

**GNATHIIDAE (CRUSTACEA, ISOPODA) FROM THE ANDAMAN SEA, THAILAND:
NEW RECORDS AND A NEW SPECIES****Jörundur Svavarsson***Institute of Biology, University of Iceland, Grensásvegur 12, 108 Reykjavík, Iceland***ABSTRACT**

Gnathiid isopods (Crustacea) were collected during BIOSHELF cruises in shallow waters in the Andaman Sea around Phuket Island, Thailand. Three species of gnathiids are recorded: *Gnathia alces* Monod, 1926, *Gnathia mortenseni* Monod, 1926 and *Caecognathia andamanensis* sp. nov. *G. alces* and *G. mortenseni* have previously been reported from Thai waters. *Caecognathia andamanensis* is characterised by the semi-pentagonal shape of the cephalosome, the shape of the uropods and in the absence of large projections on the anterior faces of ischium to carpus of the pereopods. It is most closely related to a group of species only known in Australian waters, in particular to *C. branchyponera* Cohen and Poore, 1994. *C. andamanensis* was found at depths between 40 and 82 m on sandy mud or muddy sand bottoms.

INTRODUCTION

Gnathiid isopods are remarkable animals, both in terms of their morphology and their peculiar way of living. There is an extreme sexual dimorphism among the gnathiids, the adult males differing hugely from the juveniles and the females. Juvenile gnathiids (the praniza stage) have piercing mouthparts (see Svavarsson, 1999; Smit *et al.*, 1999) and are micro-predators of fish. These are regarded by some authors as possibly the most common parasites of coral-reef fish (Monod, 1926; Grutter, 1996; 1999). Between feeding trips the pranizas rest together with the adults in sponge oscular cavities, in crevices on coral reefs or in cavities in the bottom sediments (Upton, 1987; Klitgaard, 1997). In some cases the males guard 'harems' of up to 25 females in cavities in the bottom (Upton, 1987).

There are about 160 species of gnathiids in ten genera known from the world oceans (Cohen and Poore, 1994; Schotte, 1995; Pires, 1996; Ortiz and Lalana, 1997). Though many species have been reported from the tropics (Holdich and Harrison,

1980; Müller, 1989a; 1989b; 1989c; 1993) only three species have been reported from Thailand — *Gnathia alces* Monod, 1926, *Gnathia mortenseni* Monod, 1926 and *Elaphognathia rangifer* (Monod, 1926). This paper reports on a recent collection of shallow-water gnathiids from the DANIDA sponsored BIOSHELF cruises in shallow waters off Phuket Island, Thailand.

MATERIALS AND METHODS

The material was collected during the BIOSHELF program conducted in the Andaman Sea, at depths between 17 and 927 m, though most of the samples were taken at depths shallower than 100 m. Samples were collected using a Ockelmann sledge (OS).

Terminology follows Cohen and Poore (1994). The material is deposited at the Reference Collection, Phuket Marine Biological Centre (PMBC), Phuket, Thailand, the Zoological Museum, University of Copenhagen (ZMUC), Denmark and the Icelandic Museum of Natural History (IMNH), Reykjavík, Iceland.

TAXONOMY**Family Gnathiidae*****Gnathia* Leach****Restricted synonymy**

Cohen and Poore, 1994: 343.

Type species

Gnathia termitoides Leach, 1814.

Diagnosis (from Cohen and Poore, 1994)

Eyes usually present. Frontal margin of cephalon generally transverse, with frontal processes. Mandibles usually with dentate mandibular blade and mandibular incisor. Cephalon may possess paraocular ornamentation and/or a dorsal sulcus. Pereonite 1 immersed in cephalon. Pylopod 2- or 3-articulated; operculate, article 1 enlarged, generally with dense external margin of plumose setae; article 3 small or absent.

***Gnathia alces* Monod, 1926**

Gnathia alces Monod, 1926: 493–496, figs 216–217.– Cohen and Poore, 1994: 288, table 4.

Material examined

PMBC 14943, 6 males, BIOSHELF St. F2, 08°15'N, 098°03'E, 66 m, OS, coll. S. Bussarawit and C. Aungtonya, 16.02.1998; PMBC 14944 and IMNH 2000.09.07.1, 35 males, 5 females, 30 juveniles, BIOSHELF St. G1, 08°00'N, 098°12'E, 49 m, OS, coll. S. Bussarawit and C. Aungtonya, 20.02.1998; PMBC 14945, 1 male, BIOSHELF St. G2, 07°59'N, 098°08'E, 70 m, OS, coll. S. Bussarawit and C. Aungtonya, 20.02.1998; PMBC 14946, 3 males, BIOSHELF St. H1, 07°45'N, 098°16'E, 31 m, OS, coll. S. Bussarawit and C. Aungtonya, 20.02.1998; PMBC 14947, 1 male, BIOSHELF St. I2, 07°30'N, 098°30'E, 59 m, OS, coll. S. Bussarawit and C. Aungtonya, 22.02.1998; PMBC 14948 and IMNH 2000.09.07.2, 18 males, 5 juveniles, BIOSHELF St. I2–I3, 07°33'N, 098°19'E, 55 m, OS, coll. S. Bussarawit and C. Aungtonya, 22.02.1998; PMBC 14949, 9 males, 1

juvenile, BIOSHELF St. I3, 07°35'N, 098°16'E, 69 m, OS, coll. S. Bussarawit and C. Aungtonya, 22.02.1998; PMBC 14950, 1 male, BIOSHELF St. J3, 07°15'N, 098°36'E, 77 m, OS, coll. S. Bussarawit and C. Aungtonya, 23.02.1998; PMBC 14951, 2 males, BIOSHELF St. K3, 07°02'N, 098°50'E, 75 m, OS, coll. S. Bussarawit and C. Aungtonya, 22.02.1998; PMBC 14952, 1 male, BIOSHELF St. NBC, 07°42'N, 098°24'E, 45 m, coarse sand, OS, coll. G. Dinesen, 03.12.1997; PMBC 14953, 1 male, BIOSHELF St. PB3, 07°51'N, 098°34'E, 28 m, OS, coll. S. Bussarawit and C. Aungtonya, 21.02.1998; PMBC 14954, 2 males, BIOSHELF St. PB6, 07°44'N, 098°33'E, 34 m, OS, coll. S. Bussarawit and C. Aungtonya, 21.02.1998; PMBC 14955, 5 males, BIOSHELF St. PB7, 07°44'N, 098°41'E, 35 m, OS, coll. S. Bussarawit and C. Aungtonya, 21.02.1998.

Remarks

Gnathia alces shows considerable variation in the shape of the mandible. This is particularly evident in the relative length of the mandible blade, becoming quite long and slender and even distinctly curved in the largest males. Monod (1926) illustrates this for a number of his specimens (his figure 216a–c).

Monod (1926) reported *Gnathia alces* from the Gulf of Thailand (Gulf of Siam) and from Singapore, at depths of 9 to 15 m. The present material is from depths of 27 to 77 m in the Andaman Sea and when the sediments have been noted (Station C2), these were coarse sand.

***Gnathia mortenseni* Monod, 1926**

Gnathia mortenseni Monod, 1926: 498–502, figs 219–221.– Cohen and Poore 1994: 388, table 4.

Material examined

PMBC 14956 and IMNH 2000.09.07.03, 5 males, 2 females, 3 juveniles, BIOSHELF St. NBC, 07°43'N, 098°24'E, 45 m, coarse sand, OS, coll. N. Bruce and G. Dinesen, 03.12.1997; PMBC 14957, 1 male, BIOSHELF St. NBD, 07°45'N, 098°25'E, 40 m, coarse sand, OS, coll. N. Bruce

and G. Dinesen, 09.12.1997; IMNH 2000.09.07.2, 1 male, BIOSHELF St. E1, 08°30'N, 098°06'E, 42 m, muddy sand, OS, coll. S. Bussarawit and C. Aungtonya, 22.04.1996; PMBC 14959, 1 male, BIOSHELF St. PB6, 07°44'N, 098°33'E, 34 m, OS, coll. S. Bussarawit and C. Aungtonya, 21.02.1998; PMBC 14960, 1 male, BIOSHELF St. PB7, 07°44'N, 098°41'E, 35 m, OS, coll. S. Bussarawit and C. Aungtonya, 21.02.1998.

Remarks

Monod (1926) reported *Gnathia mortenseni* from five locations in the Gulf of Thailand (Gulf of Siam) at depths between 18 and 55 m. The present specimens were collected on coarse or muddy sand at depths between 34 and 45 m.

Caecognathia Dollfus

Type species

Anceus stygius Sars, 1877.

Diagnosis (from Cohen and Poore, 1994)

Frontal margin of cephalon produced, without frontal processes. Mandible usually with a smooth mandibular blade. Cephalon without paraocular ornamentation or dorsal sulcus. Pereonite 1 immersed in cephalon. Pylopod 2- or 3-articulated, operculate, article 1 enlarged, article 3 small or absent.

Caecognathia andamanensis sp. nov. (figs 1–4)

Material examined

Holotype: PMBC 14941, Male, 2.5 mm, BIOSHELF St. I2, 07°30'N, 098°30'E, 59 m, OS, coll. S. Bussarawit and C. Aungtonya, 22.02.1998.

Paratypes: PMBC 14961, 1 male, BIOSHELF St. E2, 08°31'N, 098°00'E, 60 m, sandy mud, OS, coll. S. Bussarawit and C. Aungtonya, 22.04.1996; PMBC 14962 1 male, BIOSHELF St. E3, 08°30'N, 097°46'E, 81 m, sandy mud, OS, coll. S. Bussarawit and C. Aungtonya, 22.04.1996; PMBC 14963, 1 male, BIOSHELF St. K3, 06°59'N, 098°42'E, 82 m, sandy mud, OS, coll. S.

Bussarawit and C. Aungtonya, 05.05.1996; PMBC 14964, 3 males, BIOSHELF St. B1, 09°14'N, 098°00'E, 45 m, OS, coll. S. Bussarawit and C. Aungtonya, 17.02.1998; PMBC 14965, 1 male, 1 juvenile, BIOSHELF St. C1, 09°00'N, 098°02'E, 41 m, OS, coll. S. Bussarawit and C. Aungtonya, 17.02.1998; PMBC 14966 and IMNH 2000.09.07.4, 20 males, BIOSHELF St. C2, 09°00'N, 097°56'E, 60 m, OS, coll. S. Bussarawit and C. Aungtonya, 17.02.1998; PMBC 14967, 1 male, BIOSHELF St. F2, 08°15'N, 098°03'E, 66 m, OS, coll. S. Bussarawit and C. Aungtonya, 16.02.1998; PMBC 14968, 8 males, 1 juvenile, BIOSHELF St. H1, 07°45'N, 098°16'E, 35 m, coll. S. Bussarawit and C. Aungtonya, 20.02.1998; PMBC 14942 and ZMUC-CRU 3680, 30 males, BIOSHELF St. I2, 07°30'N, 098°30'E, 59 m, OS, coll. S. Bussarawit and C. Aungtonya, 22.02.1998; PMBC 14969, 13 males, BIOSHELF St. I3, 07°35'N, 098°16'E, 69 m, OS, coll. S. Bussarawit and C. Aungtonya, 22.02.1998; PMBC 14970, 11 males, BIOSHELF St. J1, 07°15'N, 099°04'E, 40 m, OS, coll. S. Bussarawit and C. Aungtonya, 23.02.1998; PMBC 14971, 5 males, 1 female, BIOSHELF St. J2, 07°15'N, 098°48'E, 63 m, OS, coll. S. Bussarawit and C. Aungtonya, 23.02.1998; PMBC 14972, 3 males, 1 juvenile, BIOSHELF St. J3, 07°15'N, 098°36'E, 77 m, OS, coll. S. Bussarawit and C. Aungtonya, 23.02.1998; PMBC 14973 and IMNH 2000.09.07.5, 26 males, BIOSHELF St. K2, 07°00'N, 099°04'E, 53 m, OS, coll. S. Bussarawit and C. Aungtonya, 24.02.1998; PMBC 14974, 27 males, BIOSHELF St. K3–K2, 07°02'N, 098°50'E, 76 m, OS, coll. S. Bussarawit and C. Aungtonya, 24.02.1998; PMBC 14975, 10 males, BIOSHELF St. L2, 06°43'N, 099°03'E, 61 m, OS, coll. S. Bussarawit and C. Aungtonya, 25.02.1998.

Description

Body length 2.2–2.6 mm. Body about 3.6 times as long as wide (Fig. 1A). Cephalosome (Fig. 1A–C) semi-pentagonal, about 1.3 times as wide as long. Frontal border produced, rounded, 4–5 slender submarginal setae on each side of mid-dorsal line. External scissura angular. Supraocular lobe fairly angular. Eyes well developed, lateral and sessile. Pereon widest at pereonites 5 and 6, about 1.2 times as wide as cephalosome. Pereonite 1

immersed in cephalon, not reaching lateral margin dorsally and partially obscured laterally by pereonite 2; anterior constriction of pereonite 4 pronounced; pereonites 5 and 6 evenly rounded, junction of pereonite 5 and 6 not visible dorsally in fully adult males, clearly visible in subadult males; pereonite 6 with rounded globular lobii; pereonite 7 narrow, overlapping pleon. Pleonites (Fig. 1D) subequal, epimeria prominent, fine row of setae posteriorly on all pleonites.

Antenna 1 (Fig. 2A) short, smaller than antenna 2; second and third articles of peduncle with few plumose setae distally. Flagellum with 5 articles; about 1.8 times as long as article 3 of peduncle; few fine setae on distal articles.

Antenna 2 (Fig. 2A) peduncle 3 and 4 with few long, plumose setae distally; flagellum with 7 articles.

Mandible (Fig. 1B) about 0.3 times as long as cephalon width, strongly curved, with unarmed

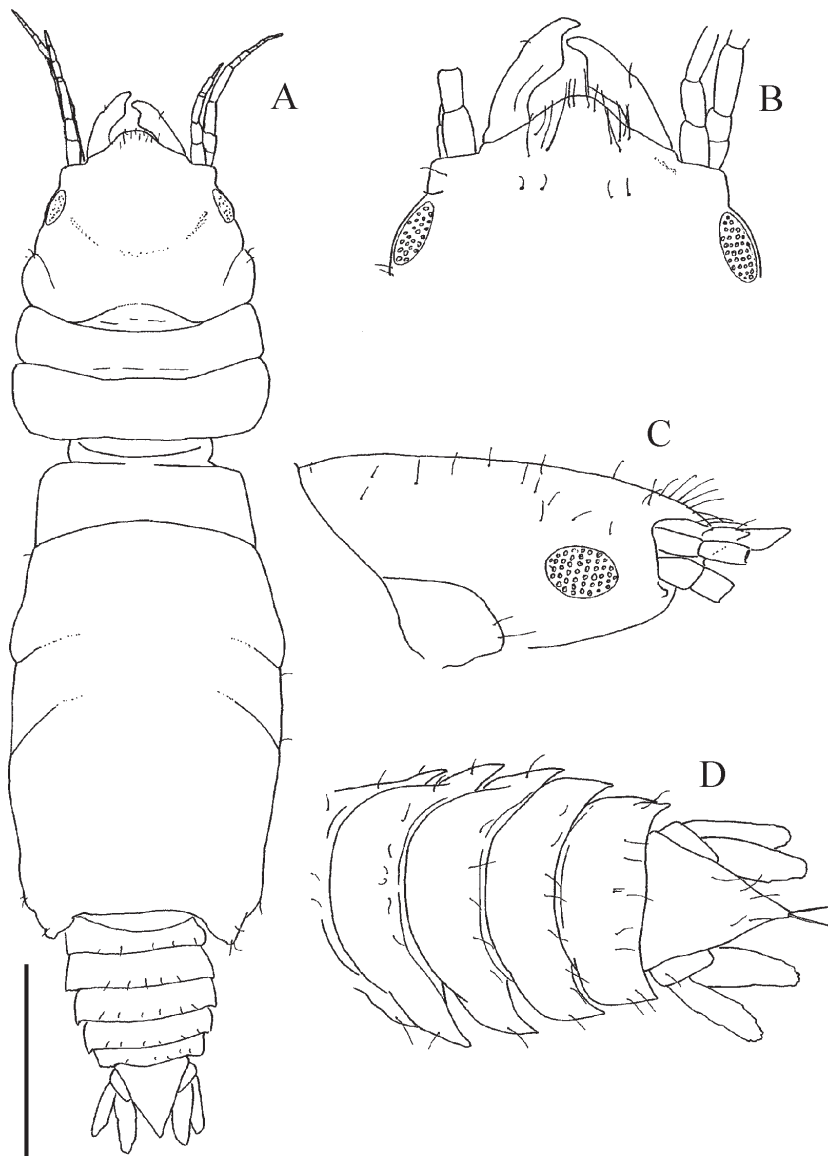


Figure 1 *Caecognathia andamanensis* sp. nov. Male paratype, 2.6 mm, BIOSHELF St. I2. A. Body; B. Anterior margin of cephalosome; C. Cephalosome, lateral view; D. Pleonites and pleotelson. Scale: 0.5 mm.

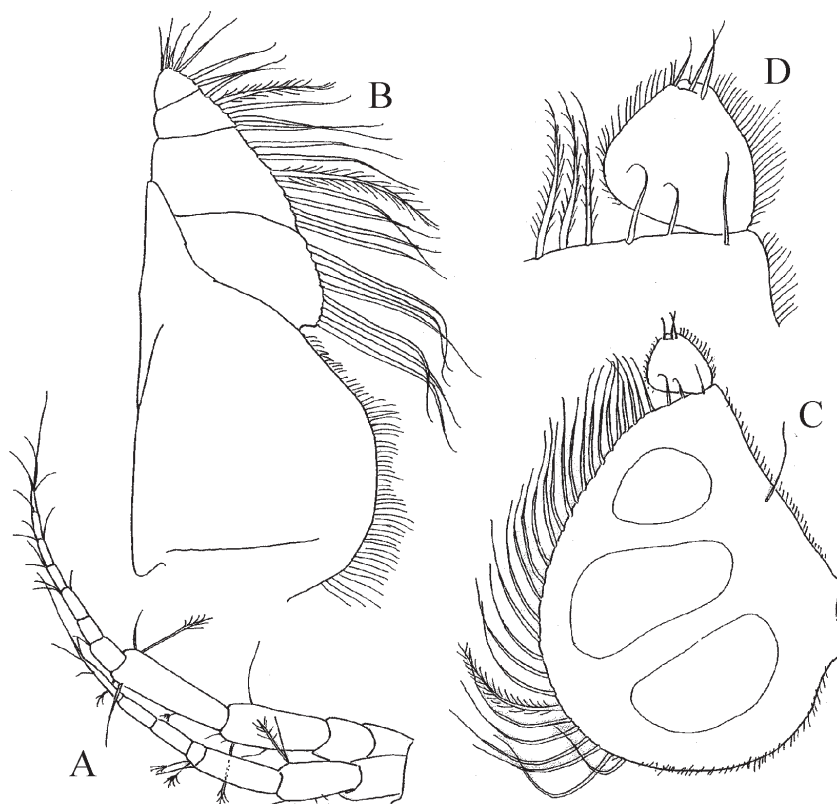


Figure 2 *Caecognathia andamanensis* sp. nov. Male paratype, 2.6 mm, BIOSHELF St. I2. A. Antenna 1 and 2; B. Maxilliped (fine setulose on large setae omitted from large setae); C. Pylopod (fine setulose on large setae omitted from large setae); D. Third article of pylopod.

carina; smooth short blade, with simple seta distal to basal neck.

Maxilliped (Fig. 2B) with 5 articles; external margin of article 1 fringed with fine, small setae; external margins of articles 2–5 with stout plumose setae, 6 on article 2, 7 on article 3, 5 on article 4, around 7 setae on external margin and distally on article 5; endite reaching article 3.

Pylopod (Fig. 2C) with 3 articles, external and internal margins fringed with fine setae; external margin of article 1 with about 30 plumose setae, proximal plumose setae large, distal plumose setae smaller; simple setae present on distal end and on internal margin; second article with fringed with fine setae, few simple setae distally; third article minute (Fig. 2D).

Pereopods 2 (Fig. 3A) and 3 (Fig. 3B) stout, similar in shape; with numerous setae. Propodus of pereopods 2 and 3 with robust serrated seta

medioventrally and ventrodistally; few slender setae dorsally, brush-like seta dorsodistally; propodus of pereopod 2 with cuticular extensions ventrally. Carpus of pereopod 2 and 3 with few slender setae on ventral margin; merus expanded, 1.2 times longer than wide on both pereopods, with many slender setae dorsally and dorsodistally and few slender setae ventrally; ischium of pereopod 2 1.9–2.0 times as long as merus; ischium of pereopod 3 1.7 times as long as merus. Merus of both pereopods with number of long plumose setae dorsodistally. Ventral margin of carpus, merus and ischium of pereopods 2 and 3 with dense cover of fine setae ventrally.

Pereopods 4 (Fig. 3C), 5 (Fig. 4A) and 6 (Fig. 4B) slender, propodus with robust serrated seta medioventrally and ventrodistally; few long and slender setae ventrally on carpus, merus and ischium.

Pleotelson (Fig. 4C) about as longer as wide; few slender setae near distal end; distally 2 setae.

Uropodal (Fig. 4D) peduncle with long plumose seta mediolaterally; endopod about as long as exopod, about 2.5 times longer than wide, fringed with about 6 plumose setae on distomedial margin and on apex, longest plumose setae about 1.3 times as long as endopod, few long simple seta laterodistally, few broom-like setae on dorsal surface near proximal end. Exopod about 3.6 times

as long as wide, fringed with few plumose setae mediolaterally and distally, few simple setae laterally and laterodistally.

Etymology

The name refers to the study area, the Andaman Sea.

Remarks

This species is most closely related to a group



Figure 3 *Caecognathia andamanensis* sp. nov. Male paratype, 2.6 mm, BIOSHELF St. I2. A. Pereopod 2; B. Pereopod 3; C. Pereopod 4.

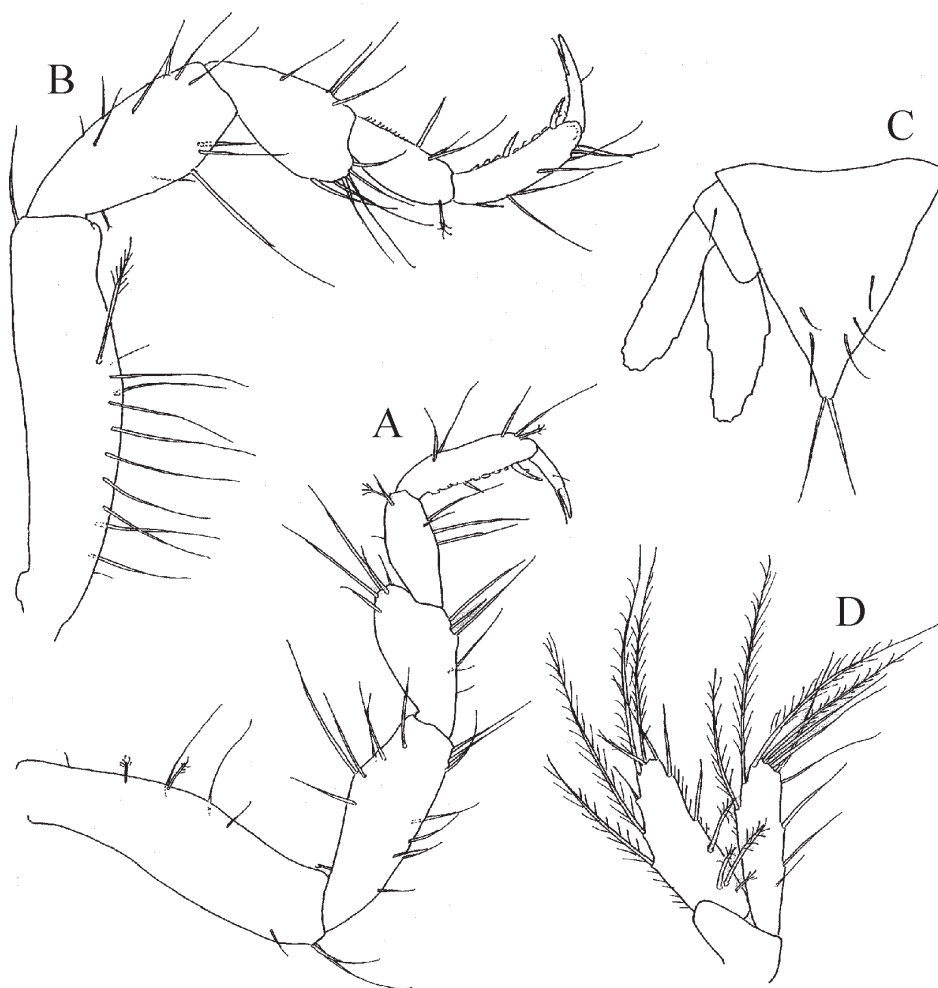


Figure 4 *Caecognathia andamanensis* sp. nov. Male paratype, 2.6 mm, BIOSHELF St. I2. A. Pereopod 5; B. Pereopod 6; C. Pleotelson; D. Uropod.

of species characterised by having simple mandibles, pear-shaped pereon, roughly elliptical cephalosome, presence of globular lobuii and distinct pylopods. This group consists of *C. branchyponera* Cohen and Poore, 1994, *C. leptanilla* Cohen and Poore, 1994, *C. trachymesopus* Cohen and Poore, 1994 and *C. diacamma* Cohen and Poore, 1994, all from Australian waters (Cohen and Poore, 1994).

Caecognathia andamanensis is most similar to *C. branchyponera* but can be distinguished by the semi-pentagonal shape of the cephalosome, the shape of the uropods and in the absence of large projections on the anterior faces of ischium to carpus of the pereopods.

The species was found at depths between 40 and 82 m on sandy mud or muddy sand bottoms.

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