-water caridean shrimp is described from the south-western Atlantic, *Heterocarpus inopinatus* n. sp. (Pandalidae). The new species can be promptly distinguished from the other species of the genus with a short but distinct exopod on the third maxilliped as follows: 1) from *Heterocarpus affinis* by the absence of incision on the dorsal carina of the third abdominal segment (carina distinctly incised in *H. affinis*); 2) from *Heterocarpus hostilis* by the lateral carinae on the carapace well defined (no distinct lateral carinae in *H. hostilis*); 3) and from *Heterocarpus dorsalis* by the carapace with dorsal carina unarmed on posterior one third of length (posterior two thirds in *H. dorsalis*). Additionally, four new records are established as follows: *Heterocarpus dorsalis* Bate, 1888 (Pandalidae) from the Atlantic Ocean; *Heterogenys microphthalmia* (Smith, 1885) (Oplophoridae) from the southwestern Atlantic; *Heterocarpus oryx* A. Milne-Edwards, 1881 (Pandalidae) and *Acantheephyra eximia* Smith, 1884 (Oplophoridae) from southeastern Brazil.

KEY WORDS

Deep-water shrimps,
Decapoda Caridea,
western Atlantic,
new records and species.

RÉSUMÉ

Nouvelle espèce et nouvelles répartitions de crevettes carides profondes de l'Atlantique Sud (Crustacea, Decapoda).

Une nouvelle espèce d'une crevette caride de profondeur est décrite de l'Atlantique sud-occidental, *Heterocarpus inopinatus* n. sp. (Pandalidae). La nouvelle espèce se distingue aisément des *Heterocarpus* à troisième maxillipède avec l'exopodite court mais est bien reconnaissable par les caractères suivants : 1) de *Heterocarpus affinis* par l'absence d'une incision sur la carène dorsale du troisième segment abdominal (carène avec une incision assez nette chez *H. affinis*) ; 2) de *Heterocarpus hostilis* par la carène latérale de la carapace bien définie (carapace sans carène latérale chez *H. hostilis*) ; 3) et de *Heterocarpus dorsalis* par la carapace avec la carène dorsale lisse sur le tiers postérieur de sa longueur (les deux tiers postérieurs chez *H. dorsalis*). De plus, quatre nouvelles répartitions sont établies : *Heterocarpus dorsalis* Bate, 1888 (Pandalidae) pour l'océan Atlantique; *Heterogenys microphthalmia* (Smith, 1885) (Oplophoridae) pour l'Atlantique sud-occidental ; *Heterocarpus oryx* A. Milne-Edwards, 1881 (Pandalidae) et *Acanthephyra eximia* Smith, 1884 (Oplophoridae) pour les eaux profondes du sud-est brésilien.

MOTS CLÉS

Crevettes d'eaux profondes,
Decapoda Caridea,
Atlantique occidental,
nouvelle espèce et
nouvelles répartitions.

INTRODUCTION

Knowledge of the deep-water decapods and stomatopods from the southwestern Atlantic has been broadened as a result of a series of reports based upon the collections obtained by the RV *Marion Dufresne* in the area (Guille & Ramos 1988). An account of the scientific reports published so far on the *Marion Dufresne* collections can be found in Tavares (1999).

In the present report one new species of deep-water shrimp is described, *Heterocarpus inopinatus* new species (Pandalidae). Additionally, four new records are established as follows: *Heterocarpus dorsalis* Bate, 1888 (Pandalidae) from the Atlantic ocean; *Heterogenys microphthalmia* (Smith, 1885) (Oplophoridae) from the southwestern Atlantic; *Heterocarpus oryx* A. Milne-Edwards, 1881 (Pandalidae) and *Acanthephyra eximia* Smith, 1884 (Oplophoridae) from southeastern Brazil.

The specimens have been deposited in the collections of the Muséum national d'Histoire naturelle, Paris (MNHN); Museu Nacional, Rio de Janeiro (MNRJ); National Museum of Natural History, Leiden (RMNH); National Museum of Natural History, Smithsonian Institution, Washington D.C. (USNM); and Universidade Santa Úrsula, Rio de Janeiro (USU).

ABBREVIATIONS USED INCLUDES

- CB Blake trawl;
CP beam trawl;
cl carapace length (measured from the orbital margin to the posterior margin of the carapace);
mm millimetres;
mxp3 third maxilliped.

LIST OF STATIONS

For a map showing location of the oceanographic stations conducted by the *Marion Dufresne* in southeastern Brazil, see Tavares 1999.

Stn 4 CP07, 21°31'S, 40°40'W, 750-785 m, *Heterocarpus inopinatus* n. sp., *Acanthephyra eximia*; stn 34 CP56, 20°34'S, 28°19'W, 5092-4990 m, *Heterogenys microphthalmia*; stn 39 CP68, 18°55'S, 37°49'W, 1220 m, *Heterocarpus inopinatus* n. sp., *H. oryx*; stn 43 CB77, 19°00'S, 37°47'W, 900-790 m, *Heterocarpus inopinatus* n. sp., *H. oryx*; stn 44 CB78, 18°58'S, 37°48'W, 1200 m, *Heterocarpus inopinatus* n. sp.; stn 55 CP95, 19°38'S, 38°43'W, 960 m, *Heterocarpus inopinatus* n. sp., *H. dorsalis*, *H. oryx*, *Acanthephyra eximia*; stn 65 CB106, 23°54'S, 42°10'W, 830 m: *H. oryx*.

Family PANDALIDAE Haworth, 1825

Heterocarpus inopinatus n. sp.
(Fig. 1A-D)

TYPE MATERIAL. — TAAF MD55/Brazil 1987, *Marion Dufresne*, stn 55 CP95, 19°38'S, 38°43'W, 960 m, 30.V.1987, ♂ holotype cl 36 mm (MNRJ-7307), 2 ♂♂, 1 ♀, 1 juvenile paratype (MNHN-Na 13562), 4 ♂♂ paratypes (USNM), 2 ♂♂, 2 ♀♀ paratypes (RMNH), 2 ♂♂, 2 ♀♀ paratypes (USU-1317). — Stn 39 CP68, 18°55'S, 37°49'W, 1220 m, 26.V.1987, 2 ♂♂, 3 juveniles paratypes (USU-1310). — Stn 44 CB78, 18°58'S, 37°48'W, 1200 m, 27.V.1987, 1 ovigerous ♀ paratype (USU-1312). — Stn 43 CB77, 19°00'S, 37°47'W, 900-790 m, 27.V.1987, 4 ♂♂ paratypes (USU-1313). — Stn 4 CP07, 21°31'S, 40°40'W, 750-785 m, 10.V.1987, 1 ovigerous ♀ paratype (USU-1315).

TYPE LOCALITY. — Southeastern Brazil, 19°38'S, 38°43'W, 960 m depth.

DISTRIBUTION. — Known so far only from southeastern Brazil, 750 to 1220 metres depth.

ETYMOLOGY. — From the Latin word *inopinatus*, unexpected.

DIAGNOSIS. — Rostrum markedly shorter than the carapace in adults (for instance female USU 1312 cl 40 mm), slightly longer than the carapace in juveniles (for instance juvenile USU-1310 cl 24 mm); usually armed with 9-11 teeth extending to anterior end of rostrum and including 5-6 on carapace posterior to level of orbital margin, and ventrally with 7-9 teeth; last tooth posterior to level of orbital margin strongly reduced. Carapace with well-developed postorbital and branchiostegal carinae, branchiostegal spine usually slightly shorter than antennal spine, sometimes as long as. Antennal scale about 1.5 shorter than carapace length, blade far overreaching distolateral spine. Abdomen without dorsal carina on two anterior somites. Third, fourth, and fifth somites carinate and armed with posteromedian tooth, sixth dorsally depressed. Pleura of fourth and fifth abdominal somites with postventral spine. Short but distinct exopod on the third maxilliped (occasionally at only one mxp3). Pereopods with 22-27 articles in carpus of longer second pair, 8-9 in shorter; pereopods with dactyl of third pair about 2.6 as long as propodus; carpus of each of three posterior pairs unarmed; merus of first and second pereopods unarmed, armed with 9-14 spines on third, 9-12 spines on fourth and 7-12 spines on fifth; ischium with two spines on third and fourth, none on fifth; carapace length of largest specimen 44 mm.

REMARKS

Usually, the species of *Heterocarpus* present the third maxilliped with a well-developed exopod. Of the 22 known species of the genus, *H. oryx* A. Milne-Edwards, 1881, *H. vicarius* Faxon, 1893, and *H. reedi* Bahamonde, 1955, have no exopodite on the third maxilliped at all. Three species present a short but distinct exopod on the third maxilliped, *H. dorsalis* Bate, 1888, *H. affinis* Faxon, 1893, and *H. hostilis* Faxon, 1893. *Heterocarpus inopinatus* n. sp. is among the *Heterocarpus* with a short but distinct exopod on the third maxilliped. It can be promptly distinguished from the three species above as follows: (1) from *H. affinis* by the absence of incision on the dorsal carina of the third abdominal segment (carina distinctly incised in *H. affinis*); (2) from *H. hostilis* by the lateral carinae on the carapace well defined (no distinct lateral carinae in *H. hostilis*); (3) and from *H. dorsalis* by the carapace with dorsal carina unarmed on posterior one third of length (posterior two thirds in *H. dorsalis*). Additionally, in *H. inopinatus* the rostrum is distinctly shorter than the carapace, whereas in *H. dorsalis* it is about the same length as the carapace in large adults (rostrum much longer than the carapace in juveniles); comparatively *H. inopinatus* presents a much heavier body.

Heterocarpus dorsalis Bate, 1888
(Figs 2; 3)

Heterocarpus dorsalis Bate, 1888: 630. — Chace 1985: 22. — Crosnier 1988: 62.

MATERIAL EXAMINED. — TAAF MD55/Brazil 1987, *Marion Dufresne*, stn 55 CB95, 19°38'S, 38°43'W, 960 m, 30.V.1987, 1 ♂ cl 28 mm (USU-1308).

COMPARATIVE MATERIAL. — Apia, western Samoa, 470 m, 5-16.IX.1980, 1 ovigerous ♀ cl 28 mm (RMNH 35173).

DISTRIBUTION. — Southwestern Atlantic (this report), eastern Africa to Indonesia, Philippines, Japan, New Caledonia, and western Samoa, from 185 to 1400 metres depth.

REMARKS

This is the first record of *H. dorsalis* from the

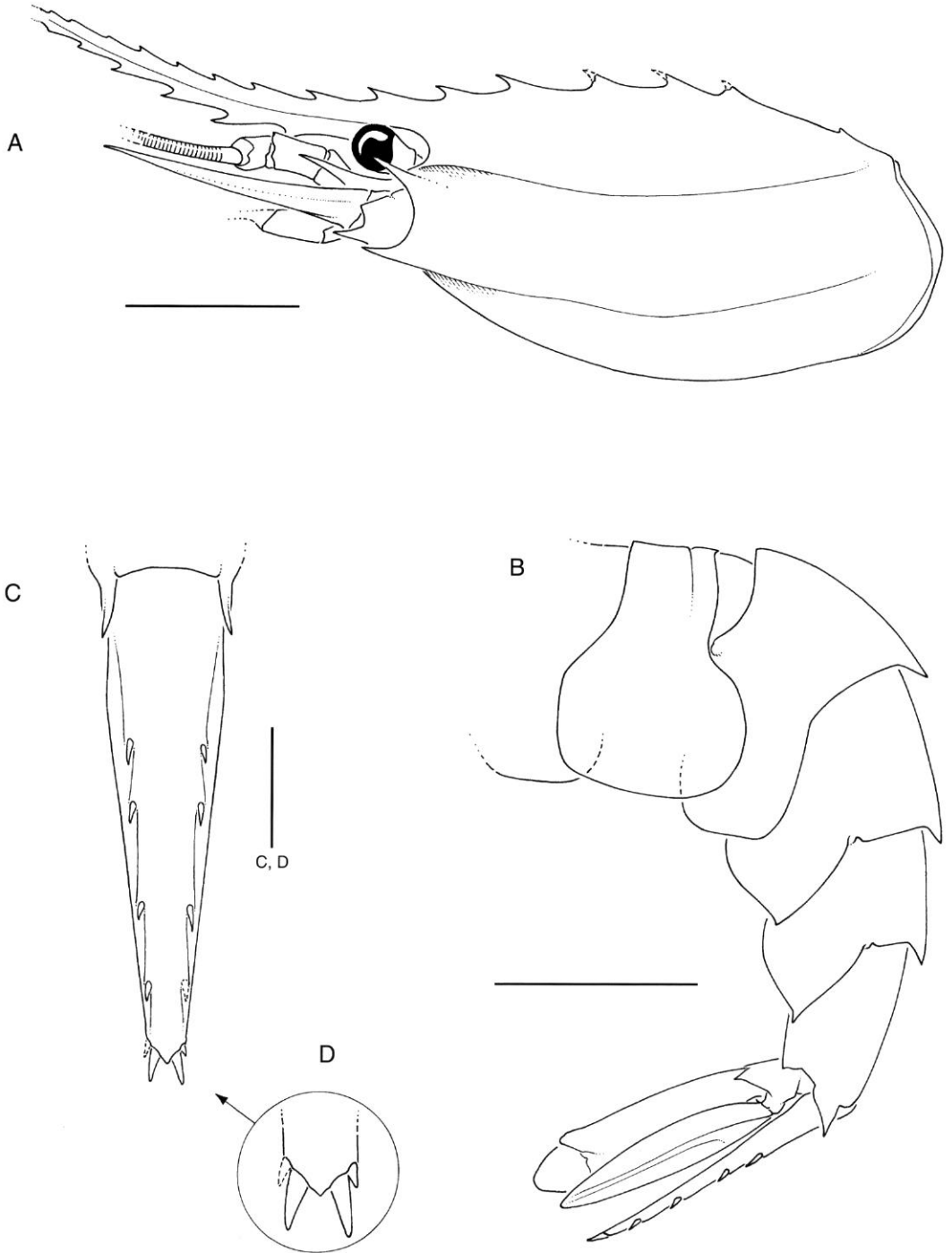


FIG. 1. — **A-D**, *Heterocarpus inopinatus* n. sp. TAAF MD55/Brazil 1987, Marion Dufresne, stn 55 CP95, 19°38'S, 38°43'W, 960 m, 30.V.1987, ♂ holotype cl 36 mm (MNRJ-7307); **A**, lateral profile of carapace; **B**, abdomen, left view (first segment partially represented); **C**, telson, dorsal view; **D**, detail of posterior margin of telson. Scale bars: A, 15 mm; B, 14 mm; C, 4 mm; D, 8 mm.



FIG. 2. — *Heterocarpus dorsalis* Bate, 1888. TAAF MD55/Brazil 1987, Marion Dufresne, stn 55 CB95, 19°38'S, 38°43'W, 960 m, 30.V.1987, ♂ cl 28 mm (USU-1308). Lateral profile of carapace. Scale bar: 15 mm.

Atlantic Ocean. The species is known from numerous localities in the Indo-West Pacific. Chace (1985) and Crosnier (1988) made a detailed report on the variation of *H. dorsalis*. In all respects the Atlantic specimen falls within the limits of variation of *H. dorsalis*.

***Heterocarpus oryx* A. Milne-Edwards, 1881**

Heterocarpus oryx A. Milne-Edwards, 1881: 10. — Pequegnat 1970: 85. — Chace 1985: 21 [key]. — Crosnier 1988: 91 [key].

MATERIAL EXAMINED. — TAAF MD55/Brazil 1987, Marion Dufresne, stn 55 CP95, 19°38'S, 38°43'W, 960 m, 30.V.1987, 11 ♂♂, 3 ♀♀ (USU-1318). — Stn 39 CP68, 18°55'S, 37°49'W, 1220 m, 26.V.1987, 2 ♂♂, 1 ♀ (USU-1309). — Stn 65 CB106, 23°54'S, 42°10'W, 830 m, 2.VI.1987, 1 ♂ (USU-1311). — Stn 43 CB77, 19°00'S, 37°47'W, 900-790 m, 27.V.1987, 1 ♂ (USU-1314).

COMPARATIVE MATERIAL. — Florida Keys, TAAF MD55/Brazil 1987, Gerda, stn 372, 23°51'N, 81°02'W-24°04'N, 80°42'W, 1107-1102 m, 16.IX.1964, 1 ♂ cl 24 mm (RMNH 22388), L. B. Holthuis det.

DISTRIBUTION. — Western Atlantic from the Gulf of Mexico to Southeastern Brazil (this report).

REMARKS

Besides *H. inopinatus* n. sp., *H. dorsalis*, and *H. oryx*, a fourth species occurs in the south-western Atlantic, *H. ensifer* A. Milne-Edwards, 1881 (Bullis & Thopmson 1965; Pequegnat 1970 and Ramos-Porto & Coelho 1998). *H. ensifer* can be readily separated from the remaining south-western Atlantic species by the presence in the

lateral wall of the carapace of a cardiolateral carina dorsal to the postorbital carina.

Oplophoridae Dana, 1852

***Acanthephyra eximia* Smith, 1884**

Acanthephyra eximea Smith, 1884: 376 [*eximia* on p. 377].

Acanthephyra edwardsii Bate, 1888: 747, pl. 126 [type locality: off Aracajú, northeastern Brazil, 10°46'S, 36°08'W, 1386 m].

Acanthephyra edwardsi — Moreira 1901: 10 [species list].

Acanthephyra eximia — De Man 1920: 44. — Coelho & Ramos 1972: 143. — Crosnier & Forest 1973: 34. — Chace 1986: 18.

MATERIAL EXAMINED. — TAAF MD55/Brazil 1987, Marion Dufresne, stn 55 CB95, 19°38'S, 38°43'W, 960 m, 30.V.1987, 1 ovigerous ♀ cl 38 mm (USU-1320). — Stn 4 CP07, 21°31'S, 40°07'W, 750-

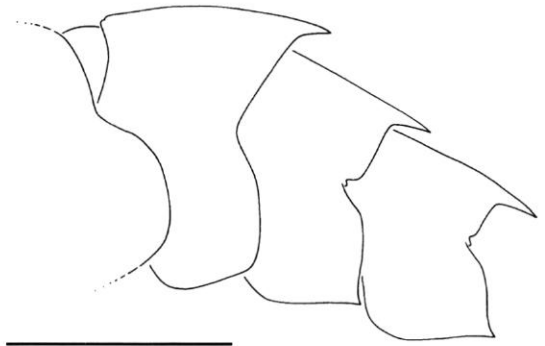


FIG. 3. — *Heterocarpus dorsalis* Bate, 1888 (USU-1308). Abdominal segments third to fifth (second segment partially represented). Scale bar: 10 mm.

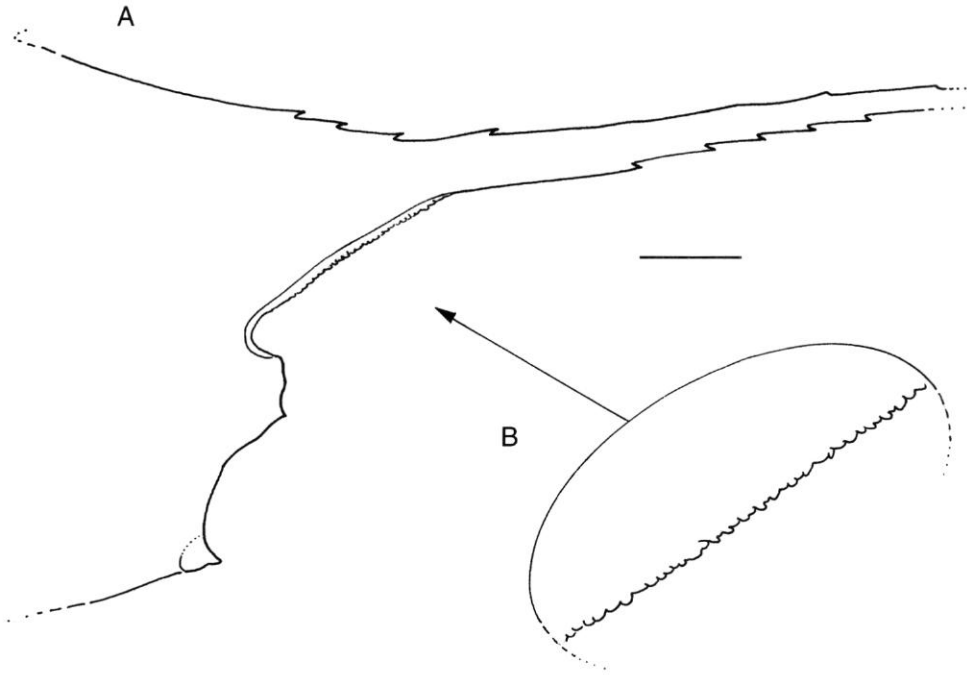


FIG. 4. — *Heterogenys microphthalmal* (Smith, 1885). TAAF MD55/Brazil 1987, *Marion Dufresne*, stn 34 CP56, 20°34'S, 28°19'W, 5092-4990 m, 21.V.1987, damaged specimen, about cl 27 mm (USU-1321); **A**, lateral profile of carapace; **B**, notice detail of ornamentation on the inferior margin of rostrum. Scale bar: A, 3 mm; B, 2 mm.

785 m, 10.V.1987, 1 ♂ cl 44 mm (USU-1319).

COMPARATIVE MATERIAL. — Canary Islands, south-east of Lanzarote, stn CANCAP 4.055, 28°45'N, 13°20'W, 1209-1338 m, 18.V.1980, 1 ovigerous ♀ cl 37 mm (RMNH 37993).

DISTRIBUTION. — *A. eximia* is a widespread species inhabiting depths between 200 and more than 4700 metres. Western Atlantic: from Cap Hatteras to Bahamas, Gulf of Mexico (Crosnier & Forest 1973), off Aracajú (Bate 1888: 747), Belmonte, Bahia (*Albatross* stn 2761, 15°39'S, 38°32'54"W, 1472 m, Crosnier & Forest 1973: 36), and Rio de Janeiro (this report). Eastern and Central Atlantic: Gulf of Gasconne, Açores, Bay of Cadix, near Gibraltar, Canary Islands, and Madeira Archipelago (Crosnier & Forest 1973). Indo-Pacific: from South and Eastern Africa to Japan, Hawaii, and the Erben seamount about 650 miles off California (Chace 1986).

Heterogenys microphthalmal (Smith, 1885)
(Fig. 4)

Acanthephyra microphthalmal Smith, 1885: 502. — Crosnier & Forest 1973: 42.

Heterogenys microphthalmal. — Chace 1986: 38 [new combination].

MATERIAL EXAMINED. — TAAF MD55/Brazil 1987, *Marion Dufresne*, stn 34 CP56, 20°34'S, 28°19'W, 5092-4990 m, 21.V.1987, 1 damaged specimen about cl 27 mm (USU-1321).

COMPARATIVE MATERIAL. — Madeira Archipelago, Porto Santo, stn CANCAP 4.180, 32°48'N, 16°18'W, 3315-3499 m, 9-10.VI.1980, 1 ♂ cl 27 mm (RMNH 37994).

DISTRIBUTION. — This is the first record of *H. microphthalmal* from the southwestern Atlantic (20°34'S, 28°19'W). The species was previously known from Bay of Bengal, Senegal, Celebes Sea, off Japan, south of Tuamotu Archipelago, west of Oregon, and western and eastern North Atlantic (Crosnier & Forest 1973: 43; Chace 1986: 38), between 2000 and 5092 m depth.

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