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CARIDEAN SHRIMPS (CRUSTACEA, DECAPODA) FROM SEAGRASS HABITATS IN HANSA BAY, PAPUA NEW GUINEA

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ABSTRACT

Five species of caridean shrimps collected from seagrass habitats at Hansa Bay, on the northern coastline of Papua New Guinea are reported. Four species are new to the fauna of Papua New Guinea. Morphological details of *Nikoides danae*, *Latreutes pymoeus* and *L. porcinus* are discussed and compared to previous records. The previously undescribed male secondary sexual appendices of *N. danae* and *L. pymoeus* are described.

INTRODUCTION

Seagrass beds form an important component of tropical and temperate marine ecosystems. The taxonomic composition and ecology of the associated caridean shrimp fauna has been studied in various places within the Indo-Pacific (Japan: Kikuchi, 1966; Madagascar: Ledoyer, 1969; Queensland (Australia): Young & Wadley, 1979; New Caledonia: Ledoyer, 1984) and Atlantic Oceans (Panama: Coen & Heck, 1983; Mexico: Ledoyer, 1986; Florida (USA): Holmquist et al., 1989). Seagrass beds are a prominent element of both intertidal and shallow subtidal regions in numerous locations along the coastline of Papua New Guinea (Johnstone, 1982). Although they

are known to harbour a high number of associated invertebrate and vertebrate species (Brouns & Heijs, 1985), data on the associated caridean shrimp fauna is generally lacking.

The present report deals with a small collection of caridean shrimps obtained from Hansa Bay, Madang Province along the northern coast of Papua New Guinea. Within Hansa Bay various seagrass species form mixed and mono-specific stands, these have been mapped by Bay & Demoulin (1989).

Seagrasses were identified using Brouns (1986). Post-orbital carapace lengths (cl.) are given in mm. All specimens have been deposited in the collections of the 'Koninklijk Belgisch Instituut voor Natuurwetenschappen', Brussels,

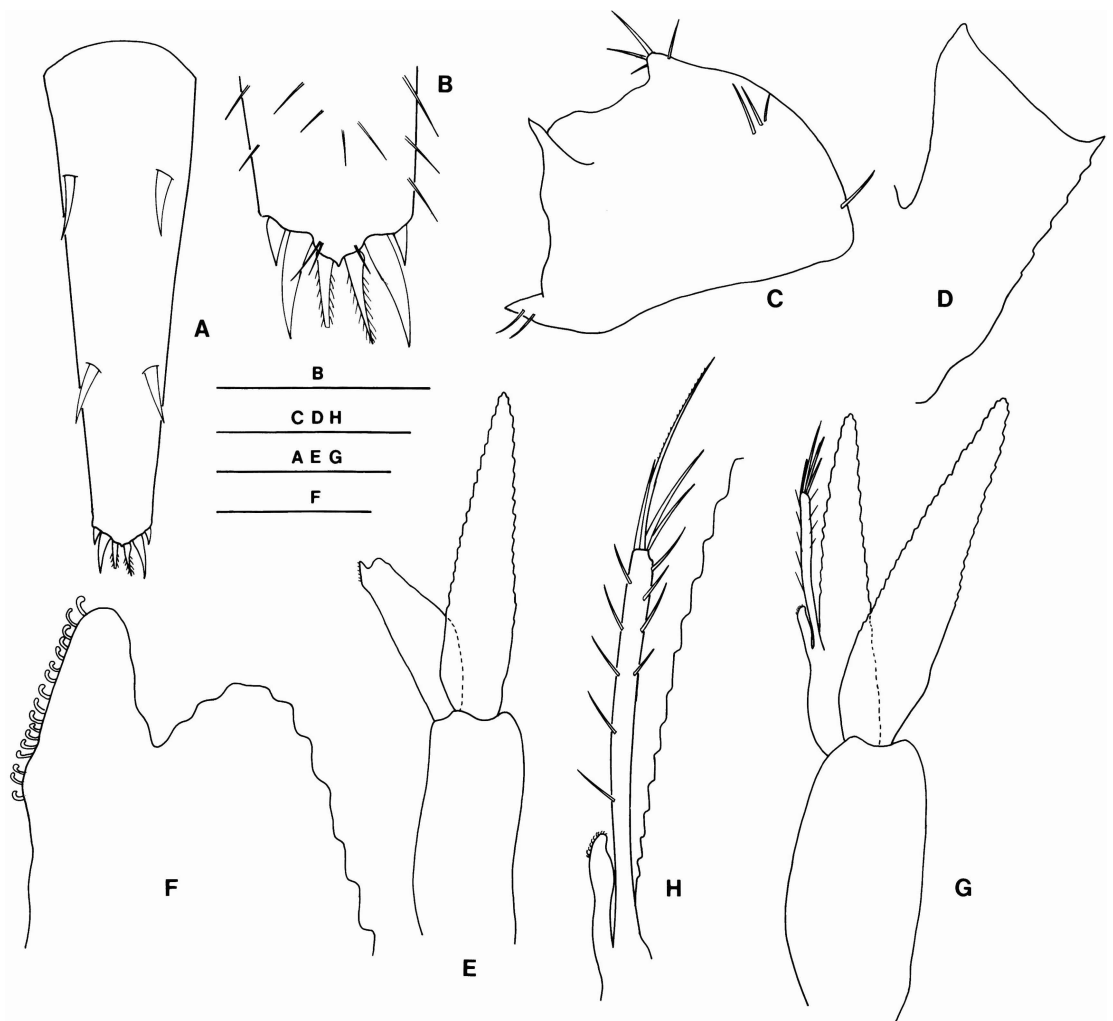


Fig. 1. *Nikoides danae* Paulson, Hansa Bay, Papua New Guinea: telson (a), posterior part of telson (b), right basicerite (c), right stylocerite (d), right first pleopod (e), tip of endopod of first pleopod (f), right second pleopod (g), appendices interna and masculina of second pleopod (h). Scale bars indicate 1.0 mm (a, e, g), 0.5 mm (b, c, d, h) or 0.1 mm (f).

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1978: 20-21, Fig. 10b-c; Ledoyer, 1984: 39, Fig. 20b; Noël, 1985: 263; Hayashi, 1991: 204, Figs. 205a-c, 206c-e.

SYSTEMATICS

Family Processidae

Nikoides danae Paulson, 1875

(Fig. 1)

Restricted synonymy

Nikoides Danae Paulson, 1875: 98, Plate 14 figs. 5-5d.

Nikoides danae; Hayashi, 1975: 53-58, Figs. 1-2; Wadley,

Material examined.- Papua New Guinea, Hansa Bay, in front of Sisimangum village, 19.X. 1993, shrimp-dredge sample in *Syringodium isoetifolium* (Ascherson) Dandy bed, 5-6 m depth, leg. S. De Grave, 1 male (cl. 5.25), KBIN I.G. 28056/NAT9.

Remarks.- Hayashi (1975) used the shape of the fifth abdominal somite, the presence of an apical median spine on the telson, an acutely pointed stylocerite and a basicerite provided with

both a sharply and a bluntly pointed process as the key characteristics in which *N. danae* differs from the other Indo-West Pacific species. Ledoyer (1984) considers the shape of the stylocerite to be the only reliable character, as in his material the shape of the fifth pleuron varied considerably. As regards the stylocerite (Fig. 1d) and basicerite (Fig. 1c) the present single male specimen agrees well with the description and figures provided by Hayashi (1975, 1991). Furthermore the rostral length, its bifid apex and the ischium of the third pereopod furnished with two spines and merus with five also corresponds with Hayashi (1975). Differences lie in the apex of the telson (Fig. 1a, b), being far less developed in the present specimen and the pleuron of the fifth abdominal somite being rounded, not pointed. The species appears to be rather variable in some of the key characters defined by Hayashi (1975), as demonstrated by the present material and the material of Ledoyer (1984) and Noël (1985). The opportunity is taken to describe and figure the male secondary sexual appendices of this species, which have not been previously described.

The endopod of the first pleopod reaches to 0.54 of the exopod (Fig. 1e); tip of exopod is deeply notched and furnished with cincinnuli along the distal mesial part (Fig. 1f); mesial margin of endopod non-setose. Appendix masculina of second pleopod inserted approximately 0.3 along margin of endopod, reaching to 0.78 of endopod length; appendix interna arising just below appendix masculina and reaching to 0.31 of length. Appendix masculina furnished with 5 non-plumose setae along mesial margin, 4 non-plumose setae along distal part of lateral margin, distal margin with three intermediate non-plumose setae and one long serrated seta. Appendix interna sigmoid-shaped, with cincinnuli along mesio-distal margin.

Distribution.- The species is widespread in the Indo-Pacific ranging from East Africa and the Red Sea to Japan and Hawaii (Hayashi, 1975; Nomura et al., 1996). *N. danae* is mainly associated with coral reef environments (Hayashi, 1975), although its occurrence in seagrass beds has previously been noted by Ledoyer (1984) in New Caledonia.

Family Hippolytidae

Latreutes pymoeus Nobili, 1904
(Figs. 2, 3)

Restricted synonymy

Latreutes pymoeus Nobili, 1904: 231.

Latreutes pygmaeus (erroneous spelling of *Latreutes pymoeus*); Nobili, 1906: 37-38, Plate 3, figs. 4-4i; Kemp, 1914: 99-101, Plate 2 figs. 7-8, Plate 3 figs. 1-7; Barnard, 1950: 707, Fig. 131c; Ledoyer, 1969: 70, Plate 6 figs. 1-12, Plate 16A; Ledoyer, 1984: 17-20, Fig. 5; Hayashi, 1994: 97, Fig. 253f.

Material examined.- Papua New Guinea, Hansa Bay, in front of Sisimangum village, 19.X. 1993, shrimp-dredge sample in *Syringodium isoetifolium* (Ascherson) Dandy bed, 5-6 m depth, leg. S. De Grave, 84 specimens (cl. 2.03-3.91), incl. numerous ovigerous females, KBIN I.G. 28056/NAT10.

Remarks.- As regards general carapace spination, rostral morphology, telson spination, antennal scale and the structure of the pereopods (Figs. 2, 3), the present specimens agree quite well with the descriptions by Nobili (1904, 1906), Kemp (1914) and Ledoyer (1969, 1984). The following characteristics appear to have been overlooked in previous descriptions: series of stout plumose setae along the distal margin of the carpus of first pereopod (Fig. 2a); the presence of a single large, movable spine close to the ventro-distal angle of the ischium of third pereopod (Fig. 2c). In some respects minor differences were noted with previous descriptions. The present specimens have four mesial dactylar spines on the third pereopod, compared to two (Ledoyer, 1969), three (Nobili, 1906) or five (Kemp, 1914; Ledoyer, 1984). As differences and variations are also apparent between these descriptions, it is clear that this species is highly variable, as first noted by Nobili (1906). In the present material some variation was noted in the relative development of the median point of the telson and the stoutness and number of terminal telson spines (Fig. 2e, 2j-l). Considerable variation is present in both rostral shape and spination (Fig. 3), both between sexes and within the same sex. Males generally have a more slender and upturned rostral shape (Fig. 3d) than females, although more

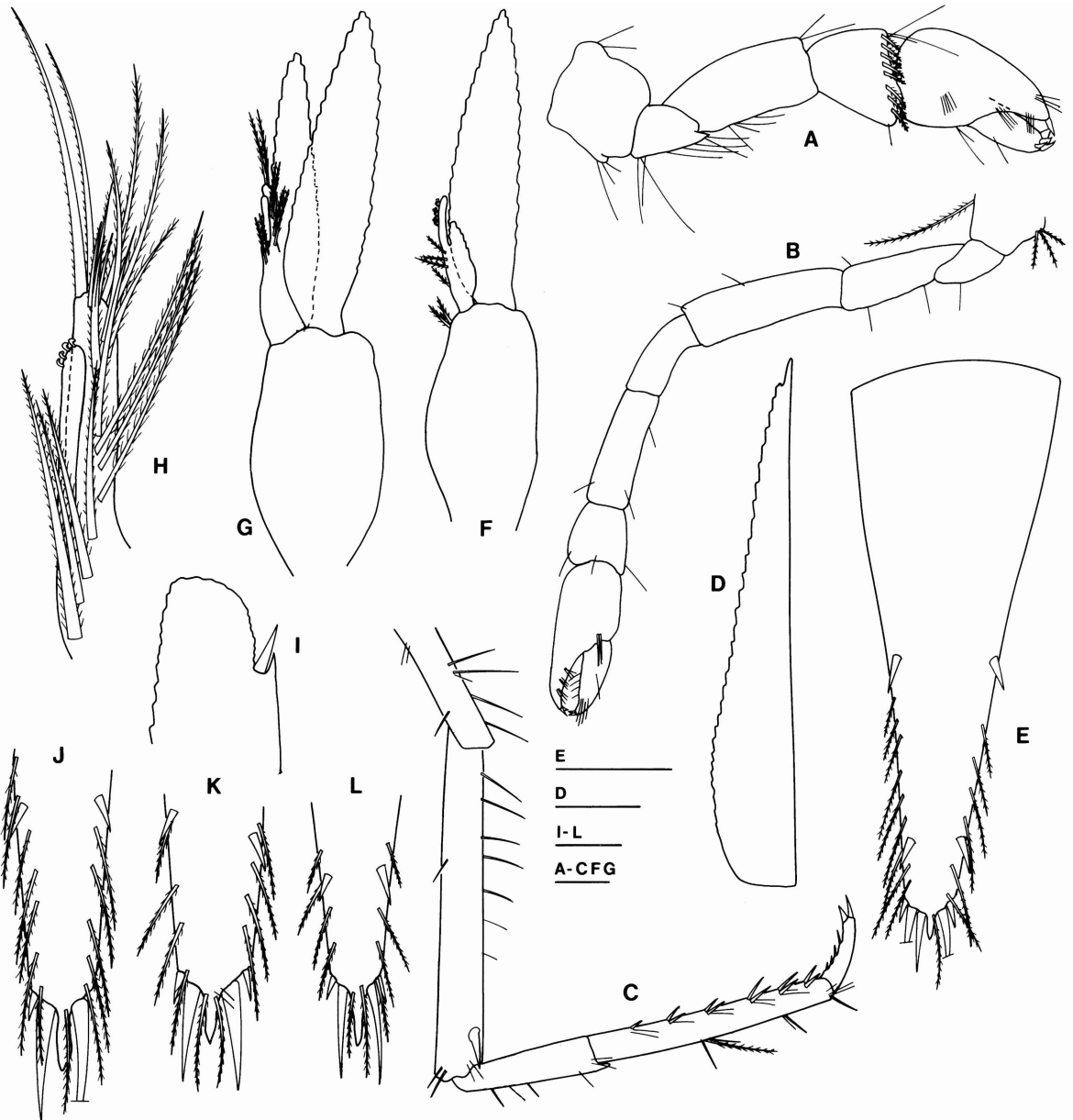


Fig. 2. *Latreutes pymoews* Nobili, Hansa Bay, Papua New Guinea: left first pereiopod (a), left second pereiopod (b), left third pereiopod (c), left antennal scale (d), telson (e), left first pleopod (f), left second pleopod (g), appendices interna and masculina of second pleopod (h), tip of left uropodal exopod (i), posterior part of telson (j, k, l). All ovigerous (ov.) female (cl. 3.40 mm), except j (ov. female cl. 3.80 mm), k (ov. female cl. 3.40 mm) and l (male cl. 2.16 mm). Scale bars indicate 0.5 mm (e), 0.2 mm (i-l; a-c, f-g) or 0.1 mm (h).

robust shapes (Fig. 3g) can also be present. The most abundant rostral shape of females is illustrated in Fig. 3a. In the present material, the number of dorsal teeth varies from 0 to 3 and ventral teeth from 2 to 4, with the most common combinations being 2/4 in females and 0-1/2 in males. This corresponds to the variations found by Nobili (1906) and Kemp (1914). The opportu-

nity is taken to describe and figure the male secondary sexual appendices of this species, which have not been previously described. Male first pleopod (Fig. 2f) with endopod reaching to 0.29 of exopod, furnished with appendix interna, appendix interna overreaches endopod and furnished with cincinnuli along distal half. Male second pleopod (Fig. 2g) with endopod approxi-

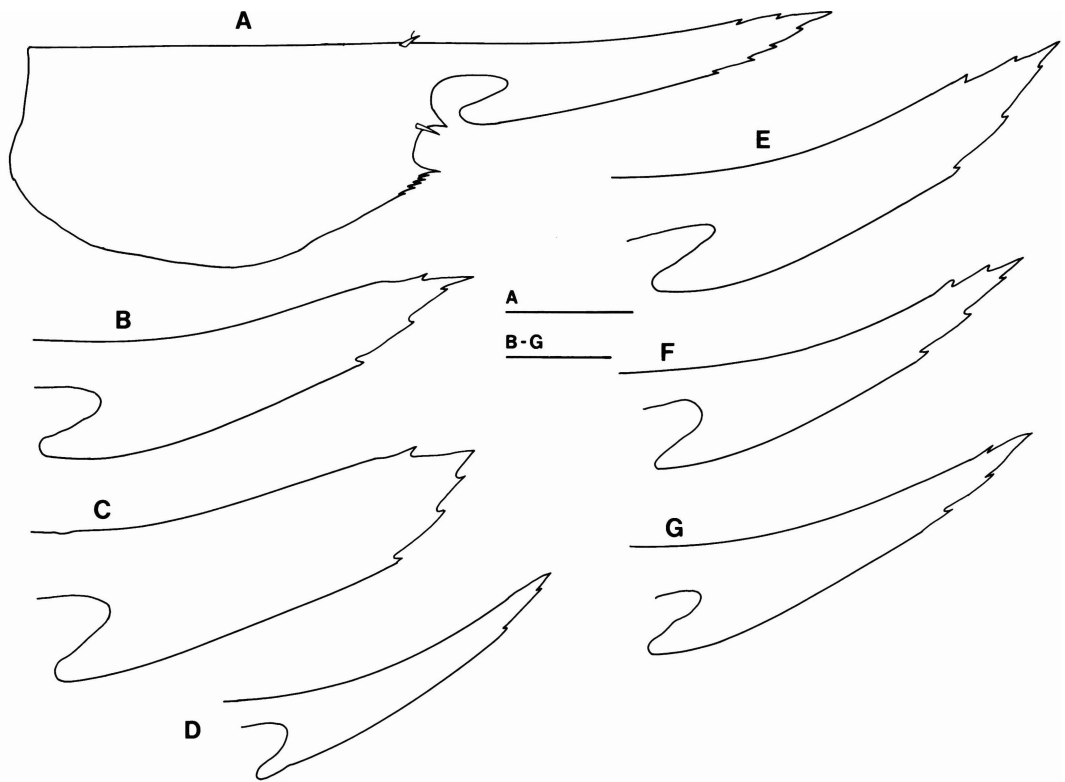


Fig. 3. *Latreutes pygmaeus* Nobili, Hansa Bay, Papua New Guinea: carapace of ov. female, cl. 3.84 mm (a), rostrum (b: ov. female cl. 3.40 mm, c: ov. female cl. 3.72 mm, d: male cl. 2.16 mm, e: ov. female cl. 3.40 mm, f: ov. female cl. 2.64 mm, g: male cl. 2.84 mm). Scale bars indicate 1 mm.

mately 0.88 of exopod length, with appendices at 0.32 along medial margin; appendix interna with few distal cincinnuli (Fig. 2h); appendix masculina with series of long, plumose setae; tip of appendix masculina with two long, sparsely plumose setae (Fig. 2h).

The present taxon has usually been recorded under the name *Latreutes pygmaeus*, however in the type description the name *Latreutes pymæus* is used (Nobili, 1904). Although this is more than likely a printing error, as Nobili himself in subsequent papers used the spelling *pygmaeus*, the original spelling should be used, as was already done by Chace (1997).

Distribution.- Ranges from the Red Sea and East Africa to Australia and Japan (Holthuis, 1978), extending into the Central Pacific (Hayashi, 1986). Usually associated with seagrasses and/or seaweeds (Johnson, 1961; Ledoyer, 1969, 1984):

***Latreutes porcinius* Kemp, 1916** (Fig. 4)

Restricted synonymy

Latreutes porcinius Kemp, 1916: 397-398, Fig. 3, Plate 36, fig. 3.

Latreutes porcinius; Hayashi, 1994: 96-97, Fig. 253.

L.[atreutes] nr porcinius; Wadley, 1978: 17, Fig. 8h.

Material examined.- Papua New Guinea, Hansa Bay, in front of Sisimangum village, 19.X. 1993, shrimp-dredge sample in *Syringodium isoetifolium* (Ascherson) Dandy bed, 5-6 m depth, leg. S. De Grave, 1 ovigerous female (cl. 3.52), KBIN I.G. 28056/NAT11.

Remarks.- The single specimen agrees in most details with the descriptions by Kemp (1916) and Hayashi (1994). The dorsal carina on the carapace bears 13 procurved teeth, which are separated into two groups; separated from rostral teeth by relatively narrow gap; rostral series con-

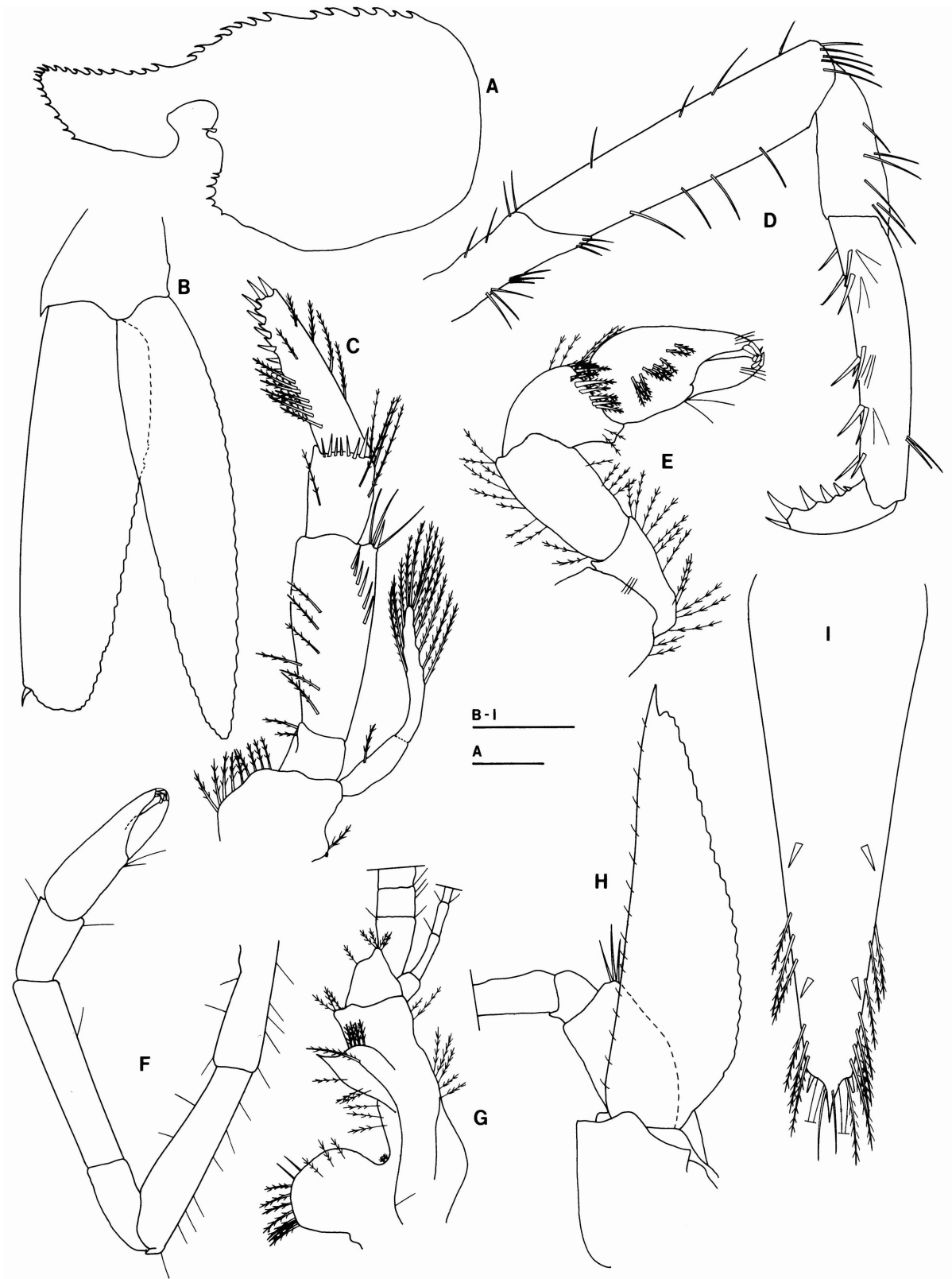


Fig. 4. *Latreutes porcinus* Kemp, Hansa Bay, Papua New Guinea: carapace (a), uropod (b), right third maxilliped (c), right third pereopod (d), right first pereopod (e), left second pereopod (f), peduncle of right antennula (g), antennal scale and peduncle of right antenna (h), telson (i). Scale bars indicate 0.5 mm (b-i) or 1 mm (a).

sisting of 21 teeth; antero-lateral margin of carapace with 6 teeth (Fig. 3a); hepatic spine mobile (Fig. 3a). Dactylus of third pereopod furnished with six stout spines, terminal spine more slender and shorter than sub-terminal one (Fig. 3d). Kemp (1916) illustrates three pairs of terminal telson spines, with the outer pair being smallest and the intermediate pair stouter and longer. In the present specimen, only two pairs of terminal telson spines are present, the inner ones being stouter and longer than the outer pair (Fig. 3i).

Distribution.- Previously known from Port Blair, Andaman Islands (Kemp, 1916); Singapore (Johnson, 1961); Phuket, Thailand (Komai, pers. comm.); Moreton Bay, Australia (Wadley, 1978); Okinawa Islands (Kamezaki et al., 1988) and Iriomote-jima Island, Yaeyama Islands, southern Ryukyus, Japan (Hayashi, 1994), always associated with seaweed or seagrass beds and/or pools in the intertidal or shallow subtidal regions.

Family Palaemonidae

Leander tenuicornis (Say, 1818)

Restricted synonymy

P[alaemon] tenuicornis Say, 1818: 249-250.

Leander tenuicornis; Holthuis, 1950: 26, Figs. 1-2; Ledoyer, 1969: 68; Plate 2 figs. 1A-6A, Plate 3 figs. 1-4, Plate 15A; Ledoyer, 1984: 25, Fig. 9; Chace & Bruce, 1993: 6-7.

Material examined.- Papua New Guinea, Hansa Bay, in front of Sisimangum village, 19.X. 1993, shrimp-dredge sample in *Syringodium isoetifolium* (Ascherson) Dandy bed, 5-6 m depth, leg. S. De Grave, 1 male (cl. 3.25), KBIN I.G. 28056/NAT11.

Remarks.- The single male specimen agrees with previous descriptions of the species (Holthuis, 1952; Manning, 1961). It harbours 11 dorsal rostral teeth, of which 2 are placed post-orbitally and 6 ventral teeth.

Distribution.- Widespread in the Indo-Pacific and Atlantic Oceans (Chace & Bruce, 1993). This species is nearly always associated with attached vegetation in shallow water, previously

found in association with seagrass beds (Ledoyer, 1969, 1984; Manning, 1961; Coen & Heck, 1984). Has been reported previously from Papua New Guinea (near Hood Point, Beagle Bay, Central Province) by Nobili (1899), as *Periclimenes parasiticus* and *Periclimenes tenuipes* (partim) (see Holthuis, 1952).

Periclimenes amymone De Man, 1902

Restricted synonymy

Periclimenes amymone De Man, 1902: 829, Plate 25 fig. 53.

Periclimenes (Harpilius) amymone; Holthuis, 1952: 82-83, Fig. 32; Johnson, 1961: 58.

Periclimenes amymone; Bruce, 1980:262-264, Fig. 1e-i; Chace & Bruce, 1993: 102-103.

Periclimenes (Harpilius) cf. amymone; Ledoyer, 1984: 28-29, Fig. 11.

Material examined.- Papua New Guinea, Hansa Bay, in front of Sisimangum village, 19.X. 1993, shrimp-dredge sample in *Syringodium isoetifolium* (Ascherson) Dandy bed, 5-6 m depth, leg. S. De Grave, 1 male (cl. 2.16) KBIN I.G. 28056/NAT11.

Remarks.- The single male specimen corresponds closely to previous descriptions. The rostrum is armed with 7 dorsal teeth, of which one is placed post-orbitally and 2 ventral teeth.

Distribution.- The species ranges from the Nicobar Islands to Samoa (Chace & Bruce, 1993) and is normally associated with a range of scleractinian coral genera (Bruce, 1977). It has been previously found in a seagrass habitat by Ledoyer (1984), who did not consider it a typical component of the seagrass community.

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