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**Deep-water Galatheidae (Crustacea: Decapoda: Anomura)
from southern and eastern Australia**

SHANE T. AHYONG & GARY C. B. POORE



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Abstract

Twenty-nine species in five genera of deep-water Galatheididae are reported from southern and eastern Australia increasing the known Australian galatheid fauna from 55 to 74. Species of *Paramunida* and *Agononida* are reported for the first time from southern Australia, with a new species of each described, *P. antipodes* and *A. procera*. Seven new species of *Munida* are described (*M. aequalis*, *M. asprosoma*, *M. chydaea*, *M. endeavourae*, *M. isos*, *M. kapala*, and *M. spinicruris*) increasing the number of known Australian species from 12 to 19. Four new species of *Munidopsis* are described (*Ms. kensleyi*, *Ms. proales*, *Ms. tasmaniae*, *Ms. treis*) and three species are newly recorded from Australia (*Ms. centrina*, *Ms. dasypus*, *Ms. subsquamosa*) increasing the known fauna from 11 to 18. Previous records of *Ms. dasypus* are based on *Ms. kensleyi*, but we include the first reliable record of *M. dasypus* from Australia. Previous records of *Munida japonica* from Australia are referable to *M. rogeri* Macpherson. Previous Australian records of *Munida microps* Alcock are referable to two new species, *M. endeavourae* and *M. isos*. Previous Australian records of *Ms. dasypus* are referable to *Ms. kensleyi*. *Raymunida formosanus* Lin, Chan & Chu is reported for the first time from Australia. Alcock's (1894) *Munida squamosa* var. *prolixa* is recognised as a distinct species of *Agononida*.

Key words: Crustacea, Decapoda, Anomura, Galatheididae, *Agononida*, *Munida*, *Munidopsis*, *Paramunida*, *Raymunida*, new species, taxonomy

Introduction

Australian deep-water squat lobsters of the family Galatheididae are known from several studies (Henderson 1885, 1888, Haig 1973, Baba 1986, 1994, Baba & Poore 2002). The present study reports on the southern and eastern Australian deep-water Galatheididae of the

genera *Munidopsis* Whiteaves, 1874, *Munida* Leach, 1820, *Paramunida* Baba, 1988, *Raymunida* Macpherson & Machordom, 2000 and *Agononida* Baba & de Saint Laurent, 1996 collected primarily between southern Queensland and southern Western Australia. Ken Graham aboard the FRV *Kapala* (formerly New South Wales Fisheries) collected most specimens between 1975 and 1997. Other specimens came from various sources, the most important of which are the 1911–1914 *Endeavour* Expedition and various cruises of CSIRO and SARDI research vessels conducted over the past decade. Prior to this report, four species of *Munida*, one species of *Raymunida* and eight species of *Munidopsis* were known from the study area (Davie 2002, Baba & Poore 2002). The present study complements a similar recent study of the southern Australian Chirostylidae (Ahyong & Poore 2004) that reported a fourfold increase in the known fauna. Here, we also report a significant increase in the known deep-water galatheid fauna. Twenty-nine species in five genera are reported below, of which 13 are described as new.

Materials and methods

Measurements of specimens, given in millimetres (mm), indicate the carapace length (cl.) including the rostrum unless otherwise indicated. In some cases, orbital carapace length (ocl.) is indicated, and is measured from the posterior margin of the orbit to the posterior margin of the carapace. Specimens listed under material examined collected at a station prefixed by “K”, such as “K88-22-04”, “K80-07-11”, “K80-12-01”, etc were collected by Ken Graham (New South Wales Fisheries) aboard the FRV *Kapala*. Similarly, specimens from stations prefixed “SS”, “SO” and “FR” were taken by the RV *Southern Surveyor*, RV *Soela* and RV *Franklin* respectively. Specimens examined are deposited in the collections of the Australian Museum, Sydney (AM), Muséum national d’Histoire naturelle, Paris (MNHN), Museum Victoria, Melbourne (NMV), the South Australian Museum, Sydney (SAM), and National Museum of Natural History, Smithsonian Institution, Washington D.C. (USNM). Other abbreviations: CSIRO (Commonwealth Scientific and Industrial Research Organisation), FRV (Fisheries Investigation Ship), RV (Research Vessel), SARDI (South Australian Research and Development Institute). In all keys, taxa treated herein are marked in bold.

Systematic account

Galatheidae Samouelle, 1819

Remarks. Representatives of ten galatheid genera are known from Australian waters. The genera are distinguished in the key below.

Key to genera of Galatheidae known from Australia

- 1 Eyes poorly developed, reduced. Exopod of first maxilliped without flagellum.....
..... **Munidopsis Whiteaves, 1874**
- Eyes well developed. Exopod of first maxilliped with flagellum 2
- 2 Rostrum triangular, flattened dorsally 3
- Rostrum with spiniform median spine flanked either side by supraocular spine..... 6
- 3 Endopod of uropod markedly broader than long. Carapace without transverse ridges ..
..... **Lauriea Baba, 1971**
- Endopod of uropod about as broad as long. Carapace with transverse ridges 4
- 4 Rostrum with minute subterminal and distinct basal spine on each side
..... **Phylladorhynchus Baba, 1969**
- Rostrum with spines or spinules distributed along margins 5
- 5 Rostrum strongly elongate, ventrally carinate, with 5–9 small lateral spines
..... **Allogalthea Baba, 1969**
- Rostrum of moderate length, flat, with 2–5 distinct lateral spines
..... **Galathea Fabricius, 1793**
- 6 Epipods present on first to third pereopods.....
..... **Raymunida Macpherson & Machordom, 2000**
- Epipods absent from all pereopods 7
- 7 Carapace without dorsal spines **Anoplonida Baba & de Saint Laurent, 1996**
- Carapace with dorsal spines 8
- 8 Carapace without transverse ridges, covered with small tubercles, small spines, or very
short ridges **Paramunida Baba, 1988**
- 9 Carapace with long, distinct transverse ridges. Dorsal spines not evenly covering
entire surface 10
- 10 Male gonopods on second abdominal somite only
..... **Agononida Baba & de Saint Laurent, 1996**
- Male gonopods on first and second abdominal somites **Munida Leach, 1820**

Agononida Baba & de Saint Laurent, 1996

Agononida Baba & de Saint Laurent, 1996: 441.

Remarks. The species of *Agononida* reported below represent the first records of the genus from New South Wales. One species, *A. procera*, is described as new. *Agononida incerta*, *A. eminens* and *A. squamosa* are already known from northern Australia (Baba 1994, Davie 2002), but *A. marini* is a new record for Australian waters. Two additional species of *Agononida* were reported from tropical Australia by Baba (1986, 1994) (*A. pilosimanus* Baba, 1969, *A. soelae* Baba, 1986). Under the account of *A. squamosa*, we recog-

nise Alcock's (1894) *Munida squamosa* var. *prolixa* as a distinct species of *Agononida*. The seven species of *Agononida* currently known from Australia are distinguished in the key below.

Key to species of *Agononida* known from Australia

- 1 Basal antennal segment produced to long slender spine, extending anteriorly beyond eyes 2
 - Basal antennal segment produced to short triangular spine, not extending beyond eyes 4
- 2 Carapace without cardiac spines *A. incerta* (Henderson, 1888)
 - Carapace with cardiac spines 3
- 3 Carapace with median mesogastric spines *A. eminens* (Baba, 1988)
 - Carapace without median mesogastric spines *A. marini* Macpherson, 1994
- 4 Carapace with pair of protogastric spines behind pair of epigastric spines; with 2 or more cardiac spines 5
 - Carapace without protogastric spines; with at most single median cardiac spine 6
- 5 Propodus of cheliped with palm 17–18 times as long as high and about twice as long as dactylus *A. procera* n. sp.
 - Propodus of cheliped with palm about 9 times as long as high and about 1.6 times as long as dactylus *A. soelae* (Baba, 1986)
- 6 Carapace without cardiac spines *A. pilosimanus* (Baba, 1969)
 - Carapace with single median cardiac spine *A. squamosa* (Henderson, 1885)

Agononida eminens (Baba, 1988)

Munida eminens Baba, 1988: 95–98, fig. 35 [type locality: off southeastern Luzon, Philippines]; 1994: 11. — Macpherson, 1994: 466, fig. 72; 1995: 392.

Agononida eminens. — Macpherson, 1997: 600; 1999: 412–413. — Davie, 2002: 59.

Material examined. QUEENSLAND: AM P66655, 1 male (22.2 mm), 3 females (14.9–19.0 mm), Lord Howe Rise, Tasman Sea, 28°05.76'S, 163°06.04'E, 1051 m, coarse ooze with pumice, beam trawl, FR0589-25, 5 May 1989. NEW SOUTH WALES: AM P19381, 1 female (26.7 mm), off Botany Bay, 34°00'S, 151°43'E, 720 m, K72-07-01, 6 Nov 1972; AM P26773, 1 female (21.5 mm), SE of Broken Bay, 33°40'S, 151°56'E, 714–732 m, trawl, K77-23-06, 6 Dec 1977.

Remarks. As reported for the paratype (Baba 1988) for material from north Queensland (Baba 1994), New Caledonia (Macpherson 1994), Wallis and Futuna Islands (Macpherson 1996), the present specimens differ from the account of the holotype (Baba

1988) in lacking the posterior cardiac spine. As also reported for north Queensland and New Caledonian material, the female specimens of the present series bear two instead of three branchiocardiac spines. The male bears two branchiocardiac spines on one side and three on the other, and four instead of two spines on the posteromedian margin of the carapace.

Distribution. The Philippines, Indonesia, Queensland, and New Caledonia, Lifou, Wallis and Futuna Islands at 564–1000 m (Macpherson 1999). The present records extend the geographic and bathymetric ranges to New South Wales and 1051 m respectively.

***Agononida incerta* (Henderson, 1888)**

Munida incerta Henderson, 1888: 130, pl. 13, fig. 4a [type locality: off Sibago Island, Philippines].

— Baba *et al.*, 1986: 171, 290, fig 121; 1988: 106; 1994: 12. — Macpherson, 1994: 478, fig. 74; 1996: 394.

?*Munida incerta*. — Baba, 1994: 12.

Munida sp. cf. *squamosa*. — Jones & Morgan, 2002: 135 [colour plate].

Agononida incerta. — Baba & de Saint Laurent, 1996: 442. — Macpherson, 1997: 600, 602; 1999: 413. — Davie, 2002: 59.

Material examined. Form-a. NEW SOUTH WALES: AM P49277, 1 male (29.5 mm), 65 km E of Sydney, 457 m, S. Leonard, 17 Feb 1997; AM P42274, 1 female (22.0 mm), NE of Sugarloaf Point, 32°15'S, 153°02'E, 427 m, K78-03-04, 5 Apr 1978; AM P31486, 1 male (30.0 mm), E of Batemans Bay, 33°45'S, 150°36'E, 270 m, K77-03-04, Apr 1977; AM P21761, 1 female (37.8 mm), SE of Clarence River, 29°41–32'S, 153°45–47'E, 414 m, K75-09-04, 10 Oct 1975; AM P21690, 2 males (33.0–34.8 mm), SE of Clarence River, 29°41–32'S, 153°45–47'E, 414 m, K75-09-04, 10 Oct 1975; AM P21012, 1 female (24.1 mm), E of Broken Bay, 33°25–30'S, 152°03–07'E, 641 m, K75-05-04, 19 Aug 1975; AM P46658, 1 female (29.4 mm), off Tweed Heads, 28°10'S, 153°33'E, 600 m, N. Coleman, Jun 1978; AM P42282, 1 ovigerous female (22.5mm), NE of North Solitary Island, 29°48'S, 153°43'E, 430 m, K78-16-07, 2 Aug 1978; AM P31495, 2 males (28.0–36.7 mm), 3 females (20.9–31.8 mm), NE of North Solitary Island, 29°38'S, 153°47'E, 470 m, K78-23-15, 7 Nov 1978; AM P31496, 1 ovigerous female (33.0 mm), NE of North Solitary Island, 29°32'S, 153°48'E, 412 m, K78-16-03, 2 Aug 1978; AM P31427, 1 ovigerous female (36.2 mm), NE of Woolli, 29°47–49'S, 153°44–43'E, 437 m, K78-16-07, 2 Aug 1977; AM P67306, 1 male (32.2 mm), E of Woolli, 29°52'S, 153°43'E, 495 m, K77-13-10, 23 Aug 1977.

Form-b: QUEENSLAND: AM P42262, 8 males (14.4–35.1 mm), 8 females (22.5–36.6 mm), NE of Tweed Heads, 27°57'S, 154°03'E, 548 m, beam trawl, K78-23-09, 6 Nov 1978.

NEW SOUTH WALES: AM P31429, 2 males (33.0–35.0 mm), 2 females (25.4–34.0 mm), SE of Cape Byron, 28°42'S, 153°51'E, 150 m, K78-17-21, 18 Aug 1978.

Remarks. The present series includes two forms, both identifiable with *A. incerta*. Form-a corresponds to those reported by Baba (1994) from north Queensland by having the “pronounced outward process on the anterior lateral expansion of the telson” in males, and relatively slender, subcylindrical chelae in which the merus lacks a ventral row of spines. Sexual dimorphism of the chelae in form-a is slight and no gape is present between the dactylus and pollex. Form-b lacks the lateral process on the telson margins in males, and the chelae are more robust, prismatic in cross-section with more strongly rugose surfaces, and a row of 2–4 small spines on the lower margin of the merus. Sexual dimorphism of the chelae in adult males of form-b is pronounced such that a distinct gape is present between the dactylus and pollex. In addition, the chelae are more robust in form-b such that the palm is markedly more inflated in form-b females than in either sex of form-a. Similar morphological variation was observed by Macpherson (1994) between specimens from various Indo-West Pacific localities. Colour patterns of the two forms are also probably different. Live specimens of form-a are a pale-cream colour with a red band across the distal portion of the dactylus, propodus and merus of the walking legs, and a red band across the articulations of the chelipeds. A specimen of form-a from northwestern Australia is figured in colour by Jones & Morgan (2002: 135) as *Agononida* sp. cf. *squamosa*. Conversely, a specimen of *A. incerta* that appears to correspond to form-b, figured in colour by Baba *et al.* (1986: 170), has a reddish overall colouration without banding across the pereopods. Unfortunately, the holotype of *A. incerta* is a female and lacks chelae (Henderson 1888). Other Philippine specimens, however, are reported to have subcylindrical chelae (Macpherson 1994) suggesting that form-b might be referable to *A. incerta* sensu stricto. The two forms almost certainly represent distinct species but are not further treated here owing to ongoing study of the species by Keiji Baba (Kumamoto University, Japan).

Distribution. Western Indian Ocean to Indonesia, the Philippines, Japan, the central Pacific, and eastern Australia; 17–720 m (summarised by Macpherson 1994).

Agononida marini (Macpherson, 1994)

Munida marini Macpherson, 1994: 492, 495, figs. 30, 77 [type locality: New Caledonia].

Agononida marini. — Baba & de Saint Laurent, 1996: 442.

Material examined. QUEENSLAND: AM P42265, 10 males (27.8–37.7 mm), 10 females (30.3–34.6 mm), NE of Tweed Heads, 27°57'S, 154°03'E, 548 m, K78-23-09, 6 Nov 1978; AM P31424, 1 female (28.9 mm), NE of Tweed Heads, 27°57'S, 154°03'E, 548 m, K78-23-09, 6 Nov 1978. NEW SOUTH WALES: AM P53252, 1 male (31.4 mm), 64–80 km E of Sydney, 476 m, trawl, S. Leonard & S. Ahyong, 18–19 Feb 1997; AM P31510, 1 male (21.9 mm), NE of Long Reef, 33°41'–39'S, 151°53'–56'E, 485 m, K80-21-05, 16 Dec 1980; AM P42275, 1 male (16.7 mm), 1 female (21.2 mm), E of Long Reef, 33°40'S,

151°54'E, 485 m, K80-21-05, 16 Dec 1980; AM P66657, 1 male (27.6 mm), 65 km E of Sydney, 457 m, S. Leonard, 16–17 Feb 1997.

Remarks. The present series is morphologically uniform in most features, but spination of the anterior margin of the fourth abdominal tergite is variable. Forty-four percent of specimens bear four spines on the anterior margin of the fourth tergite, 36% bear only two submedian spines, and 20% bear three spines (two submedian and one lateral). The relative length of the dactyli of pereopods 2–4 varies allometrically ranging from slightly less than half the propodal length to slightly more than half the propodal length (pereopods 2–3) or equal to half the propodal length (pereopod 4). The lateral spination of the fourth abdominal tergite is not presently used as a diagnostic character. The relative length of the dactyli of pereopods 2–4, however, are often treated as diagnostic, and present results indicate that it should be used with caution in distinguishing species.

Macpherson (1994: fig. 30C) incorrectly shows a spine on the outer instead of inner distal margin of the third segment of the antennal peduncle. The Australian specimens and holotype (reexamined at the MNHN) bear a spine on the inner distal margin of the third antennal peduncle segment.

Distribution. New Caledonia and now from eastern Australia between Sydney, New South Wales, and northeast of Tweed Heads, southern Queensland; 457–548 m.

Agononida procera n. sp. (Fig. 1)

Type material. HOLOTYPE: AM P25095, female (22.8 mm), E of Broken Bay, New South Wales, 33°32'S, 152°03'E, 823 m, K76-24-03, 20 Dec 1976. PARATYPES: AM P42260, 1 male (22.1 mm), NE of Tweed Heads, Queensland, 28°03'S, 154°04'E, 731 m, K78-23-08, 6 Nov 1978; AM P42263, 1 female (27.3 mm), NE of Tweed Heads, Queensland, 28°03'S, 154°04'E, 731 m, K78-23-08, 6 Nov 1978; AM P20993, 1 female (20.3 mm), E of Broken Bay, New South Wales, 33°32–38'S, 152°00–04'E, 824 m, K75-05-05, 19 Aug 1975; AM P19382, 1 female (22.3 mm), E of Long Reef, New South Wales, 33°43'S, 151°55'E, 675 m, K72-06-04, 19 Oct 1972; AM P19383, 1 female (16.8 mm), E of Sydney, New South Wales, 33°51'S, 151°51'E, 675 m, K72-06-03, 19 Oct 1972.

Diagnosis. Carapace transverse ridges mostly uninterrupted; cervical groove shallow; with pair of epigastric spines followed by pair of protogastric spines; with small hepatic spine lateral to epigastric and protogastric spines; with transverse row of 2–4 cardiac spines; with line of 2–4 branchiocardiac spines either side of cardiac spines; posterior margin with 4–13 antrorse spines; lateral margin of carapace anterior to cervical groove with 2 spines (including anterolateral) and 4 spines posterior to cervical groove. Fourth sternite with several short striae at most; remaining sternites smooth. Second and third abdominal tergites with row of 4 spines on anterior border; fourth tergite with row of 4 spines on anterior border and single spine on posterior border. Terminal spines of basal antennular segment subequal. Inner margin of basal antennal segment with stout triangular tooth, not

exceeding second segment. Second segment with inner and outer distal spine, neither overreaching third segment. Cheliped slender, subcylindrical; propodus with palm 17–18 times as long as high, about twice as long as pollex. Walking legs with propodus 18–22 times as long as high; dactylus slightly exceeding one-third propodus length; extensor margin crenulate; flexor margin denticulate along distal three-quarters.

Description. *Carapace*: Transverse ridges mostly uninterrupted; cervical groove shallow; with pair of epigastric spines followed by pair of protogastric spines; with small hepatic spine lateral to epigastric and protogastric spines; with transverse row of 2–4 (usually 2) cardiac spines; with line of 2–4 (usually 4) branchiocardiac spines either side of cardiac spines. Posterior margin with 4–13 antrorse spines. Frontal margins transverse; rostrum slender, spiniform, about twice as long as supraocular spines. Supraocular spines subparallel. Anterolateral spine well developed, situated at anterolateral angle, extending to or slightly beyond sinus between rostrum and supraocular spine. Lateral margin of carapace anterior to cervical groove with 2 spines (including anterolateral) and 4 spines posterior to cervical groove.

Sternum: Fourth sternite with several short striae at most; remaining sternites smooth; ridges demarcating fourth to seventh sternites feebly granular.

Abdomen: Second and third tergites with row of 4 spines on anterior border. Fourth tergite with row of 4 spines on anterior border and single spine on posterior border.

Eye: Large, with maximum corneal diameter about one-third basal distance between anterolateral spines; with short distal setae on peduncle ('eyelashes').

Antennule: Basal segment slightly overreaching cornea; with 2 subequal terminal spines; outer margin strongly convex, with two lateral spines, proximal spine minute.

Antenna: Inner margin of basal segment with stout triangular tooth, not exceeding second segment. Second segment with inner and outer distal spine, neither overreaching third segment. Third and fourth segments unarmed.

Maxilliped 3: Ischium with strong distal flexor spine. Midflexor margin of merus with spine; extensor margin unarmed.

Pereopod 1 (cheliped): Slender, subcylindrical, about 3.0–3.5 times carapace length; sparsely squamous and setose. Dactylus unarmed dorsally; occlusal margin denticulate. Propodus upper and outer margin spinose; palm about 17–18 times as long as high, about twice as long as pollex; pollex with 2 terminal spines, ventrally unarmed, occlusal margin denticulate. Carpus and merus with irregularly distributed spines on lateral, dorsal and mesial surfaces; spines strongest distally.

Pereopod 2: Merus extensor margin with 10–12 spines; flexor margin with 6–8 spines. Carpus with 2 or 3 extensor and 1 distal flexor spine. Propodus flexor margin with 6 or 7 minute movable spines; 18–19 times as long as high. Dactylus slightly exceeding one-third propodus length; extensor margin crenulate; flexor margin denticulate along distal three-quarters.

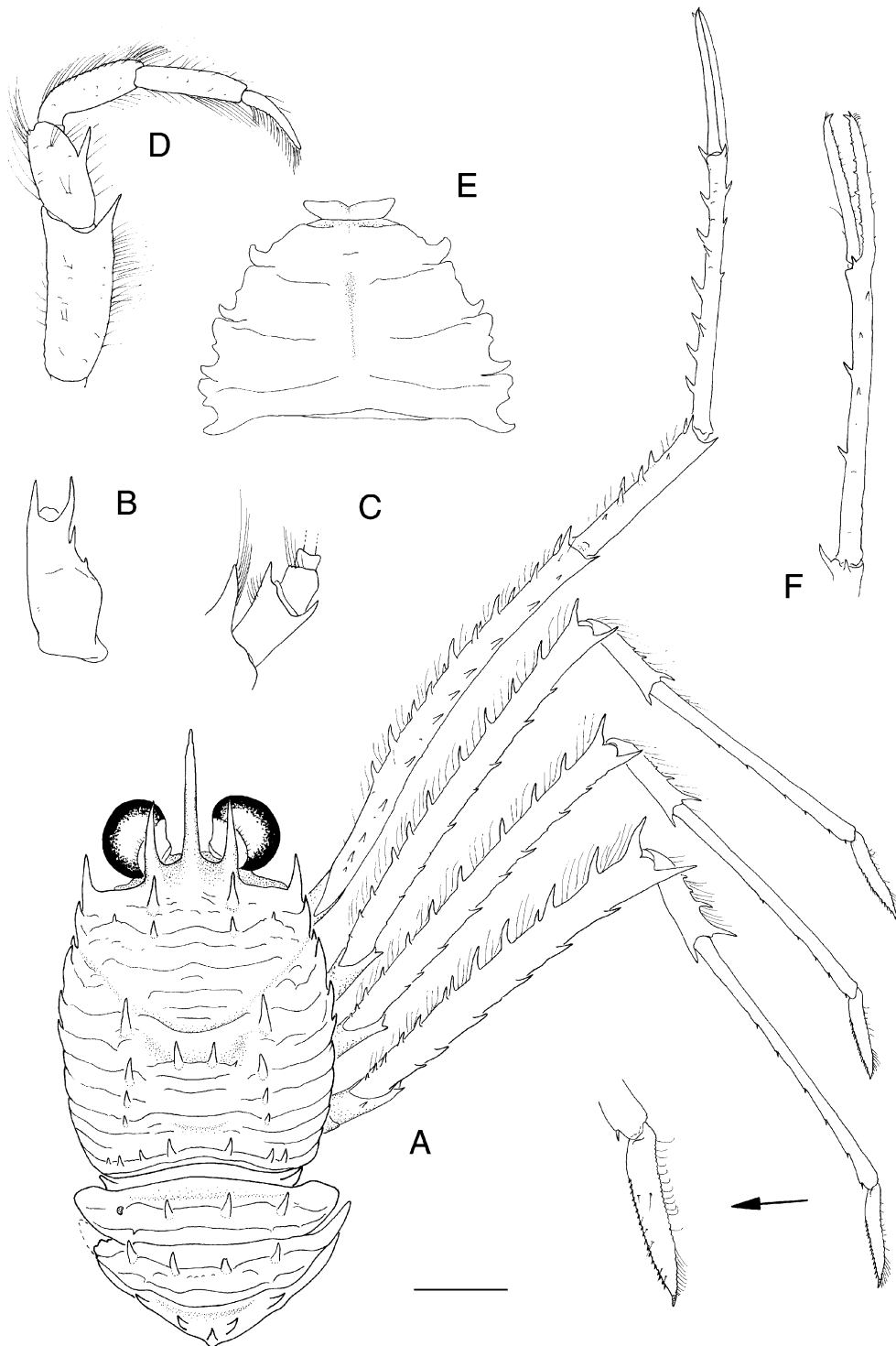


FIGURE 1. *Agononida procera* n. sp., holotype female (22.8 mm), AM P25095. A, dorsum. B, left basal antennular segment, ventral. C, left antennal peduncle, ventral. D, right third maxilliped, lateral. E, sternum. F, right chela, lateral. Scale: A, F = 5 mm, B–D = 2.5 mm, E = 3.5 mm.

Pereopod 3: Merus extensor margin with 11–14 spines; flexor margin with 7–9 spines. Carpus with 2 extensor and 1 distal flexor spine. Propodus flexor margin with 5 or 6 minute movable spines; 18–20 times as long as high. Dactylus slightly exceeding one-third propodus length; extensor margin crenulate; flexor margin denticulate along distal three-quarters.

Pereopod 4: Merus extensor margin with 10–14 spines; flexor margin with 6–9 spines. Carpus with 2–4 extensor and 1 distal flexor spine. Propodus with 5 or 6 minute movable flexor spines; 18–22 times as long as high. Dactylus slightly exceeding one-third propodus length; extensor margin crenulate; flexor margin denticulate along distal three-quarters.

Etymology. From the Latin *procerus*, slender, alluding to the very slender chelipeds that distinguish the species from *A. soelae*.

Remarks. It is with some hesitation that we assign the present specimens to a new species in view of their strong similarity to *A. soelae* Baba, 1986. *Agononida soelae* was described from the Northwest Shelf but is also reported from Japan, Taiwan, New Caledonia, Indonesia and the Austral Islands, French Polynesia (Baba *et al.* 1986, Wu *et al.* 1998, Macpherson 1994, 1997, and Poupin 1996, respectively). The characters by which the present specimens (of both sexes) differ from *A. soelae* are consistent, however, justifying recognition of the new species. *Agononida procera* n. sp. closely resembles *A. soelae* but differs in the relative slenderness of the cheliped, and in the relative length and ornamentation of the pereopodal dactyli. The palm of the cheliped in *A. procera* differs from that of *A. soelae* in measuring at least double instead of 1.6 times the length of the dactylus and pollex. The dactyli of pereopods 2–4 in *A. procera* differ from those of *A. soelae* in being less slender and minutely spinose on the flexor margin for the distal three-quarters instead of the median third.

The figures given by Baba *et al.* (1986) and Wu *et al.* (1998) for a specimen from Japan and Taiwan, respectively, agree well with *A. soelae* sensu stricto. Records of *A. soelae*, however, from New Caledonia, Indonesia and the Austral Islands require verification. Unfortunately, Macpherson (1994, 1997) did not remark on the chelipeds of his New Caledonian and Indonesian specimens referred to *A. soelae*. The specimen from the Austral Islands, French Polynesia, figured by Poupin (1996) (and more fully at his website <http://decapoda.ecole-navale.fr>) differs in coloration from that figured by Wu *et al.* (1997) and appears not to be referable to *A. soelae*. Poupin's specimen requires restudy; it might be referable to *A. procera* or an undescribed species.

Distribution. Known only from eastern Australia between southern Queensland and Broken Bay, New South Wales; 675–824 m depth.

Agononida squamosa (Henderson, 1885)

Munida squamosa Henderson, 1885: 409; 1888 [type locality: N of Admiralty Islands]; 131–133, pl. 13: fig. 1. — Baba, 1994: 16. — Macpherson, 1993a: 425, fig. 1h–i; 1994: 537, fig. 96;

1996: 406, 408.

Agononida squamosa. — Baba & de Saint Laurent, 1996: 442. — Macpherson, 1997: 603; 1999: 414–415, figs. 3b–c. — Davie, 2002: 59.

Material examined. NEW SOUTH WALES: AM P66652, 1 ovigerous female (17.3 mm), SE of Cape Byron, 28°41'S, 153°51'E, 156 m, K78-17-21, 18 Aug 1978; AM P21763, 1 male (22.8 mm), SE of Clarence River, 29°41'S, 153°47'E, 406–414 m, K75-09-04, 10 Oct 1975; AM P21765, 4 males (16.7–24.4 mm), 7 ovigerous females (15.3–20.4 mm), SE of Clarence River, 29°41'S, 153°47'E, 406–414 m, K75-09-04, 10 Oct 1975; AM P31491, 1 male (22.6 mm), NE of Solitary Island, 29°52'S, 153°42'E, 480 m, K78-06-07, 26 April 1978; AM P42259, 4 males (21.0–22.5 mm), 4 females (19.3–24.0 mm), NE of Sugarloaf Point, 32°15'S, 153°02'E, 457 m, trawl, K78-03-04, 5 Apr 1978; AM P42270, 1 female (22.5 mm), NE of Sugarloaf Point, 32°15'S, 153°02'E, 457 m, trawl, K78-03-04, 5 Apr 1978; AM P42272, 1 male (16.8+ mm), E of Long Reef, 33°40'S, 151°54'E, 468 m, K80-21-05, 16 Dec 1980; AM P66651, 1 male (19.0 mm), 1 female (12.0 mm), NE of Long Reef, 33°42'S, 151°54'E, 439–466 m, K85-21-06, 19 Dec 1985; AM P31513, 1 female (17.3 mm), E of Long Reef, 33°46'S, 151°49'E, 439 m, K80-21-04, 16 Dec 1980; NMV J21036, 1 female (21.8 mm), E of Long Reef, 33°46'S, 151°49'E, 421–503 m, K81-17-03, 9 Sep 1981; AM P31505, 1 female (21.6 mm), E of Port Jackson, 450 m, 5 May 1978; AM P21053, 1 ovigerous female (23.0 mm), NE of Wollongong, 34°14'S, 151°28'E, 403 m, K75-05-02, 8 Aug 1975; AM P21039, 1 ovigerous female (22.6 mm), NE of Wollongong, 34°16–22'S, 151°26–23'E, 366 m, K75-05-01, 8 Aug 1975; AM P21103, 1 male (20.3 mm), 2 ovigerous females (19.1–22.9 mm), NE of Wollongong, 34°16–22'S, 151°26–23'E, 366 m, K75-05-01, 8 Aug 1975.

Comparative material of *Munida squamosa* var. *prolixa* Alcock, 1894. AM P2650 (ex IM 773/10), 1 male (26.9 mm), Arabian Sea, 1232 m, *Investigator* stn 204.

Remarks. *Agononida squamosa* was reported from Queensland by Baba (1994). The present specimens agree well with the type description (Henderson 1885) and the most recent accounts and figures (Macpherson 1993a: fig. 96, 1993a: fig. 1h–i, 1994) of the species. All specimens bear a strong mesial terminal spine on the second antennal segment and six lateral carapace spines (1 anterolateral, 1 hepatic and 4 branchial). In his type account of *Agononida analoga* (as *Munida analoga*) Macpherson (1993a) reported on two *Investigator* specimens of *A. squamosa* var. *prolixa* Alcock, 1894 (as *Munida*) and suggested that Alcock's subspecies might be distinct from *A. squamosa* with which it was regarded as a synonym by Baba (1988). Macpherson (1993a) noted that the two specimens of *A. squamosa* var. *prolixa* differed from *A. squamosa* sensu stricto in having a blunt mesial terminal spine on the second antennal segment and three instead of four branchial spines on the carapace. Characters of another *Investigator* specimen of Alcock's var. *prolixa* (AM P2650) fully corroborate Macpherson's (1993a) observations. The differences between Alcock's subspecies and *A. squamosa* sensu stricto, although subtle, are consistent and warrant recognition of Alcock's subspecies as a distinct species. *Agononida pro-*

lixa (Alcock, 1894) n. comb. is presently known only from the eastern Indian Ocean (Andaman and Arabian Seas) and *A. squamosa* is presently known only from the western Oceania. The ranges of *A. prolixa* and *A. squamosa* do not overlap, but a very similar species, *A. analoga* Macpherson, exhibits an intermediate distribution in the South China Sea (Macpherson 1993a).

A 22.8 mm male specimen (AM P21763) of *A. squamosa* has a bopyrid isopod infection (AM P21764) under the right posterior portion of the carapace.

Distribution. Admiralty Islands, New Caledonia, Lifou, Vanuatu, Wallis Islands, and eastern Australia at depths between 156 and 752 m (Macpherson 1999). Reported for the first time from New South Wales.

***Munida* Leach, 1820**

Munida Leach, 1820: 52.

Remarks. Davie (2002) reported 12 species of *Munida* from Australia. Twelve species of *Munida* are reported below. Seven are described as new, and three are new records for the study area. Haig's (1973) record of *M. japonica* Stimpson, 1858, from Western Australia is based on *M. rogeri* Macpherson, 1994, and her records of *M. microps* Alcock, 1894 from New South Wales are referable to *M. endeavourae* n. sp. and *M. isos* n. sp., both described below. Baba's (1994) record of *M. microps* from Queensland appears to be based on a different species (see discussion under account of *M. asprosoma* n. sp.). Therefore, *M. microps* is excluded from the key below. Part of Haig's (1973) material identified as *M. haswelli* Henderson, 1885 is referable to *M. chydrea* n. sp. The 19 species of *Munida* now known from Australia are distinguished in the key below.

Key species of *Munida* known from Australia

- | | | |
|---|---|---|
| 1 | Lateral margin of carapace with 1, 3 or 4 spines behind cervical groove | 2 |
| – | Lateral margin of carapace with 5 spines behind cervical groove | 4 |
| 2 | Lateral margin of carapace with 1 spine behind cervical groove | |
| | <i>Munida leviantennata</i> Baba, 1988 | |
| – | Lateral margin of carapace with 3 or 4 spines behind cervical groove | 3 |
| 3 | Lateral margin of carapace with 3 spines behind cervical groove | |
| | <i>Munida kapala</i> n. sp. | |
| – | Lateral margin of carapace with 4 spines behind cervical groove | |
| | <i>Munida rogeri</i> Macpherson, 1994 | |
| 4 | Third abdominal somite with spines on anterior margin..... | 5 |
| – | Third abdominal somite without spines on anterior margin..... | 8 |

- 5 Fourth abdominal somite with pair of spines on anterior margin *Munida gregaria* (Fabricius, 1793)
- Fourth abdominal somite without pair of spines on anterior margin 6
- 6 Terminal spines of basal antennular segment unequal 7
- Terminal spines of basal antennular segment equal or subequal..... *Munida spinulifera* Miers, 1884
- 7 Basal antennular segment with inner distal spine longer than outer..... *Munida chydaea* n. sp.
- Basal antennular segment with inner distal spine shorter than outer *Munida asprosoma* n. sp.
- 8 Terminal spines of basal antennular segment equal or subequal..... 9
- Terminal spines of basal antennular segment unequal 14
- 9 Second abdominal somite without spines on anterior margin..... *Munida alia* Baba, 1994
- Second abdominal somite with spines on anterior margin, either along entire margin or laterally 10
- 10 Supraocular spines, short, less than one-quarter length of rostral spine. Lateral portion of seventh sternite with patch of granules..... *M. heteracantha* Ortmann, 1892
- Supraocular spines extending almost to midlength of rostral spine. Lateral portion of seventh sternite without patch of granules 11
- 11 Rostrum spiniform..... 12
- Rostrum laterally compressed *Munida rubridigitalis* Baba, 1994
- 12 Proximoventral margin of pollex of chela with 1 or more spines. Mesial spine of basal antennal segment reaching almost to base of third peduncle segment..... 13
- Proximoventral margin of pollex of chela without spines. Mesial spine of basal antennal segment reaching not nearly reaching base of third peduncle segment *M. curvirostris* Henderson, 1885
- 13 Second abdominal somite with more than 5 transverse striae. Cheliped 2.5–3 times carapace length..... *Munida aequalis* n. sp.
- Second abdominal somite with fewer than 5 transverse striae. Cheliped about twice carapace length *Munida militaris* Henderson, 1885
- 14 Inner distal spine of basal antennular segment longer than outer spine *Munida haswelli* Henderson, 1885
- Outer distal spine of basal antennular segment spine longer than inner spine..... 15
- 15 Lateral portion of sternite 7 with patch of granules. Propodus of pereopods 2–3 with spines on extensor margin *Munida spinicruris* n. sp.
- Lateral portion of sternite 7 without patch of granules. Propodus of pereopods 2–3 without spines on extensor margin 16
- 16 Eye small, cornea as broad as or little broader than stalk 17
- Eye large, cornea dilated, distinctly broader than stalk..... 18

- 17 Inner distal spine of second segment of antennal peduncle overreaching distal segment *Munida endeavourae* n. sp.
 – Eye large, cornea dilated, distinctly broader than stalk. Inner distal spine of second segment of antennal peduncle not overreaching third segment
 *M. magniantennulata* Baba & Türkay, 1992
- 18 Eye width greater than one-third distance between anterolateral carapace spines. Inner distal spine of second segment of antennal peduncle overreaching third segment
 *Munida declivis* Baba, 1994
- Eye width less than one-third distance between anterolateral carapace spines. Inner distal spine of second segment of antennal peduncle not overreaching third segment ..
 *Munida isos* n. sp.

***Munida aequalis* n. sp. (Fig. 2)**

Type material. HOLOTYPE: AM P42267, male (23.0 mm), NE of Tweed Heads, Queensland, 27°57'S, 154°03'E, 548 m, K78-23-09, 6 Nov 1978. PARATYPES: AM P42271, 1 male (25.8 mm), SE of Cape Byron, New South Wales, 28°37'S, 153°50'E, 502 m, K78-17-21, 19 Aug 1978; AM P26574, 5 males (18.4–26.0 mm), 2 females (19.1–19.3 mm), E of Woolli, New South Wales, 29°52–51'S, 153°43'E, 503 m, K77-13-10, 23 Aug 1977; AM P31430, 1 female (23.0 mm) with bopyrid, SE of Byron Bay, New South Wales, 28°41–44'S, 153°51'E, 153 m, K78-17-21, 18 Aug 1978; AM P26573, 1 female (22.3 mm), E of Woolli, New South Wales, 29°52–51'S, 153°43'E, 503 m, K77-13-10, 23 Aug 1977; AM P31488, 1 female (25.8 mm), E of Woolli, New South Wales, 29°55'S, 153°42'E, 225 m, K78-06-06, 26 Apr 1978; AM P31428, 4 males (14.0–27.1 mm), 1 female (24.2 mm), NE of Woolli, New South Wales, 29°47–49'S, 153°44–43'E, 437 m, K78-16-07, 2 Aug 1978; AM P31431, 31 males (18.8–31.5 mm), 19 females (20.0–28.5 mm), SE of Cape Byron, New South Wales, 150 m, 28°42'S, 153°51'E, K78-17-21, 18 Aug 1978; AM P42266, 13 males (25.0–29.7 mm), 6 females (23.7–26.7 mm), SE of Yamba, New South Wales, 29°40'S, 153°47'E, 475 m, K78-23-15, 7 Nov 1978.

Diagnosis. Carapace with numerous, closely spaced transverse striae; with transverse row of 8–10 epigastric spines; with paired parahepatic, paired anterior branchial and 1 or 2 pairs of postcervical spines; frontal margins transverse; lateral margins with 2 spines anterior to cervical groove and 5 spines posterior to cervical groove; rostrum spiniform, about twice as long as supraocular spines and about half remaining carapace length. Fourth to sixth thoracic sternites with short striae. Second abdominal tergite with row of 8–14 spines on anterior border. Third to sixth abdominal tergites unarmed. Eyes large, with maximum corneal diameter exceeding one-third basal distance between anterolateral spines. Basal segment of antennule with 2 terminal spines, lengths subequal. Basal segment of antennal peduncle with strong mesial spine. Second segment with mesial distal spine overreaching distal segment of peduncle. Maxilliped 3 ischium with strong distal flexor spine; merus

flexor margin with small distal and larger proximal spine. Cheliped 2.5–3.0 times carapace length. Pereopod 2–3 merus with spinose extensor and flexor margins. Pereopod 4 merus with unarmed extensor margin. Pereopods 2–4 dactylus flexor margin with small movable spines along proximal two-thirds

Description. *Carapace:* Strongly convex; with numerous, closely spaced transverse striae, most of which are uninterrupted; cervical groove distinct; with transverse row of 8–10 epigastric spines, those behind supraocular spines largest; rarely with pair of small protogastric spines; with paired parahepatic, paired anterior branchial and 1 or 2 pairs of post-cervical spines. Intestinal region with interrupted striae or at most with a few scales. Frontal margins transverse; rostrum spiniform, faintly sinuous, about twice as long as supraocular spines and about half remaining carapace length. Supraocular spines subparallel or slightly divergent. Anterolateral spine well developed, situated at anterolateral angle, extending to or slightly beyond sinus between rostrum and supraocular spine. Margins of carapace anterior to cervical groove with 2 spines (including anterolateral); with 5 spines posterior to cervical groove.

Sternum: Fourth to sixth sternites with short striae, only present laterally on sixth sternite; seventh sternite smooth; ridges demarcating fourth to seventh sternites granular.

Abdomen: Second tergite with row of 8–14 spines on anterior border. Third to sixth tergites unarmed. Second to sixth tergites with numerous, closely spaced, transverse striae.

Eye: Large, with maximum corneal diameter exceeding one-third basal distance between anterolateral spines; peduncle with dorsal striae and row of short distal setae ('eyelashes').

Antennule: Basal segment elongate, overreaching cornea; with 2 terminal spines, lengths equal or mesial minutely shorter than lateral; with two lateral spines, distal markedly longer than proximal.

Antenna: Basal segment of peduncle with strong mesial spine. Second segment with mesial and lateral terminal spines, mesial overreaching distal segment of peduncle. Third and fourth segments of antennal peduncle unarmed.

Maxilliped 3: Ischium with strong distal flexor spine. Flexor margin of merus with small distal and larger proximal spine; extensor margin unarmed.

Pereopod 1 (cheliped): 2.5–3.0 times carapace length; squamous and setose, setae densest dorsally. Dactylus usually with 3–5 dorsal spines and small subdistal spine, spines obsolete in some large males; occlusal margin denticulate. Propodus with palm about 3 times as long as high, as long as or slightly shorter than dactylus, upper and outer margin irregularly spinose; pollex with row of ventral spines and small subdistal spine, occlusal margin denticulate. Dactylus and pollex with minor gape in large males. Carpus and merus with irregularly distributed spines on lateral, dorsal and mesial surfaces; spines strongest distally.

Pereopod 2: Merus extensor margin with 9–15 spines; flexor margin with 8–11 spines. Carpus with 2–4 extensor and 2 flexor spines. Propodus extensor margin unarmed; flexor

margin with 8–12 spines. Dactylus about 0.8 propodus length; flexor margin with 6–12 movable spines; distal third unarmed.

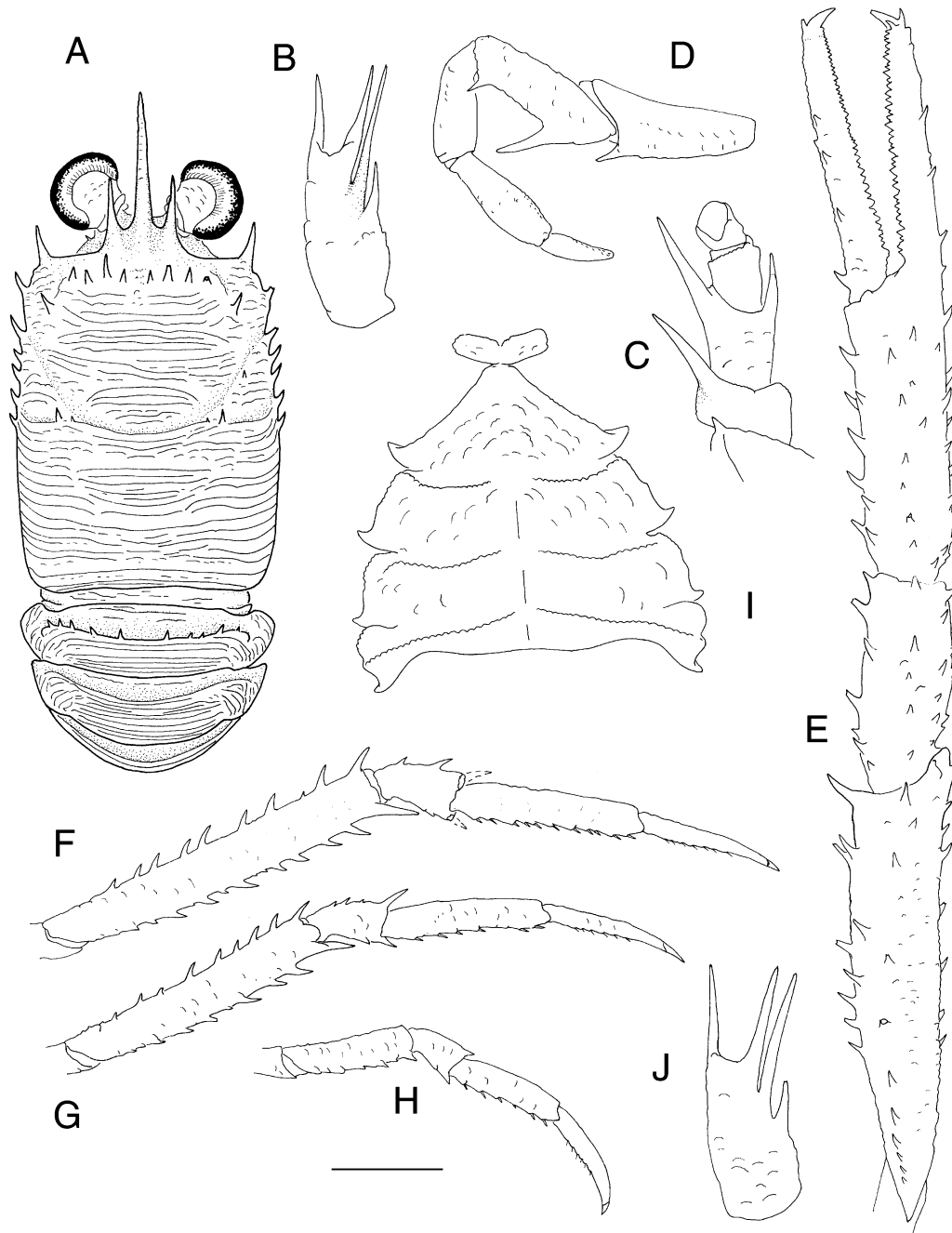


FIGURE 2. *Munida aequalis* n. sp. A–I, holotype male (23.0 mm), AM P42267. J, paratype female (25.8 mm) P31488. A, dorsum. B, left basal antennular segment, ventral. C, left antennal peduncle, ventral. D, left third maxilliped, lateral. E, right cheliped. F–H, right pereopods 2–4, dorsal. I, sternum. J, left basal antennular segment, ventral. Scale A, E–H = 5 mm, B–D, I, J = 2.5 mm.

Pereopod 3: Merus extensor margin with 9 or 10 spines; flexor margin with 6–9 spines. Carpus extensor and flexor margins each with 2 spines. Propodus extensor margin unarmed; flexor margin with 7–9 spines. Dactylus about 0.8 propodus length; flexor margin with 5 or 6 movable spines; distal third unarmed.

Pereopod 4: Merus extensor margin with 2 or 3 small denticles proximally; flexor margin with 2 or 3 spines on distal third. Carpus extensor and flexor margins each with distal spine. Propodus extensor margin unarmed; flexor margin with 3–6 movable spines. Dactylus as long as propodus; with 4 or 5 flexor movable spines; distal third unarmed.

Etymology. Named *aequalis*, Latin, meaning ‘like’ or ‘same’, alluding to the similarly sized terminal spines of the basal antennular segment.

Remarks. *Munida aequalis* n. sp. closely resembles *M. pagesi* Macpherson, 1994 from New Caledonia and the Loyalty Islands in almost every respect, but differs in the following features: the mesial terminal spine of the basal antennular segment is subequal to, instead of distinctly shorter than, the lateral distal spine; the carapace bears very few scales, whereas numerous scales are present anterolaterally and on the intestinal region in *M. pagesi*; and the sixth thoracic sternite bears striae on the lateral portions.

In general habitus, *M. aequalis* resembles *M. haswelli* Henderson, 1885 and *M. chydadae* n. sp., both known from off central and southern New South Wales. *Munida haswelli* and *M. chydadae* are both readily distinguished from *M. aequalis* by having the mesial terminal spine of the basal antennular segment distinctly longer than the outer terminal spine.

A female specimen (23 mm cl., AM P31430), is infected with a bopyrid isopod on its left side. The bopyrid is registered in the Australian Museum collection as P31432.

Distribution. Northeast of Tweed Heads, southern Queensland, to the vicinity of Wooli, New South Wales, at depths of 150–548 m.

Munida asprosoma n. sp. (Fig. 3)

Munida militaris. — Jones & Morgan, 2002: 135 [colour figure] [not *M. militaris* Henderson, 1885].

(?)*Munida microps*. — Baba, 1994: 13. — Davie, 2002: 65 [part] [not *M. microps* Alcock, 1894].

Type material. HOLOTYPE: AM P26795, female (26.2 mm), E of Broken Bay, New South Wales, 33°35–33’S, 152°00–02’E, 823 m, trawl, K77-23-12, 8 Dec 1977. PARATYPES: AM P26790, 2 males (21.0–29.0 mm), E of Broken Bay, New South Wales, 33°35–33’S, 152°00–02’E, 823 m, trawl, K77-23-12, 8 Dec 1977.

Other material examined. QUEENSLAND: AM P67050, 1 ovigerous female (19.0 mm), E of Yule Entrance, Coral Sea, 10°37.17’S, 144°21.99’E, 990–1053 m, from gullet of fish (*Ventrifussa* sp., AM I32439-0030, E stn 5, 21 Aug 1988.

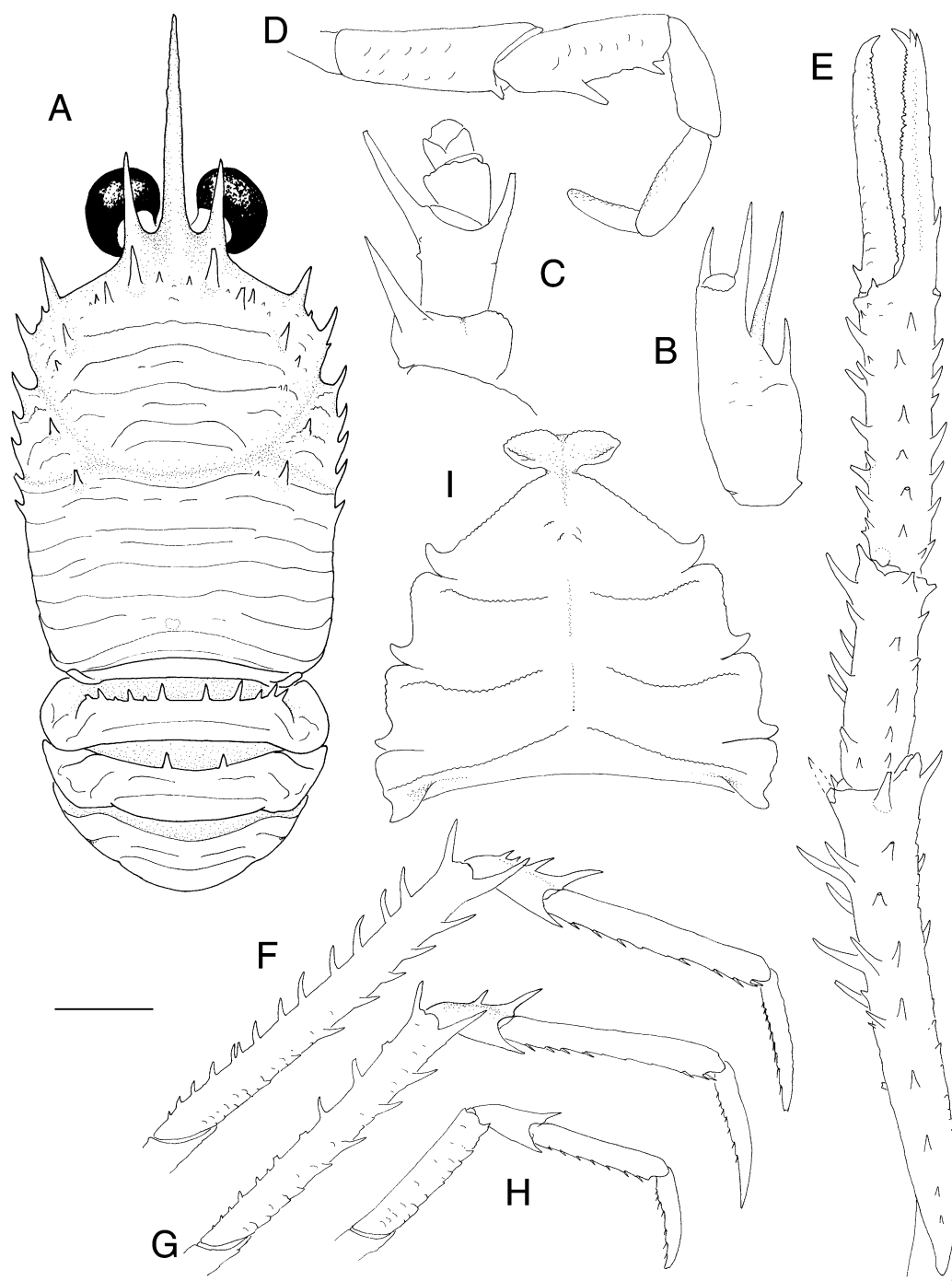


FIGURE 3. *Munida asprosoma* n. sp., holotype female (26.2 mm), AM P26795. A, dorsum. B, left basal antennular segment, ventral. C, left antennal peduncle, ventral. D, right third maxilliped, lateral. E, right cheliped. F–H, right pereopods 2–4, dorsal. I, sternum. Scale A, E–H = 4 mm, B–D, I = 2 mm.

Diagnosis. Carapace with frontal margins oblique; transverse striae widely spaced; with 4 or 5 pairs of epigastric spines in addition to smaller scattered spinules; with paired parahepatic, paired anterior branchial and paired postcervical spines; frontal margins oblique; lateral margins of carapace with 5 spines posterior to cervical groove. Rostrum spiniform. Fourth thoracic sternite with several short, granular striae, other sternites smooth. Second abdominal tergite with row of 7–11 spines on anterior border. Third abdominal tergite with pair of submedian spines on anterior border. Eyes large, with maximum corneal diameter slightly less than one-third basal distance between anterolateral spines. Basal segment of antennule with 2 terminal spines, outer longer. Basal segment of antennal peduncle with strong mesial spine. Second segment with mesial distal spine overreaching distal segment of peduncle. Maxilliped 3 ischium with small distal flexor spine; merus flexor margin with distal and proximal spine, proximal largest. Cheliped slender, elongate, about 2–3 times carapace length; spinous and sparsely setose; ventral margin of pollex with proximal spine. Pereopod 2–3 merus with spinose extensor and flexor margins. Pereopod 4 merus with unarmed extensor margin. Pereopods 2–4 dactylus with movable spines along proximal 0.8 of flexor margin.

Description. *Carapace:* Transverse ridges mostly uninterrupted; few secondary striae; cervical groove distinct; with 4 or 5 pairs of epigastric spines in addition to smaller scattered spinules; with paired parahepatic, paired anterior branchial and paired postcervical spines. Frontal margins oblique; rostrum spiniform, faintly upcurved, more than twice as long as supraocular spines and about half remaining carapace length. Supraocular spines subparallel or slightly divergent. Anterolateral spine well developed, situated at anterolateral angle, not extending to sinus between rostrum and supraocular spine. Margins of carapace anterior to cervical groove with 2 large spines (including anterolateral) and 0–2 spinules; with 5 spines posterior to cervical groove.

Sternum: Fourth sternite with several short, granular striae; fifth to seventh sternites smooth; ridges demarcating fourth to seventh sternites feebly granular.

Abdomen: Second tergite with row of 7–11 spines on anterior border. Third tergite with pair of submedian spines on anterior border. Second tergite with uninterrupted transverse stria and several short striae laterally. Third and fourth tergites with interrupted and uninterrupted transverse striae and several short striae laterally.

Eye: Large, with maximum corneal diameter slightly less than one-third basal distance between anterolateral spines.

Antennule: Basal segment elongate, overreaching cornea; with 2 terminal spines, outer longer; with two lateral spines, distal markedly longer than proximal.

Antenna: Basal segment of peduncle with strong mesial spine. Second segment with mesial and lateral terminal spines, mesial overreaching distal segment of peduncle. Third and fourth segments unarmed.

Maxilliped 3: Ischium with small distal flexor spine. Flexor margin of merus with distal and proximal spine, proximal largest; extensor margin unarmed.

Pereopod 1 (cheliped): Slender, about twice carapace length; spinous and sparsely setose. Dactylus with small dorsal proximal spine; without subterminal spines; occlusal margin denticulate. Propodus with palm about 4–5 times as long as high, slightly longer than dactylus, upper outer and lower margins spinose. Pollex with 2 subterminal spines, occlusal margin denticulate; ventral margin with proximal spine. Carpus and merus with long spines on lateral, dorsal and mesial surfaces; spines strongest dorsally and distally.

Pereopod 2: Merus extensor margin with 12–14 spines; flexor margin with 5 or 6 spines. Carpus with 2–4 extensor and 1 flexor spine. Propodus flexor margin with 7 or 8 movable spines. Dactylus about 0.6 propodus length; flexor margin with 9 movable spines.

Pereopod 3: Merus extensor margin with 9–12 spines; flexor margin with 4 or 5 spines. Carpus with 2 extensor and 1 flexor spine. Propodus flexor margin with 7–9 movable spines. Dactylus about 0.6 propodus length; flexor margin with 7 or 8 movable spines.

Pereopod 4: Merus extensor margin with unarmed; flexor margin with distal spine. Carpus extensor and flexor margins each with distal spine. Propodus flexor margin with 5–7 movable spines. Dactylus about 0.7 propodus length; flexor margin with 5–7 movable spines.

Etymology. Derived from the Greek *aspros* and *soma*, meaning ‘white body’ in reference to the pale colour of the species.

Remarks. *Munida asprosoma* n. sp. closely resembles *M. vigiliarum* Alcock, 1901 from the Andaman Sea in most respects including the widely spaced dorsal striae, dorsal and lateral carapace spination, and spination of the second and third abdominal tergites. *Munida asprosoma* is readily distinguished by the lengths of the terminal spines on the basal antennular segment (mesial shorter than instead of subequal to the lateral), in having two instead of one ventral spines on the merus of the third maxilliped, and in having distinctly oblique instead of relatively transverse frontal carapace margins. Jones & Morgan (2002) figured the holotype of *M. asprosoma* in colour (mis-captioned as *M. militaris*); it is creamy-white in life.

Baba (1994) reported two juvenile Queensland specimens as *M. microps*, but noted the presence of larger eyes and a pair of anterior spines on the third abdominal somite. These aforementioned characters are inconsistent with *M. microps* sensu stricto. Baba’s specimens are perhaps referable to *M. asprosoma*. *Munida asprosoma* shares with *M. microps* the proximoventral spine on the pollex of the cheliped, and will key out to the latter according to the key to species given by Baba (1988) (if eye-size were not considered) and Macpherson (1994). *Munida asprosoma* is readily distinguished from *M. microps* by the larger, broader eyes, and pair of anterior spines on the second abdominal somite. The identity of Baba’s (1994) specimens require verification, but they are probably not referable to *M. microps*.

Distribution. Coral Sea, Queensland, and Broken Bay, New South Wales, at depths between 823 and 990–1053 m.

***Munida chydæa* n. sp. (Fig. 4)**

Munida haswelli. — Haig, 1973: 273–274 [part, not *M. haswelli* Henderson, 1885].

Type material. HOLOTYPE: AM P20669, female (36.2 mm), E of Brush Island, New South Wales, 35°28–34'S, 150°48–45'E, 467–448 m, K75-02-09, K. Graham. PARATYPES: AM P61823, 1 female (33.0 mm), SE of Ulladulla, New South Wales, 35°34'S, 150°45'E, 543–560 m, K96-24-03, 11 Dec 1996; AM P17961, 1 male (32.2 mm), E of Brush Island, New South Wales, 423–405 m, 35°31–37'S, 150°45–42'E, K71-11-10, 8 Jul 1971; AM P67289, 1 female (33.1 mm), E of Brush Island, New South Wales, 35°31–28'S, 150°45–47'E, 412 m, K77-21-04, 22 Nov 1977; AM P67299, 1 female (32.0 mm), E of Batemans Bay, New South Wales, 35°40'S, 150°41'E, 541–585 m, K96-23-04, 4 Dec 1996; AM P31493, 1 male (26.4 mm), E of Brush Island, New South Wales, 35°32'S, 150°46'E, 458 m, K77-21-03, 22 Nov 1977; AM P25063, 2 males (34.9–40.0 mm), E of Batemans Bay, New South Wales, 35°32–42'S, 150°39–45'E, 384 m, K76-21-11/12, 25 Nov 1976; AM P61120, 3 males (34.0–45.7 mm), off Bermagui, New South Wales, 36°12'S, 150°23'E, 348 m, 17 Feb 2000.

Other material examined. NEW SOUTH WALES: AM P53250, 1 female (31.0 mm), E of Broken Bay, 33°34'S, 152°02'E, 662 m, K86-01-06, 11 Feb 1986; AM P21013, 1 ovigerous female (27.1 mm), E of Broken Bay, 33°25–30'S, 152°03–07'E, 641 m, K75-05-04, 19 Aug 1975; AM P66656, 1 female (31.0 mm), E of Port Jackson, 33°49'S, 151°54'E, 450 m, 5 May 1978; AM P66653, 2 males (31.5–32.0 mm), 1 female (32.8 mm), NE of Wollongong, 34°18'S, 151°26'E, 457–467 m, K75-05-06, 20 Aug 1975; AM P21105, 1 male (28.0 mm), 2 ovigerous females (31.1–31.6 mm), NE of Wollongong, 34°16–22'S, 151°26–23'E, 366 m, K75-05-01, 8 Aug 1975; AM P31503, 1 female (34.9 mm), NE of Wollongong, 439 m, K78-08-02, 24 May 1978; AM P21055, 1 male (35.0 mm), 5 ovigerous females (27.0–34.1 mm), NE of Wollongong, 34°21–14'S, 151°24–28'E, 403 m, K75-05-02, 8 Aug 1975; AM P21052, 5 males (24.0–39.1 mm), 6 females (2 ovigerous) (24.0–34.1 mm), E of Port Kembla, 34°28–34'S, 151°19–17'E, 412 m, K75-05-07, 20 Aug 1975; AM P19392, 2 males (23.9–30.6 mm), E of Kiama, 34°40–45'S, 151°14–12'E, 378–342 m, K71-11-02, 6 Jul 1971; AM P20747, 1 female (26.0 mm), E of Kiama, 34°38–46'S, 151°15–13'E, 458–439 m, K75-02-17, 30 Jun 1975; AM P20746, 1 female (36.1 mm), E of Shoalhaven, 34°49–56'S, 151°10–09'E, K75-01-18, 30 Jun 1975; AM P31487, 7 males (23.5–32.8 mm), 6 females (23.1–30.0 mm), E of Beecroft Head, 35°00'S, 151°07'E, 414 m, K79-03-18, 26 Apr 1979; AM P53246, 1 male (28.4 mm), E of Shoalhaven River, 32°02'S, 151°06'E, 366 m, K79-11-09, 9 Aug 1979.

VICTORIA: AM E4781, 1 male (23.3 mm), off Gabo Island, 146–183 m, 1913; AM P61122, 1 male (33.8 mm), SE of Gabo Island, 37°41'S, 150°15'E, 384 m, K77-10-06, 13 Jul 1977; AM P20805, 1 female (12.4 mm), SE of Gabo Island, 37°45–38'S, 150°12–16'E, 403–439 m, K75-03-02, 10 Jul 1975; AM P20812, 1 male (25.4 mm), SE of Gabo Island, 37°36–40'S, 150°15–14'E, 348–366 m, K75-03-03, 11 Jul 1975; AM P61821, 2 males

(35.0–38.0 mm), SE of Gabo Island, 37°38'S, 150°14'E, 322–331 m, K96-12-05, K, Graham, 24 Jul 1996; AM P61822, 2 males (24.1–28.0 mm), 2 females (21.9–31.0mm), SE of Gabo Island, 37°38–40'S, 150°14–13'E, 316–327 m, K96-21-03, 22 Oct 1996; AM P61824, 1 female (27.5 mm), off Gabo Island, 37°39'S, 150°16'E, 437–444 m, K97-01-18, 29 Apr 1997; AM P61820, 2 females (19.0–31.6 mm), SE of Gabo Island, 37°39'S, 150°16'E, 448 m, K96-21-18, 31 Oct 1996; AM P61123, 1 male (34.9 mm), off Portland, 38°30'S, 141°45'E, 403 m, 13 Nov 1999; NMV J52076, 1 male (26.0 mm), 38°12.57'S, 149°37.33'E, 382 m, SS01/00/184, 21 Apr 2000; NMV J52047, 2 males (18.0–21.5 mm), 38°13.78'S, 149°36.99'E, 435 m, SS01/00/197, 22 Apr 2000; NMV J52048, 6 males (17.0–32.0 mm), 1 female (16.0 mm), 38°15.07'S, 149°38.65'E, 525 m, SS01/00/241, 26 Apr 2000; NMV J52052, 2 males (13.5–19.8 mm), 3 females (22.2–28.2 mm), 38°14.73'S, 149°42.01'E, 503 m, SS01/00/188, 21 Apr 2000; NMV J52049, 2 males (14.5–21.0 mm), 6 females (19.4–27.0 mm), 38°14.91'S, 149°38.67'E, 500 m, SS01/00/187, 21 Apr 2000.

TASMANIA: AM E5175, 3 males (14.9–31.1mm), 5 females (19.0–33.7 mm), ENE of Maria Island, 232–329 m, 1914; AM P60188, 1 male (34.0 mm), E of Fortescue Bay, 43°07.36'S, 145°13.75'E, 400 m, TAS-381, J. Lowry *et al.*, 17 Apr 1993; AM P60189, 1 female (17.8 mm), E of Fortescue Bay, 43°07.36'S, 145°13.75'E, 400 m, TAS-416, J. Lowry *et al.*, 9 Apr 1993; AM P60191, 1 female (28.8 mm), E of Fortescue Bay, 43°09.39'S, 145°13.60'E, 300 m, TAS-397, J. Lowry *et al.*, 8 Apr 1994; AM E5154, 2 females (26.9–33.1 mm), 56.3 km SE of Bruny Island, D'Entrecasteaux Channel, 275–421 m, 1914; SAM C6057, 2 males (38.0–36.5 mm), 22.2 km ESE of Mistaken Cape, Maria Island, 42°42'S, 148°25'E, 338–700 m, epibenthic sled, SS06/96/241, 18 Dec 1996; SAM C6058, 32 males (7.6–29.8 mm), 37 females (10.5–31.5 mm), 38.9 km W of Granville Harbour, 41°51'S, 149°33'E, 425 m, epibenthic sled, W. Zeidler, 20 Oct 1984.

SOUTH AUSTRALIA: AM E3688, 1 male (42.0 mm), Great Australian Bight, ESE of Eucla, 126°45'E, 457–548 m, FIS *Endeavour*, 1909–1914.

Diagnosis. Carapace with oblique frontal margins; transverse ridges closely spaced, mostly uninterrupted; with pair of epigastric spines followed by pair of protogastric spines and numerous spinules on anterior quarter of carapace in addition to paired parahepatic, paired anterior branchial and paired postcervical spines. Rostrum spiniform, about two-thirds remaining carapace length. Margins of carapace with 5 spines posterior to cervical groove. Fourth and fifth sternites with several short, granular striae; sixth and seventh sternites smooth. Second tergite with row of 8–11 spines on anterior border. Third tergite with 1 or 2 (usually 2) submedian spines on anterior border. Eyes large, with maximum corneal diameter about one-third basal distance between anterolateral spines. Antennular basal segment elongate with distomesial spine longer than distolateral spine. Antennal basal segment of peduncle with strong mesial spine; second segment with spine on mesial margin, and with mesial and lateral terminal spines, mesial overreaching distal segment of peduncle; third segment with 2 outer spinules; fourth segment with 1 outer spinule. Cheliped

slender, 2–3 times carapace length. Pereopod 2–4 merus with spinose extensor and flexor margins; dactylus with ventral movable spines on proximal three-quarters.

Description. *Carapace*: Transverse ridges closely spaced, mostly uninterrupted; cervical groove distinct; with pair of epigastric spines followed by pair of protogastric spines; with numerous spinules on anterior quarter of carapace in addition to paired parahepatic, paired anterior branchial and paired postcervical spines. Frontal margins oblique; rostrum spiniform, faintly upcurved, about twice as long as supraocular spines and about two-thirds remaining carapace length. Supraocular spines subparallel or slightly divergent. Anterolateral spine well developed, situated at anterolateral angle, extending to or slightly beyond sinus between rostrum and supraocular spine. Margins of carapace anterior to cervical groove with 2 or 3 spines (including anterolateral) and 1 or 2 spinules; with 5 spines posterior to cervical groove.

Sternum: Fourth and fifth sternites with several short, granular striae; sixth and seventh sternites smooth; ridges demarcating fourth to seventh sternites feebly granular.

Abdomen: Second tergite with row of 8–11 spines on anterior border. Third tergite with 1 or 2 (usually 2) submedian spines on anterior border. Second and third tergites with 5 uninterrupted transverse striae. Fourth tergite with 2 uninterrupted transverse striae alternating with 2 medially interrupted striae.

Eye: Large, with maximum corneal diameter about one-third basal distance between anterolateral spines; peduncle with row of short distal setae ('eyelashes').

Antennule: Basal segment elongate, overreaching cornea; with 2 terminal spines, mesial longer; with two lateral spines, distal markedly longer than proximal.

Antenna: Basal segment of peduncle with strong mesial spine. Second segment with spine on mesial margin and with mesial and lateral terminal spines, mesial overreaching distal segment of peduncle; outer margin with 1 or 2 short striae. Third segment of antennal peduncle with 2 outer spinules; fourth segment with 1 outer spinule.

Maxilliped 3: Ischium with strong distal flexor spine. Flexor margin of merus with distal and proximal spine, proximal largest; extensor margin unarmed.

Pereopod 1 (cheliped): Slender, 2–3 times carapace length; squamous and setose, setae densest dorsally. Dactylus with small dorsal proximal spine and 2 or 3 small subterminal spines; occlusal margin denticulate. Propodus with upper and outer margin spinose; palm about 5 times as long as high, longer than pollex; pollex with 2 or 3 subterminal spines, dorsally unarmed, occlusal margin denticulate. Carpus and merus with irregularly distributed spines on lateral, dorsal and mesial surfaces; spines strongest distally.

Pereopod 2: Merus extensor margin with 7–12 spines; flexor margin with 4–6 ventral spines. Carpus with 3–6 extensor and 1 flexor spine. Propodus flexor margin with 12–15 spines. Dactylus half to two-thirds propodus length; flexor margin with 12–17 movable spines; terminal quarter unarmed.

Pereopod 3: Merus extensor margin with 7–11 spines; flexor margin with 4–7 spines. Carpus with 2–5 extensor and 1 flexor spine. Propodus flexor margin with 10–15 spines.

Dactylus half to two-thirds propodus length; flexor margin with 10–17 movable spines; terminal quarter unarmed.

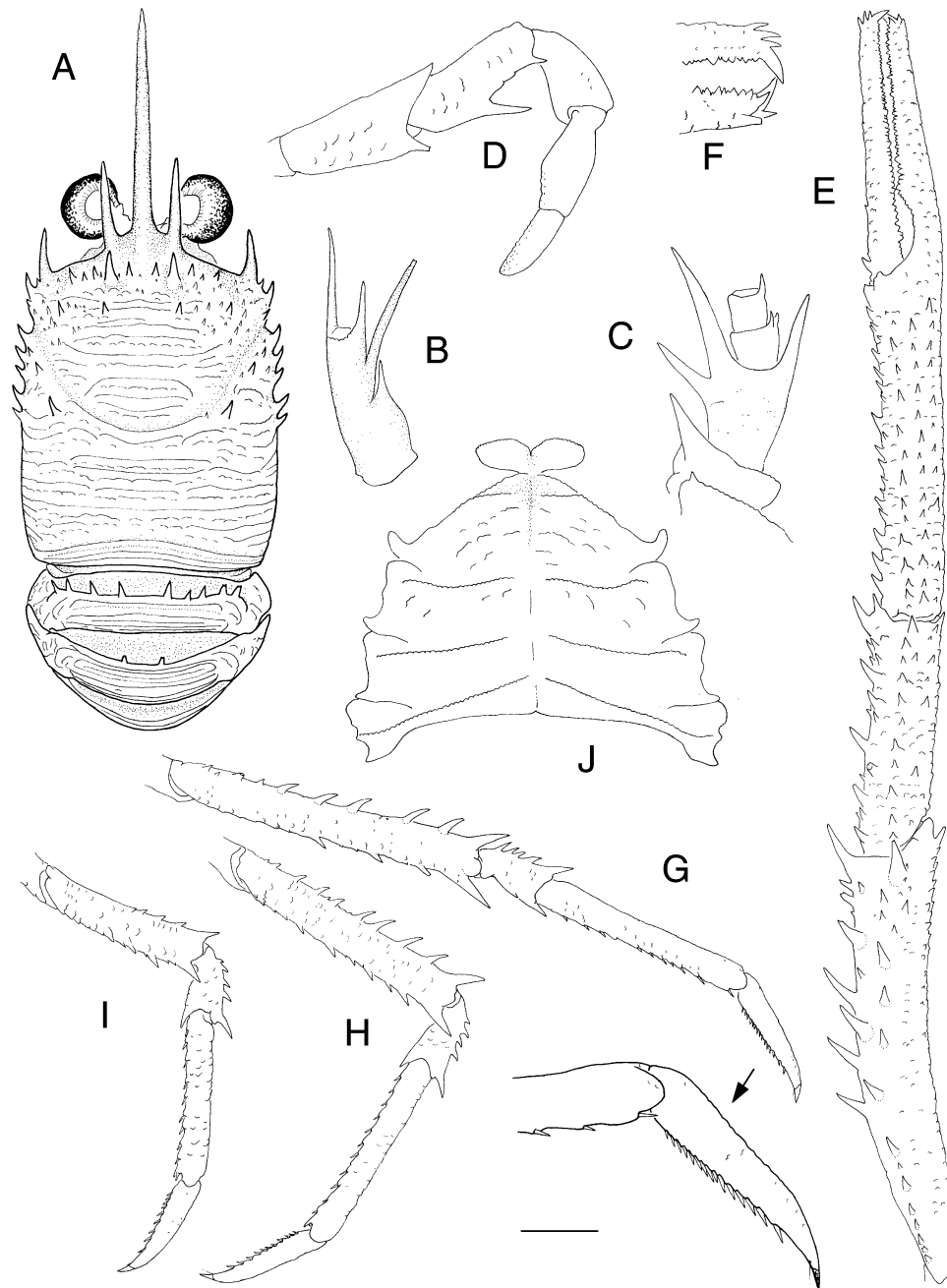


FIGURE 4. *Munida chydaea* n. sp., holotype female (36.2 mm), AM P20669. A, dorsum. B, left basal antennular segment, ventral. C, left antennal peduncle, ventral. D, right third maxilliped, lateral. E, right cheliped. F, right cheliped, distal portion. G–I, right pereopods 2–4, dorsal. J, sternum. Scale A, E, G–I = 5 mm, B–D, F, J = 2.5 mm.

Pereopod 4: Merus extensor margin with 1–4 spines; flexor margin with 2 or 3 spines on distal third. Carpus with 2–5 extensor and 1 flexor spine. Propodus flexor margin with 7–12 spines. Dactylus half to three-quarters propodus length; flexor margin with 8–12 movable spines; terminal quarter unarmed.

Etymology. Derived from the Latin *chydaeus*, meaning ‘abundant,’ alluding to the abundance of the present species.

Remarks. *Munida chydaea* n. sp. most closely resembles *M. gracilis* Henderson, 1885 from eastern New Zealand but differs in the following features: the flexor margin of the dactylus of the first walking leg is unarmed for the distal quarter instead of distal third; the third and fourth antennal segments bear an outer spinule; the anterior margin of the third abdominal tergite bears 1 or 2 (usually 2) instead of 4 spines; and the second and third abdominal tergites bear more numerous transverse striae. Although the number of transverse striae on the abdominal tergites increases with size, the smallest specimen of *M. chydaea* (cl. 12.4 mm, ocl. 6.7 mm) bears 2 and 3 instead of 1 and 2 striae on the second and third tergites respectively as in the syntype of *M. gracilis* (ocl. 6.8 mm) figured by Macpherson (1994: fig. 19).

The present specimens are similar but differ chiefly in the degree of spination on the anterior portion of the carapace, and in setation and size of spines on the pereopods. The number of spinules on the anterior portion of the carapace between and adjacent to the epigastric and protogastric spines increases with size. Similarly, the setation of the pereopods is densest in the largest specimens and the relative size of the spines decreases with increasing size. Additional variation is present in the following features: the first segment of the antennal peduncle usually bears short striae, of which one is occasionally produced to a minute spinule; the third segment of the antennal peduncle usually bears 2 small outer distal spinules, but the dorsalmost of these may be obsolete or present as a tubercle; the number of spines on the anterior margin of the second abdominal tergite varies from 8–11.

Munida chydaea is frequently sympatric with *M. haswelli* with which it has sometimes been misidentified. The two species are most readily distinguished by the spination of the anterior margin of the third abdominal tergite and presence of numerous short striae on the thoracic sternites in *M. haswelli*. In *M. chydaea*, the few short striae that are present are restricted to the fourth and fifth sternites. *Munida chydaea* also appears to attain a larger body size than *M. haswelli*. The largest specimen of *M. haswelli* that we have examined measures 21.6 mm cl., whereas *M. chydaea* attains approximately twice that size. Additionally, *M. haswelli* is ovigerous by 13.2 mm cl., whereas the smallest ovigerous specimen of *M. chydaea* is 27.0 mm cl.

Distribution. Sydney area to Victoria, Tasmania and the Great Australian Bight at 146–700 m depth.

***Munida endeavourae* n. sp. (Fig. 5)**

Munida microps. — Haig, 1973: 271–273, fig. 1 [part, larger specimen only]. — Davie, 2002: 65 [part]. [Not *M. microps* Alcock, 1894].

Type material. HOLOTYPE: AM E3142, male (24.0 mm), 51 km SE of Green Cape, New South Wales, 37°30'S, 150°33'E, 860 m, FIS *Endeavour*, 2 Oct 1912. PARATYPES: NMV J17074, 2 males (12.9–22.6 mm), S of Point Hicks, Victoria, 38°19.6'S, 149°24.3'E, 930 m, rock, rubble clay, sand, SLOPE 33, M. Gomon *et al.*, 23 Jul 1986; NMV J23881, 1 female (10.8 mm), S of Point Hicks, Victoria, 38°19.6'S, 149°24.3'E, 930 m, rock, rubble clay, sand, SLOPE 33, M. Gomon *et al.*, 23 Jul 1986; NMV J17097, 2 females (9.0–9.2 mm), S of Point Hicks, Victoria, 38°19.6'S, 149°24.3'E, 930 m, rock, rubble clay, sand, SLOPE 33, M. Gomon *et al.*, 23 Jul 1986; NMV J17084, 1 ovigerous female (not measured), S of Point Hicks, Victoria, 38°25.00'S, 149°0.00'E, 1500 m, compacted clay, epibenthic sled, SLOPE 27, G. Poore *et al.*, 22 Jul 1986; NMV J16030, 4 females (14.5–20.4 mm), S of Point Hicks, Victoria, 38°21.90'S, 149°20.00'E, 1000 m, epibenthic sled, SLOPE 32, G. Poore *et al.*, 23 Jul 1986; NMV J52073, 1 female (21.4 mm), Victoria, 38°27.64'S, 149°31.58'E, 1500 m, SS01/00/154, 17 Apr 2000; NMV J17075, 2 males (15.4–26.0 mm), 1 ovigerous female (15.0 mm), 63 km S of Point Hicks, Victoria, 38°22.61'S, 149°20.20'E, 1169 m, beam trawl, G. Poore *et al.*, 25 Oct 1988; NMV J52074, 1 male (11.8 mm), Victoria, 38°20.24'S, 149°38.53'E, 1000 m, SS01/00/152, 17 Apr 2000; SAM C6076, 1 male (19.5 mm), 91 km NW of Currie Harbour, Tasmania, 39°43.09'S, 143°00.57'E, 1135 m, 5 Mar 1989; SAM C6075, 1 male (26.2 mm), 79 km SE of South East Cape, Tasmania, 44°09.2'S, 147°31.8'E, 970–1120 m, FV *Belinda*, K. Gowlett-Holmes, 1 Feb 1992.

Other material. NMV J41571–41590, J41619–41622, J52080, 110 specimens, sea-mounts SSE of South East Cape, Tasmania, 620–1700 m; NMV J52075, J52077–52079, J52081, 15 specimens, S of Point Hicks, Victoria, 998–1608 m.

Diagnosis. Carapace with slightly oblique frontal margins; transverse striae widely spaced, mostly uninterrupted; with transverse row of 4–6 epigastric spines; with 0–3 minute spinules behind epigastric spines; with 0–1 minute parahepatic spinules, 1–3 pairs of anterior branchial and 1 or 2 pairs of postcervical spines. Rostrum spiniform. Supraocular spines divergent. Margins of carapace with 5 spines posterior to cervical groove. Fourth sternite at most with 2 or 3 short striae; fifth to seventh sternites smooth. Second tergite with row of 8–11 spines on anterior border. Remaining tergites unarmed. Eyes small, scarcely wider than stalk; with maximum corneal diameter not exceeding one-fifth basal distance between anterolateral spines. Basal antennular segment elongate, overreaching cornea; with 2 terminal spines, mesial shorter. Basal segment of antennal peduncle with strong mesial spine; second segment with mesial distal spine distinctly overreaching distal segment of peduncle; lateral distal spine distinctly overreaching penultimate segment of peduncle. Maxilliped 3 ischium with 1 or 2 small distal flexor spines; merus flexor margin

with 2 or 3 spines. Cheliped slender, about three times carapace length; pollex without ventral spines. Pereopod 2–3 merus with spinose extensor and flexor margins. Pereopod 4 merus with unarmed extensor margin. Pereopods 2–4 dactylus with movable spines along entire length of flexor margin.

Description. *Carapace*: Transverse striae widely spaced, mostly uninterrupted; cervical groove distinct; with transverse row of 4–6 epigastric spines; with 0–3 minute spinules behind epigastric spines; with or without minute parahepatic spinule, 1–3 pairs of anterior branchial and 1 or 2 pairs of postcervical spines. Frontal margins slightly oblique; rostrum spiniform, faintly upcurved, about twice as long as supraocular spines. Supraocular spines divergent, dorsally deflected. Anterolateral spine well developed, situated at anterolateral angle, not extending to sinus between rostrum and supraocular spine. Margins of carapace anterior to cervical groove with 2 or 3 spines (including anterolateral); with 5 spines posterior to cervical groove.

Sternum: Fourth sternite at most with 2 or 3 short striae; fifth to seventh sternites smooth; ridges demarcating fourth to seventh sternites feebly granular.

Abdomen: Second tergite with row of 8–11 spines on anterior border. Remaining tergites unarmed. Second to third tergites with 1 uninterrupted transverse stria. Fourth tergite with 2 uninterrupted transverse striae.

Eye: Small, scarcely wider than stalk; with maximum corneal diameter not exceeding one-fifth basal distance between anterolateral spines.

Antennule: Basal segment of antennule elongate, overreaching cornea; with 2 terminal spines, mesial shorter; with two lateral spines, distal markedly longer than proximal.

Antenna: Basal segment of antennal peduncle with strong mesial spine. Second segment with mesial distal spine distinctly overreaching distal segment of peduncle; lateral distal spine distinctly overreaching penultimate segment of peduncle.

Maxilliped 3: Ischium with 1 or 2 small distoventral spines. Ventral margin of merus with 2 or 3 ventral spines; distal spine and proximal spine largest, median small or absent; extensor margin unarmed.

Pereopod 1 (cheliped): Slender, about three times carapace length; finely setose, and spinose. Dactylus with dorsal proximal spine; occlusal margin denticulate, with blunt proximal projection. Propodus upper and outer margin spinose; palm about five times as long as high, longer than pollex; pollex with 2 subterminal spines, occlusal margin denticulate, ventral margin unarmed. Carpus and merus with irregularly distributed spines on lateral, dorsal and mesial surfaces.

Pereopod 2: Merus extensor margin with 7–9 spines; flexor margin with 6–9 spines. Carpus with 2 or 3 extensor and 1 flexor spine. Propodus flexor margin with 8 spines. Dactylus slightly exceeding half propodus length; flexor margin with 12–14 movable spines along entire length.

Pereopod 3: Merus extensor margin with 6–8 spines; flexor margin with 5–7 spines. Carpus with 2 extensor and 1 flexor spine. Propodus flexor margin with 10 spines. Dactylus

lus slightly exceeding half propodus length; flexor margin with 12 movable spines along entire length.

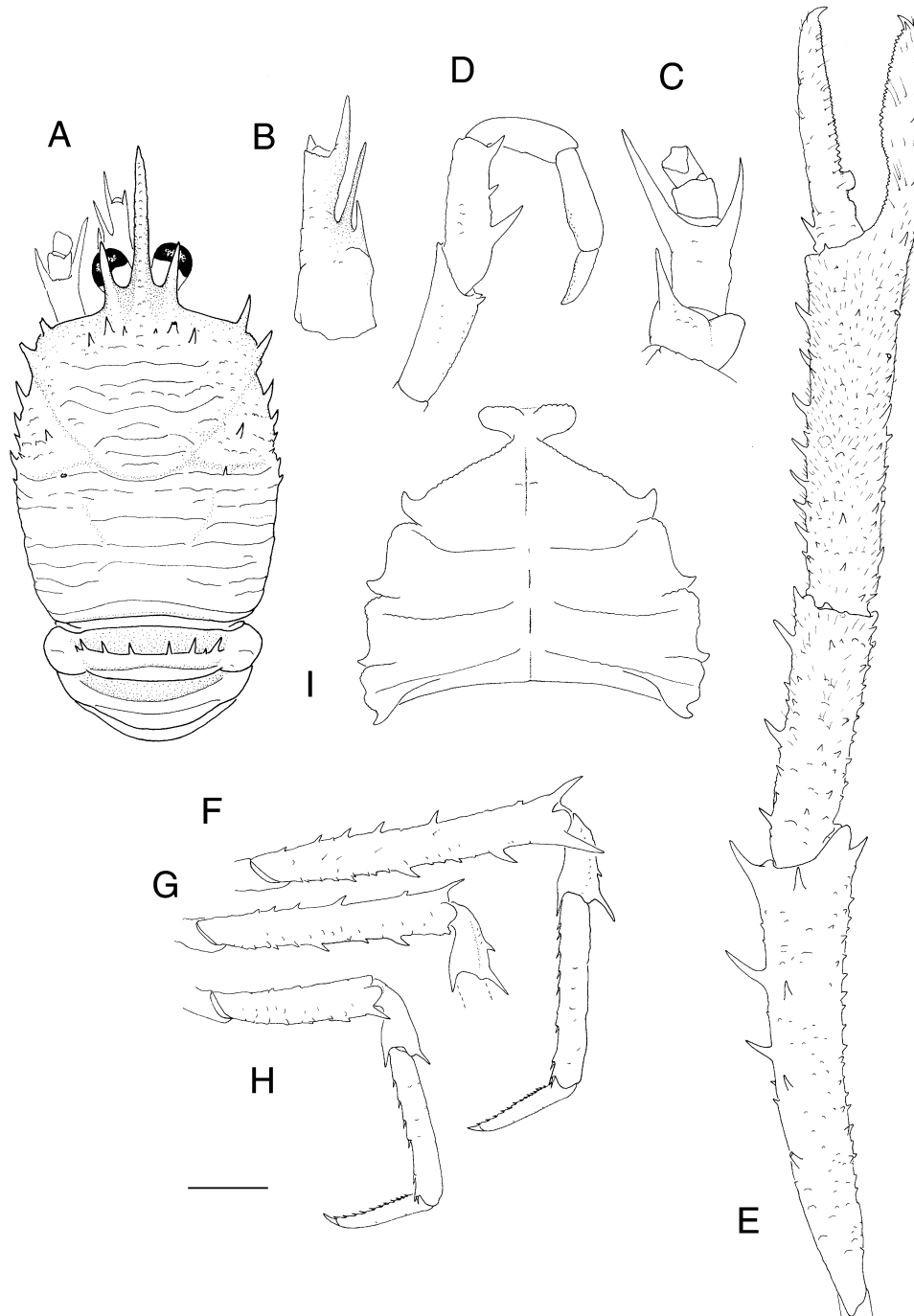


FIGURE 5. *Munida endeavourae* n. sp., holotype male (24.0 mm), AM E3142. A, dorsum. B, left basal antennular segment, ventral. C, left antennal peduncle, ventral. D, right third maxilliped, lateral. E, right cheliped. F–H, right pereopods 2–4, dorsal. I, sternum. Scale A, E–H = 4 mm, B–D, I = 2 mm.

Pereopod 4: Merus extensor margin unarmed dorsally; flexor margin with 2 or 3 small spines and large distal spine. Carpus extensor and flexor margins each with distal spine. Propodus flexor margin with 6 or 7 movable spines. Dactylus about two-thirds propodus length; flexor margin with 10 or 11 movable spines along entire length.

Etymology. Named for the FIS *Endeavour*, from which the holotype was collected.

Remarks. *Munida endeavourae* n. sp. closely resembles *M. microps* Alcock, 1894, described from the Andaman Sea, in the small eyes, spination and ornamentation of the carapace, abdomen and walking legs. The new species differs from *M. microps* in lacking the strong spine on the ventral border of the pollex and in having distinctly longer terminal spines on the second antennal segment. In *M. endeavourae*, the mesial distal spine of the second antennal segment markedly overreaches the fourth (distal) antennal segment and the lateral distal spine distinctly overreaches the third antennal segment. Conversely, in *M. microps*, the mesial distal spine of the second antennal segment reaches the end of the fourth (distal) antennal segment, and the lateral distal spine does not overreach the third antennal segment. Of the known Australian species, *M. endeavourae* most closely resembles *M. isos*; characters distinguishing the two species are outlined under the account of the latter.

Haig (1973) first reported *Munida endeavourae* from Australia as *M. microps*. *Munida microps* reported from New Caledonia and the Philippines by Macpherson (1994) is not conspecific with either *M. endeavourae* or *M. isos* n. sp. Macpherson's (1994) specimens differ from *M. endeavourae* in having a dilated cornea, from *M. isos* in having much longer terminal spines on the second antennal segment, and from both *M. endeavourae* and *M. isos* in having a distinct spine on the ventral margin of the pollex of the cheliped. Macpherson's (1994) *M. microps* probably represents an undescribed species.

Distribution. Southeastern Australia from southeast of Green Cape to Tasmania at depths of 620–1700 m.

Munida gregaria (Fabricius, 1793)

Galathea gregaris Fabricius, 1793: 473 [type locality: south Atlantic Ocean, 37°30'S].

Munida gregaria. — Davie, 2002: 63–64.

Galathea subrugosa White, 1847: 66 [*nomen nudum*].

Munida subrugosa Dana, 1852: 479, pl. 30: fig. 7a–b [type locality: Hermite Island, Tierra del Fuego]. — Filhol, 1885: 425. — Sayce, 1902: 155. — Haig, 1973: 274. — Healy & Yaldwyn, 1970: 68, fig. 33.

Munida subrugosa australiensis Henderson, 1885: 125, pl. 13: figs. 3, 3a–b [type locality: E of Moncoeur Island, Bass Strait]; 1888: 126, pl. 13: figs. 3, 3a–b. — Ortmann, 1892: 254.

Munida australiensis. — Benedict, 1902: 306.

Material examined. NEW SOUTH WALES: AM P5793, 3 males (10.8–13.3 mm), 1 female (12.3 mm), 4.8–6.4 km off Eden, 46–55 m, A. Livingstone & H. Fletcher, May 1922; AM P11892, 2 males (8.3–10.5 mm), 1 female (11.2 mm), off Eden, 37°04'S, 150°10'S, 102 m, CSIRO, 9 Mar 1948; AM P9464, 6 males (10.0–13.9 mm), 4 females

(11.9–12.3 mm), off Montague Island, 36°15'S, 150°14'E, 128 m, State Fisheries, 26 Jun 1929.

TASMANIA: AM E1057, 8 males (9.5–24.0 mm), 47 females (10.5–19.9 mm), E coast of Flinders Island, Bass Strait, 40°01'S, 148°02'E, 53 m, FIS *Endeavour*, 17 May 1909; SAM, 2 males (18.5–19.5 mm), Mercury Passage, 20 m, in scallop collectors, C. Gardner, Mar 1997.

Remarks. The specimens agree well with published accounts (Henderson 1885, 1888, Haig 1973). *Munida gregaria* is readily distinguished from other Australian species of *Munida* in having spines on the anterior margin of the fourth abdominal somite.

Distribution. New Zealand, subantarctic islands, Patagonia, Falkland Islands, off Uruguay, and southern Australia from southern New South Wales, Victoria and Tasmania; 20–1097 m.

Munida haswelli Henderson, 1885

Munida Haswelli Henderson, 1885: 411 [type locality: New South Wales].

Munida haswelli. — Henderson, 1888: 139, pl. 3: fig. 5. — Whitelegge, 1900: 193. — Hale, 1927: 80, fig. 76; 1941: 273. — Haig, 1972: 446; 1973: 273, 275 [part]. — Macpherson, 1994: 474, 477, fig. 21. — Davie, 2002: 64.

Material examined. NEW SOUTH WALES: AM P26833, 5 males (6.2–8.0 mm), 2 females (6.9–10.0 mm), E of Long Reef, 33°46'S, 151°43'E, 176 m, dredge, K77-23-01, 5 Dec 1977; AM P61817, 1 female (17.1 mm), between Green Cape and Cape Howe, 37°22'–33'S, 150°17'–20'E, 329 m, K77-01-01/02/03, 18 Mar 1977; AM P24446, 1 male (10.6 mm), E of Malabar, 33°57'S, 151°19'E, SBS Stn 45; AM P20726, 1 female (11.4 mm), 30 km E of Malabar, 33°58.80'S, 151°34.50'E, 198 m, SBS stn 43, dredge, 9 Aug 1973; AM P1405, 1 ovigerous female (13.2 mm), off Port Jackson; NMV J52156, 1 male (16.2 mm), 37°20.94'S, 150°21.66'E, 370 m, SS01/00/142, epibenthic sled, 16 Apr 2000; AM P65621, 1 female (11.8 mm), E of Bermagui, 36°27'S, 150°19'E, 355–384 m, K75-04-01, 22 Jul 1975; AM P5587, 8 males (6.3–12.1 mm), 8 females (5.7–9.4 mm), 4–6.4 km E of Botany Bay, 34°01'S, 151°19'E, 61–102 m, F. McNeill *et al.*, Aug 1921; NMV J52156, 1 male (16.2 mm), 37°20.94'S, 150°21.66'E, 370 m, SS01/00/142, epibenthic sled, 16 Apr 2000; AM P4686, 1 male (14.0 mm), off Botany Bay, D. Stead, 31 Aug 1919; AM P66654, 1 male (7.2 mm), 1 female (13.4 mm), 3–4.8–6.4 km off Eden, 46–55 m, A. Livingstone & H. Fletcher, May 1922; AM P9340, 2 males (9.2–9.4 mm), 3 ovigerous females (4.5–7.4 mm), off Burrewarra Point, 35°50'S, 150°17'E, 91 m, K. Moller, Jul 1926; AM P20739, 1 male (7.5 mm), 1 female (8.5 mm), E of North Head, 33°49.50'S, 151°21.60'E, 66 m, Australian Museum Shelf Benthic Survey Stn 34, 27 Feb 1973.

VICTORIA: AM P49944, 1 male (21.6 mm), SE of Gabo Island, 37°39'S, 150°16'E, 448 m, K96-21-18, 31 Oct 1996; AM E6114, 2 males (6.2–12.3 mm), 7 females (5.7–13.7 mm), S & SW of Mount Cann, 128–183 m, 27 Aug 1914; AM E6276, 3 males (8.9–13.2

mm), 2 females (9.2–10.3 mm), 64 km SSW of Mount Cann, 128 m, 27 Aug 1914; NMV J52058, 4 males (7.3–9.0 mm), 38°09.8'S, 149°41.71'E, 260 m, SS01/00/1999, epibenthic sled, 22 Apr 2000; NMV J52046, 1 female (13.4 mm), 37°42.71'S, 150°03.00'E, 121 m, SS01/00/143, epibenthic sled, 16 Apr 2000; NMV J52058, 4 males (7.3–9.0 mm), 38°09.80'S, 149°41.71'E, 260 m, SS01/00/1999, epibenthic sled, 22 Apr 2000.

TASMANIA: AM P60193, 1 male (12.3 mm), E of Fortescue Bay, 43°06.70'S, 145°13.60'E, 200 m, TAS-374, J. Lowry *et al.*, 17–18 Apr 1993; AM P60195, 1 male (13.4 mm), E of Fortescue Bay, Tasmania, 43°06.7'S, 145°13.6'E, 200 m, TAS-357, J. Lowry *et al.*, 16 Apr 1993.

SOUTH AUSTRALIA: NMV J52059, 8 males (4.0–7.6 mm), 7 females (6.0–10.0 mm), Great Australian Bight, 33°15.87'S, 130°37.83'E, 139 m, SS01/00/334, Yvonne Bone sled, 9 May 2000; NMV J52043, 2 males (7.2–11.7 mm), 3 females (8.3–11.8 mm), 33°16.00'S, 130°36.59'E, 143 m, SS01/00/350, epibenthic sled, 10 May 2000; SAM C6089, 8 males (8.9–18.5 mm), 1 ovigerous female (11.1 mm), Great Australian Bight, 33°29.77'S, 130°68.30'E, 158 m, SARDI GAB 1515, stn BBMP3, 12 Jun 2002; SAM C6090, 2 males (10.0–11.0 mm), Great Australian Bight, 33°35.70'S, 131°10.90'E, 146 m, SARDI GAB 1462, stn BBMP5c, 12 Jun 2002.

WESTERN AUSTRALIA: AM E3172, 8 males (7.0–21.1 mm), 3 females (9.8–15.4 mm), Great Australian Bight, 96.5–128.7 km W of Eucla, 146–220 m, Mar 1912; AM E3555, 6 males (7.3–20.4 mm), 7 females (6.8–16.4 mm), Great Australian Bight, 96.5–128.7 km W of Eucla, 146–220 m, Mar 1912.

Remarks. The combination of the unarmed anterior margins of the third and fourth abdominal somites and the presence of numerous short striae on all thoracic sternites readily distinguish *Munida haswelli* from other southern Australian congeners. It is most similar to the sympatric *M. chydæa* n. sp. Characters distinguishing *M. haswelli* from *M. chydæa* are outlined under the account of the latter. The specimens of the present series agree well the redescription of type material by Macpherson (1994), including the presence of 7–9 spines on the anterior margin of the second abdominal somite. One female specimen (13.7 mm, AM E6114) has a serpulid tube attached to its carapace.

Distribution. Central New South Wales, south to Victoria, Tasmania, South Australia and the Great Australian Bight, Western Australia; 121–329 m.

Munida isos n. sp. (Fig. 6)

Munida microps. — Haig, 1973: 273 [part, smaller specimen only]. — Davie, 2002: 65 [part]. [Not *M. microps* Alcock, 1894].

Type material. HOLOTYPE: AM P61818, male (19.1 mm), off St. Patricks Head, Tasmania, 41°35'S, 148°14'E, 1100 m, S05/87/15, K. Graham, 12 Jul 1987. PARATYPES: AM P61121, 6 males (16.0–21.3 mm), 14 females (9.1–18.2 mm), off St. Patricks Head, Tas-

mania, 41°35'S, 148°14'E, 1100 m, S05/87/15, K. Graham, 12 Jul 1987; AM P60190, 1 male (6.7 mm), E of Fortescue Bay, 43°08.96'S, 145°15.36'E, 1000 m, TAS-421, J. Lowry *et al.*, 9 Apr 1994; NMV J16062, 1 male (17.2 mm), 39 km NE of Cape Tourville, Tasmania, 41°53.54'S, 148°39.07'E, 732 m, beam trawl, SLOPE 84, G. Poore *et al.*, 30 Oct 1988; NMV J23909, 1 ovigerous female (18.0 mm), NW Tasmania, 41°06–09'S, 143°50'E, 1098–1281 m, G. Suiter, Sep 1986; NMV J39629, 5 males (18.0–20.2 mm), 82.9 km SSE of Southeast Cape, Tasmania, 'Sister 1' seamount, 44°16.2'S, 147°17.4'E, 1100 m, epibenthic sled, T. Stranks, 23 Jan 1997; SAM C6077, 4 males (13.2–20.3 mm), 3 ovigerous females (14.3–15.0 mm; ova 0.6 mm), 85 km SE of South East Cape, 44°14.8'S, 147°27.5'E, 1080–1130 m, FV *Belinda*, K. Gowlett-Holmes, 9 Feb 1992; AM P67170, 1 female (11.1 mm), 51 km SE of Green Cape, 37°30'S, 150°33'E, New South Wales, 860 m, FIS *Endeavour*, 2 Oct 1912.

Other material. AM P20992, 1 ovigerous female (16.0 mm), E of Broken Bay, 33°32–38'S, 152°00–04'E, 824 m, K75-05-05, 19 Aug 1975; NMV J39630, J41591–41618, 2004 specimens, seamounts SSE of South East Cape, Tasmania, 640–1700 m.

Diagnosis. Carapace with long, scattered setae; transverse striae widely spaced, often intervened by short striae or scales; with transverse row of 6 or 7 (usually 6) epigastric spines; with numerous granules on anterolateral region; with 1 or 2 anterior branchial spines; with or without postcervical spine. Frontal margins slightly oblique; rostrum spiniform. Supraocular spines divergent. Margins of carapace with 5 spines posterior to cervical groove. Fourth sternite at most with few short striae; fifth to seventh sternites smooth; ridges demarcating fourth to seventh sternites feebly granular. Second abdominal tergite with row of 6–9 (usually 6) spines on anterior border. Remaining tergites unarmed. Second to third tergites with 1 uninterrupted transverse stria. Fourth tergite with 2 uninterrupted transverse striae. Eye with cornea dilated, maximum diameter about one-quarter distance between anterolateral spines. Basal antennular segment overreaching cornea; with 2 terminal spines, mesial shorter. Basal antennal segment with strong mesial spine; second segment with short mesial and lateral terminal spines, neither overreaching third segment. Maxilliped 3 ischium with distal flexor spine; merus flexor margin with distal and proximal spine. Cheliped slender, 2–3 times carapace length; pollex without ventral spines. Pereopod 2–3 merus with spinose extensor and flexor margins. Pereopod 4 extensor and flexor margins with distal spine. Pereopods 2–4 dactylus with movable spines distributed along entire flexor margin.

Description. *Carapace:* Transverse striae widely spaced, often intervened by short striae or scales; cervical groove distinct; with transverse row of 6 or 7 (usually 6) epigastric spines; with numerous granules on anterolateral region; with 1 or 2 anterior branchial spines; with or without postcervical spine. Dorsum with long, scattered setae. Frontal margins slightly oblique; rostrum spiniform, faintly upcurved, about twice as long as supraocular spines and up to half remaining carapace length. Supraocular spines divergent, deflected dorsally. Anterolateral spine well developed, situated at anterolateral angle,

extending almost to sinus between rostrum and supraocular spine. Margins of carapace anterior to cervical groove with 2 or 3 (usually 2) spines (including anterolateral); with 5 spines posterior to cervical groove.

Sternum: Fourth sternite at most with few short striae; fifth to seventh sternites smooth; ridges demarcating fourth to seventh sternites feebly granular.

Abdomen: Tergites with scattered setae. Second tergite with row of 6–9 (usually 6) spines on anterior border. Remaining tergites unarmed. Second to third tergites with 1 uninterrupted transverse stria. Fourth tergite with 2 uninterrupted transverse striae.

Eye: Cornea dilated, with maximum corneal diameter about one-quarter distance between anterolateral spines.

Antennule: Basal segment overreaching cornea; with 2 terminal spines, mesial shorter; with two lateral spines, distal markedly longer than proximal.

Antenna: Basal segment of peduncle with strong mesial spine. Second segment with short mesial and lateral terminal spines, neither overreaching third segment.

Maxilliped 3: Ischium with distal flexor spine. Flexor margin of merus with distal and proximal spine, proximal largest; extensor margin unarmed.

Pereopod 1 (cheliped): Slender, 2–3 times carapace length; sparsely setose and spinose. Dorsal margin of dactylus with proximal spine and 1 or 2 other small spines along length; occlusal margin denticulate. Propodus upper and outer margin spinose; palm about 4 times as long as high, dorsal margin slightly longer than dactylus; pollex with 2 subterminal spines, occlusal margin denticulate, ventral margin unarmed. Carpus and merus with irregularly distributed spines on lateral, dorsal and mesial surfaces.

Pereopod 2: Merus extensor margin with 9–13 spines; flexor margin with 5 or 6 spines. Carpus with 4 extensor and 1 flexor spine. Propodus flexor margin with 7 or 8 spines. Dactylus with 17 or 18 movable spines distributed along entire flexor margin.

Pereopod 3: Merus extensor margin with 9–11 spines; flexor margin with 3 or 4 spines. Carpus with 5 extensor and 1 flexor spine. Propodus flexor margin with 7 spines. Dactylus with 12–16 movable spines distributed along entire flexor margin.

Pereopod 4: Merus and carpus extensor and flexor margins each with distal spine. Propodus flexor margin with 5–7 spines. Dactylus with 11 or 12 movable spines distributed along entire flexor margin.

Etymology. Named *isos*, Greek, meaning ‘equal’ or ‘like,’ alluding to the similarity of the species to *M. remota*.

Remarks. *Munida isos* n. sp. appears to be closest to *M. remota* Baba, 1990, from Madagascar, in having similar spination and ornamentation of the carapace, walking legs and sternum. The most obvious characters distinguishing *M. isos* from *M. remota* are: the cornea is distinctly dilated instead of being only slightly broader than the stalk; the mesial spine of the basal antennal segment is as long as instead of distinctly shorter than the second antennal segment; and the mesial spine on the second antennal segment is shorter than instead of longer than the third antennal segment.

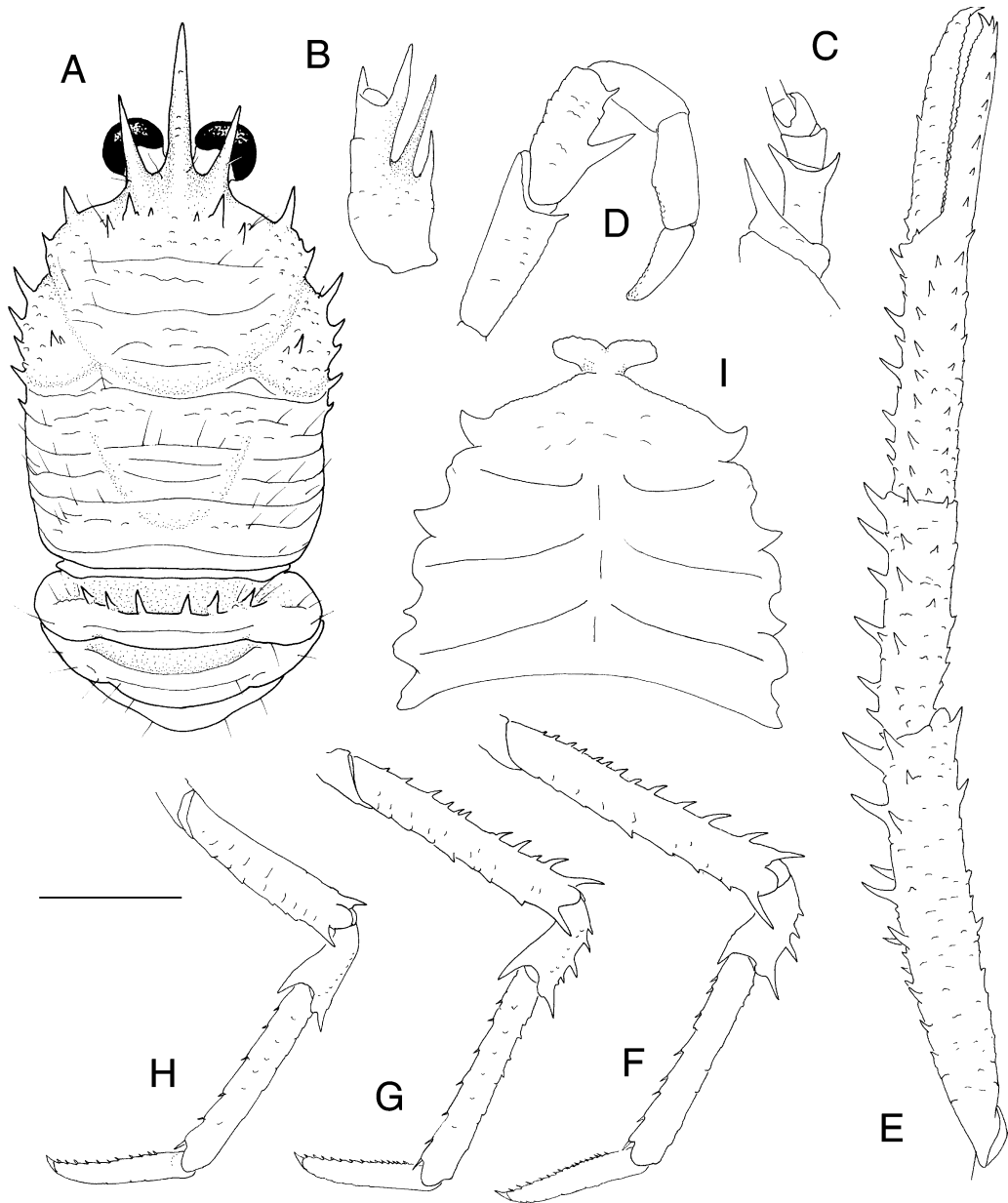


FIGURE 6. *Munida isos* n. sp., holotype male (19.1 mm), AM P61818. A, dorsum. B, left basal antennular segment, ventral. C, left antennal peduncle, ventral. D, right third maxilliped, lateral. E, right cheliped. F–H, right pereopods 2–4, dorsal. I, sternum. Scale A, E–H = 5 mm, B–D, I = 2.5 mm.

Of the regional species, *M. isos* closely resembles *M. endeavourae*, but is readily distinguished by: the cornea is dilated instead of narrow; the inner spine of the second segment of the antennal peduncle does not exceed the third segment; and the carapace bears long scattered setae on the dorsum.

Variation in the present series is slight. Usually two lateral carapace spines are present anterior to the cervical groove, but occasionally a small third spine is present between the usual two. Similarly, additional spines are sometimes present among the usual six spines on the anterior border of the second abdominal tergite, and a postcervical spine is sometimes present on the carapace behind the anterior branchial spines.

Distribution. Known only from east of Broken Bay, New South Wales, south to Tasmania; 640–1700 m. *Munida isos* is abundant on the seamounts off southeastern Tasmania.

***Munida kapala* n. sp. (Fig. 7)**

Type material. HOLOTYPE: AM P31425, male (10.9 mm), NE of Tweed Heads, Queensland, 28°02–05'S, 153°57'E, 364 m, K78-09-03, 1 Jun 1978. PARATYPES: AM P21125, 2 males (4.4–7.4 mm), 2 females (6.2–7.6 mm), SE of Crowdy Head, New South Wales, 38°55–57'S, 153°07–08'E, 403–549 m, among sponges, K75-06-04, 10 Sep 1975; AM P67286, 1 male (9.5 mm), Taupo Seamount, Tasman Sea, 33°16.85'S, 156°09.15'E, 244 m, 1.2 m sled, FR0589-08, J. Lowry *et al.*, 2 May 1989.

Diagnosis. Carapace with transverse row of 8 epigastric spines. Rostrum spiniform, about twice as long as supraocular spines. Margins of carapace anterior to cervical groove with 2 spines (including anterolateral); with 3 spines posterior to cervical groove. Lateral portion of fifth to seventh sternite with short carinae. Second abdominal tergite with row of 8 spines on anterior border; other abdominal tergites unarmed. Eyes with maximum corneal diameter about one-third basal distance between anterolateral spines. Basal segment of antennule with 2 terminal spines, mesial shorter; with two lateral spines. Second segment of antennal peduncle with mesial and lateral terminal spines, mesial not overreaching distal segment of peduncle. Maxilliped 3 merus with distal and larger proximal spine on flexor margin; extensor margin unarmed. Cheliped about twice carapace length; pollex with 1 or 2 proximoventral spines. Pereopods 2–4 dactylus longer than half propodus length, with movable spines along length of flexor margin.

Description. *Carapace:* Transverse ridges mostly uninterrupted; cervical groove distinct; with transverse row of 8 epigastric spines, those behind supraocular spines largest; with paired parahepatic, paired anterior branchial and paired postcervical spines. Frontal margins oblique; rostrum spiniform, faintly sinuous, about twice as long as supraocular spines and about half remaining carapace length. Supraocular spines subparallel. Anterolateral spine well developed, situated at anterolateral angle, not extending to sinus between rostrum and supraocular spine. Margins of carapace anterior to cervical groove with 2 spines (including anterolateral); with 3 spines posterior to cervical groove.

Sternum: Fourth sternites with 2 short striae medially; lateral portion of fifth to seventh sternites with short carinae.

Abdomen: Second tergite with row of 6–8 spines on anterior border. Third to sixth tergites without spines on anterior border. Second and third tergites with 1 uninterrupted

transverse stria respectively. Fourth and fifth tergites smooth, without transverse striae. Sixth tergite with biconcave stria.

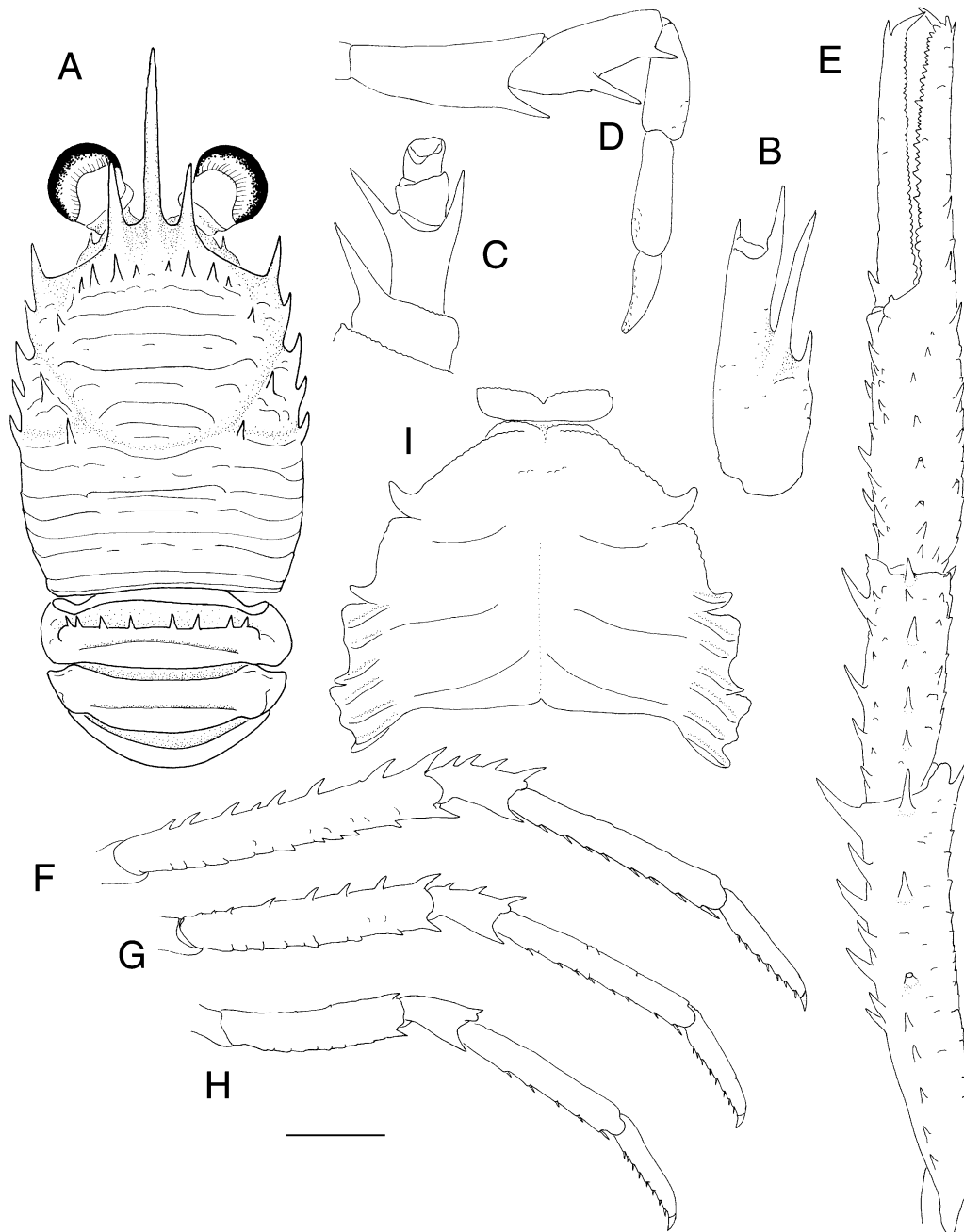


FIGURE 7. *Munida kapala* n. sp., holotype male (10.9 mm), AM P31425. A, dorsum. B, left basal antennular segment, ventral. C, left antennal peduncle, ventral. D, right third maxilliped, lateral. E, right cheliped. F–H, right pereopods 2–4, dorsal. I, sternum. Scale A, E–H = 2 mm, B–D, I = 1 mm.

Eye: Maximum corneal diameter about one-third basal distance between anterolateral spines; peduncle with row of short distal setae ('eyelashes').

Antennule: Basal segment elongate, overreaching cornea; with 2 terminal spines, mesial shorter; with two lateral spines, distal markedly longer than proximal.

Antenna: Basal segment peduncle with strong mesial spine. Second segment with mesial and lateral terminal spines, mesial not overreaching distal segment of peduncle. Third and fourth segments of antennal peduncle unarmed.

Maxilliped 3: Ischium with strong distal flexor spine. Flexor margin of merus with distal and larger proximal spine; extensor margin unarmed.

Pereopod 1 (cheliped): Length about twice carapace length; squamous and sparsely setose. Dactylus dorsally unarmed except for proximal spine and subdistal spine; occlusal margin denticulate. Propodus with palm about 3 times as long as high, shorter than dactylus; dorsal, lateral and ventral margin spinose; pollex with 1 or 2 proximoventral spines and 2 small subterminal spines, occlusal margin denticulate. Dactylus and pollex without gape. Carpus with dorsal, lateral and ventral spine distally; with row of lateral, dorsal and mesial spines and irregularly distributed acute tubercles. Merus with dorsal, lateral, mesial and ventral spine distally; with mesial, lateral and 2 dorsal rows of spines.

Pereopod 2: Merus extensor margin with 8–10 spines; flexor margin with 4–6 spines. Carpus with 4 extensor and 1 flexor spine. Propodus flexor margin with 8 spines. Dactylus about 0.6 propodus length; with 7–9 movable spines along flexor margin.

Pereopod 3: Merus extensor margin with 6 spines; flexor margin with 2 spines. Carpus with 3 extensor and 1 flexor spine. Propodus flexor margin with 8 spines. Dactylus about 0.6 propodus length; with 8 movable spines along flexor margin.

Pereopod 4: Merus and carpus extensor and flexor margins each with distal spine. Propodus flexor margin with 5 spines. Dactylus about 0.7 propodus length; with 6–8 movable spines along flexor margin.

Etymology. Named for the FRV *Kapala*, formerly New South Wales Fisheries, from which most specimens in the present series were collected; noun in apposition.

Remarks. *Munida kapala* n. sp. most closely resembles *Munida rufiantennulata* Baba, 1969 from the western Pacific, and two French Polynesian species, *Munida pulchra* Macpherson & de Saint Laurent, 1991 and *Munida ocellata* Macpherson & de Saint Laurent, 1991. *Munida kapala* differs from each of these species in the following features: the merus of the fourth pereopod lacks a row of dorsal spines; and the outer distal spine of the second antennal segment does not distinctly overreach the third peduncular segment. The new species further differs from *M. rufiantennulata* in bearing short carinae on the lateral portions of the fifth to seventh instead of sixth and seventh thoracic sternites. *Munida kapala* also differs from *M. ocellata* and *M. pulchra* in bearing three instead of four spines behind the cervical groove and the dactyli of the pereopods are longer than instead of shorter than half of the propodus length. As remarked by Macpherson & de Saint Laurent (1991), *M. pulchra* differs morphologically from *M. ocellata* only in having larger eyes

(width one-third instead of one-quarter distance between anterolateral spines). The eyes of *M. kapala* are similar to that of *M. pulchra*.

Distribution. Known from between northeast of Tweed Heads, and the vicinity of Newcastle, New South Wales, at depths of 244–549 m.

Munida militaris Henderson, 1885

Munida militaris Henderson, 1885: 410 (part) [type locality: off Matuku, Fiji]; 1888: 137 (part), pl. 14: figs. 2, 2a–b, 5, 5a–b. — Baba & Macpherson, 1991: 539, fig. 1. — Macpherson, 1994: 496, 499.

Munida vitiensis Henderson, 1885: 410 [type locality: off Matuku, Fiji].

Type material. QUEENSLAND: AM P31538, 2 males (21.0–26.1 mm), 1 female (23.6 mm), NE of Tweed Heads, 28°03'S, 154°04'E, 732 m, K78-23-08, 6 Nov 1978; AM P42261, 1 male (22.6 mm), NE of Tweed Heads, 27°55–57'S, 154°03'E, 549 m, trawl, K78-23-09, 6 Nov 1978.

Remarks. The specimens agree well with the redescription of the type material given by Baba & Macpherson (1991). One specimen (male 26.1 mm, AM P31538) is infected by a bopyrid isopod under the left posterior portion of the carapace.

Distribution. Indonesia, Fiji, New Caledonia and now from southern Queensland, Australia; 183–731 m (Macpherson, 1994, this work).

Munida rogeri Macpherson, 1994

Munida rogeri Macpherson, 1994: 518–521, fig. 44 [type locality: Chesterfield Islands, New Caledonia].

Munida japonica. — Haig, 1972: 447; 1973: 271. — Davie, 2002: 64 [not *M. japonica* Stimpson, 1858].

Type material. WESTERN AUSTRALIA: WAM C4982, 4 males (10.9–13.3 mm), 4 females (10.5–10.7 mm), between Fremantle and Geraldton, 146–220 m, trawled, FIS *Endeavour*, W. B. Alexander, 1912.

Remarks. The present specimens of *M. rogeri* agree with the type description in all respects, and constitute a new record for Australia. Haig (1973) reported these specimens as *M. japonica* Stimpson, 1858.

Distribution. New Caledonia, the Loyalty Islands and now from Western Australia.

Munida rubridigitalis Baba, 1994

Munida rubridigitalis Baba, 1994: 13–16, fig. 6 [type locality: Coral Sea, 17°51.76'S, 147°07.95'E]. — Davie, 2002: 65.

Material examined. QUEENSLAND: AM P42278, 1 male (20.5 mm), 1 female (23.0 mm), NE of Tweed Heads, 27°55–57'S, 154°03'E, 549 m, trawl, K78-23-09, 6 Nov 1978. NEW SOUTH WALES: AM P31504, 2 ovigerous females (18.9–22.6 mm), SE of Cape Byron, 28°41–44'S, 153°51'E, 156 m, K78-17-21, 5 Apr 1978; AM P31423, 1 female (22.5 mm), NE of Sugarloaf Point, 32°15'S, 153°02'E, 457 m, trawl, K78-03-04, 5 Apr 1978; AM P31502, 1 male (19.5 mm), 1 female (18.4 mm), NE of North Solitary Island, 29°53–50'S, 153°42–43'E, 457 m, trawl, K78-06-07, 24 Apr 1978; AM P66658, 2 females (14.9–18.0 mm), NE of Long Reef, 33°42'S, 151°42'E, K85-21-06, 439–466 m, K85-21-06, 19 Dec 1985.

Remarks. *Munida rubridigitalis* is readily distinguished from other known Australian species by the combination of the short chelipeds and the upturned, laterally compressed rostrum.

Distribution. Coral Sea and now from New South Wales at 156–549 m.

Munida spinicruris n. sp. (Fig. 8)

Type material. HOLOTYPE: AM P67297, male (10.0 mm), Gascoyne Seamount, Tasman Sea, 36°43.11'S, 156°13.31'E, 143 m, sled, coral and sand with many large invertebrates, FR0589-4, J. Lowry *et al.*, 1 May 1989. PARATYPES: AM P67298, 5 males (6.8–10.9 mm), 7 females (5 ovigerous) (8.3–13.0 mm), type locality.

Diagnosis. Carapace frontal margins oblique; transverse ridges mostly uninterrupted; with transverse row of 10–12 epigastric spines; with several spinules on lateral anterior quarter of carapace in addition to paired parahepatic, paired anterior branchial and paired postcervical spines. Rostrum spiniform. Supraocular spines subparallel. Margins of carapace with 5 spines posterior to cervical groove. Fourth to fifth sternites at most with 2 or 3 short striae; lateral portion of seventh sternite with coarse granules; ridges demarcating fourth to seventh sternites feebly granular. Second abdominal tergite with row of 6–8 spines on anterior border; third to sixth tergites unarmed; fourth tergite with 2 uninterrupted transverse striae. Eyes large, with maximum corneal diameter about one-third basal distance between anterolateral spines. Basal antennular segment elongate, slightly overreaching cornea; with 2 terminal spines, mesial longer. Basal segment of antennal peduncle with strong mesial spine; second segment with spine on mesial margin and mesial and lateral terminal spines, mesial overreaching distal segment of peduncle. Maxilliped 3 merus with distal and larger proximal spine, and 1 or 2 small intervening spines or acute tubercles on flexor margin; extensor margin with small distal spine. Cheliped about 1.5 times carapace length; pollex with row of ventral spines and small subdistal spine. Propodus of pereopods 2–3 with spines on extensor margin; dactylus with movable spines along entire flexor margin.

Description. *Carapace:* Transverse ridges mostly uninterrupted; cervical groove distinct; with transverse row of 10–12 epigastric spines, those behind supraocular spines larg-

est; with several spinules on lateral anterior quarter of carapace in addition to paired parahepatic, paired anterior branchial and paired postcervical spines. Frontal margins oblique; rostrum spiniform, faintly sinuous, about twice as long as supraocular spines and about half remaining carapace length. Supraocular spines subparallel. Anterolateral spine well developed, situated at anterolateral angle, not extending to sinus between rostrum and supraocular spine. Margins of carapace anterior to cervical groove with 2 or 3 spines (including anterolateral); with 5 spines posterior to cervical groove.

Sternum: Fourth to fifth sternites at most with 2 or 3 short striae; lateral portion of seventh sternite with coarse granules; ridges demarcating fourth to seventh sternites feebly granular.

Abdomen: Second tergite with row of 6–8 spines on anterior border. Third to sixth tergites without spines on anterior border. Second and third tergites with 3 and 2 or 3 uninterrupted transverse striae respectively. Fourth tergite with 2 uninterrupted transverse striae.

Eye: Large, with maximum corneal diameter about one-third basal distance between anterolateral spines.

Antennule: Basal segment elongate, slightly overreaching cornea; with 2 terminal spines, mesial longer; with two lateral spines, distal markedly longer than proximal.

Antenna: Basal segment of peduncle with strong mesial spine. Second segment with spine on mesial margin and mesial and lateral terminal spines, mesial overreaching distal segment of peduncle. Third and fourth segments of antennal peduncle unarmed.

Maxilliped 3: Ischium with strong distal flexor spine. Flexor margin of merus with distal and larger proximal spine, and 1 or 2 small intervening spines or acute tubercles; extensor margin with small distal spine.

Pereopod 1 (cheliped): Length about 1.5 times carapace length; squamous and setose, setae densest dorsally. Dactylus with 6–9 dorsal spines and small subdistal spine; occlusal margin denticulate. Propodus with palm about 2 times as long as high, shorter than dactylus, upper and outer margin irregularly spinose; pollex with row of ventral spines and small subdistal spine, occlusal margin denticulate. Dactylus and pollex with minor gape. Carpus and merus with irregularly distributed spines on lateral, dorsal and mesial surfaces; spines strongest distally.

Pereopod 2: Merus extensor margin with 8–10 spines; flexor margin with 2 spines. Carpus with 4 extensor and 1 flexor spine. Propodus extensor margin with 3 or 4 spines; flexor margin with 9–11 spines. Dactylus about 0.8 propodus length; with 8 or 9 movable spines along entire flexor margin.

Pereopod 3: Merus extensor margin with 5–7 spines; flexor margin with 2 spines. Carpus with 4 extensor and 1 flexor spine. Propodus extensor margin with 3 spines; flexor margin with 8–10 spines. Dactylus about 0.8 propodus length; with 8 or 9 movable spines along entire flexor margin.

Pereopod 4: Merus extensor margin with 2 or 3 small denticles proximally; flexor margin with 2 or 3 spines on distal third. Carpus extensor and flexor margins each with distal spine. Propodus extensor margin with 0–1 spines; flexor margin with 7 or 8 spines. Dactylus about 0.8 propodus length; with 8 or 9 movable spines along entire flexor margin.

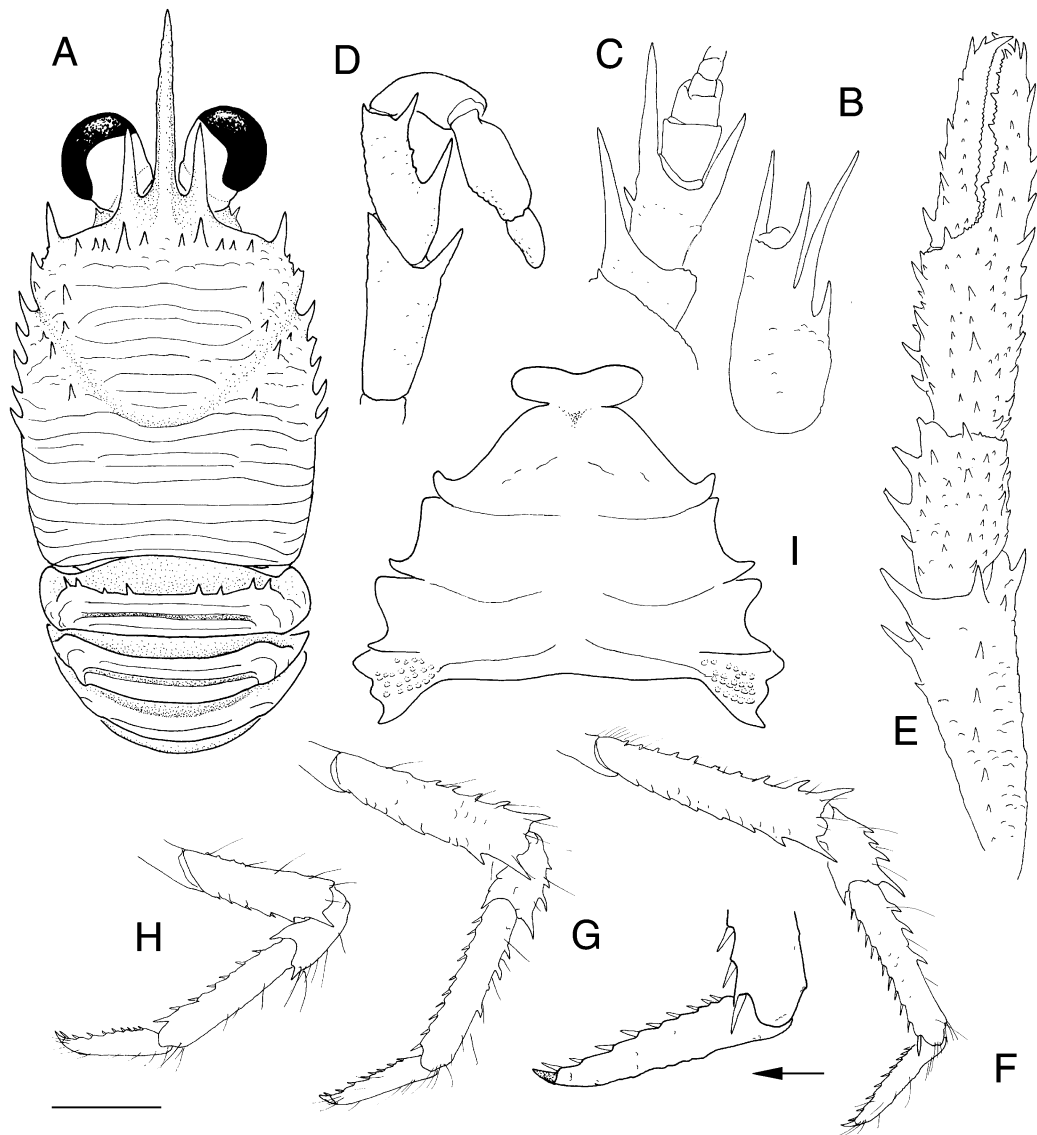


FIGURE 8. *Munida spinicruris* n. sp., holotype male (10.0 mm), AM P67297. A, dorsum. B, left basal antennular segment, ventral. C, left antennal peduncle, ventral. D, right third maxilliped, lateral. E, right cheliped. F–H, right pereopods 2–4, dorsal. I, sternum. Scale A, E–H = 2 mm, B–D, I = 1 mm.

Etymology. Derived from the Latin *spina*, meaning ‘thorn’, and *cruris*, meaning ‘leg’ or ‘limb’, in reference to the characteristic spination of the propodi of pereopods 2–3.

Remarks. *Munida spinicruris* n. sp. closely resembles *M. limula* Macpherson & Baba, 1993 from Madagascar and *M. guttata* Macpherson, 1994 from New Caledonia and the Loyalty Islands. The new species differs from *M. limula* and *M. guttata* in bearing spines on the extensor margin of the propodi of pereopods 2–3 and in bearing striae only on the fourth, instead of the fourth to sixth thoracic sternites. *Munida spinicruris* further differs from *M. guttata* in having a shorter mesial spine on the first antennal segment (not overreaching the peduncle), more spinous chelae and more elongate dactyli of pereopods 2–4, being more than three-quarters instead of about half the propodus length. *Munida spinicruris* further differs from *M. limula* in having a longer mesial spine on the first antennal segment (reaching to midlength instead of base of third antennal segment) and a longer mesial spine on the second antennal segment (distinctly overreaching distal peduncle segment). The smallest female of *M. spinicruris* examined (8.3 mm cl., 5.5 ocl.) is ovigerous suggesting that the species matures at a smaller size than *M. guttata* in which the smallest ovigerous females studied by Macpherson (1994) measured 8.3 mm ocl.

Distribution. Known only from the type locality at 143 m depth.

Munidopsis Whiteaves, 1874

Munidopsis Whiteaves, 1874: 212, 213.

Remarks. More than 150 species of *Munidopsis* are presently known, of which 11 have been reported from Australian waters (Davie 2002, Baba 1994, Baba & Poore 2002). Of the species reported below, four are described as new. *Munidopsis centrina* Alcock & Anderson, 1894, *Ms. dasypus* Alcock, 1894 (under the account of *M. kensleyi* n. sp.), and *Ms. subsquamosa* Henderson, 1885 are newly reported from Australian waters. Note that previous records of *M. dasypus* from Australia (Baba & Poore 2002) are based on *M. kensleyi*. All but three Australian species (*Ms. antonii* Filhol, 1884, *Ms. cidaris* Baba, 1994, *M. dasypus*) are represented in the study area, so the key below includes all known Australian species of *Munidopsis*.

Key to *Munidopsis* known from Australia

- 1 Carapace with prominent median gastric spine..... 2
- Carapace without prominent median gastric spine 4
- 2 Carapace with a single prominent spine on anterior lateral margin
..... *M. valdiviae* (Doflein & Balss, 1913)
- Carapace with 2 prominent spines on anterior lateral margin..... 3

- 3 Carapace covered with spines *M. trachynotus* (Anderson, 1896)
 – Carapace covered with simple or scale-like tubercles
 *M. rostrata* (A. Milne Edwards, 1880)
- 4 Rostrum trifold 5
 – Rostrum not trifold, without lateral spines..... 6
- 5 Carapace with 4 lateral spines (including anterolateral spine).....
 *M. serricornis* (Lovén, 1852)
 – Carapace with 3 lateral spines (including anterolateral spine)..... *M. treis* n. sp.
- 6 Carapace without pair of epigastric spines..... 7
 – Carapace with pair of epigastric spines or projections 12
- 7 Eyestalk and cornea without spines. Cheliped with epipod..... 8
 – Eyestalk and cornea with spines. Cheliped without epipod 10
- 8 Carapace without row of spines on posterior margin. Dactylus of walking legs with
 smooth inner margin..... *M. cidaris* Baba, 1994
 – Carapace with row of spines on posterior margin. Dactylus of walking legs with
 toothed inner margin 9
- 9 Lateral margins of carapace without spines behind anterolateral spine
 *M. kensleyi* n. sp.
 – Lateral margins of carapace with spines behind anterolateral spine
 *M. dasypus* Alcock, 1894
- 10 Rostrum slender, maximum width less than half-length, margins straight. Major eye-
 spine located on anterior margin of cornea 11
 – Rostrum slender, maximum width greater than half-length, with distinct basal con-
 striction. Major eyespine located on mesiodistal margin of eyestalk
 *M. marginata* (Henderson, 1885)
- 11 Body without dense covering of fine setae *M. bispinoculata* Baba, 1988
 – Body with dense covering of fine setae *M. victoriae* Baba & Poore, 2002
- 12 Cheliped (pereopod 1) without epipod..... 13
 – Cheliped (pereopod 1) with epipod..... 14
- 13 Carapace with spines behind epigastric spines. Second and third segments of antennal
 peduncle with mesial and lateral terminal spines.....
 *M. centrina* Alcock & Anderson, 1894
 – Carapace without spines behind epigastric spines. Second and third segments of anten-
 nal peduncle unarmed *M. verrilli* Benedict, 1902
- 14 Epipod on cheliped only..... 15
 – Epipod on pereopods 1–3..... 17
- 15 Carapace dorsum densely covered with fine setae.....
 *M. edwardsii* (Wood-Mason, 1891)
 – Carapace dorsum non-setose, covered with short squamae 16
- 16 Carapace with antennal spine or tooth. Inner margin of dactyli of walking legs with tri-

- angular teeth, each armed with slender movable spine
 *M. subsquamosa* Henderson, 1885
- Carapace without antennal spine. Inner margin of dactyli of walking legs without triangular teeth, relatively even, armed with minute movable spines
 *M. antonii* (Filhol, 1884)
- 17 Cheliped palm about 4 times as long as high. Antennal process of carapace small, pointed *M. proales* n. sp.
- Cheliped palm about 2 times as long as high. Antennal process of carapace blunt, rounded *M. tasmaniae* n. sp.

***Munidopsis centrina* Alcock & Anderson, 1894 (Fig. 9)**

Munidopsis centrina Alcock & Anderson, 1894: 170 [type locality: Bay of Bengal]; 1895, pl. 11: fig. 6.

Munidopsis (Orophorhynchus) centrina. — Alcock, 1901: 251, 270–271.

Material examined. AM P67045, 1 female (14.4 mm), Lord Howe Rise, Tasman Sea, 29°42.06'S, 159°48.31'E, 2450 m, pale grey ooze and pumice, beam trawl, FR0589-17, J. Lowry *et al.*, 3 May 1989.

Diagnosis. Carapace covered with long, coarse setae and short striae; with epigastric and protogastric spines; with dorsal hepatic spine (connected to antennal spine by low carina). Frontal margins oblique, relatively straight; antennal spine directed anteriorly and connected basally with dorsal hepatic spine by low carina. Lateral margins with 5 slender spines behind anterolateral spine. Rostrum spiniform, unarmed laterally, horizontal. Abdominal tergites unarmed. Sixth tergite with posterior margin not strongly produced. Telson composed of 10 plates. Eystalk slightly movable, with medial, lateral and ventral spines, inner longest. Basal segment of antennal peduncle with lateral spine; second segment and third segments with lateral and medial spines. Epipods absent from pereopods. Cheliped short, stout, shorter than carapace; setose; pollex and dactylus distally 'hollowed' on internal margin; pollex with denticulate carina on lower margin; carpus and merus strongly spinose. Walking legs setose and spinose on extensor margin; dactylus with 8 or 9 stout triangular teeth on flexor margin.

Description. *Carapace:* Convex from side to side; covered with long, coarse setae and short striae; cervical groove faintly indicated; with paired epigastric spines, paired smaller lateral protogastric spines, and paired dorsal hepatic spines (connected to antennal spine by low carina). Frontal margins oblique, relatively straight; antennal spine directed anteriorly and connected basally with dorsal hepatic spine by low carina. Lateral margins with 5 slender spines behind anterolateral spine (3 spines in hepatic region and 2 in branchial region). Posterior margin unarmed. Rostrum spiniform, horizontal, unarmed laterally. Pterygostomial flap with striae; anterior margin produced into a small spine.

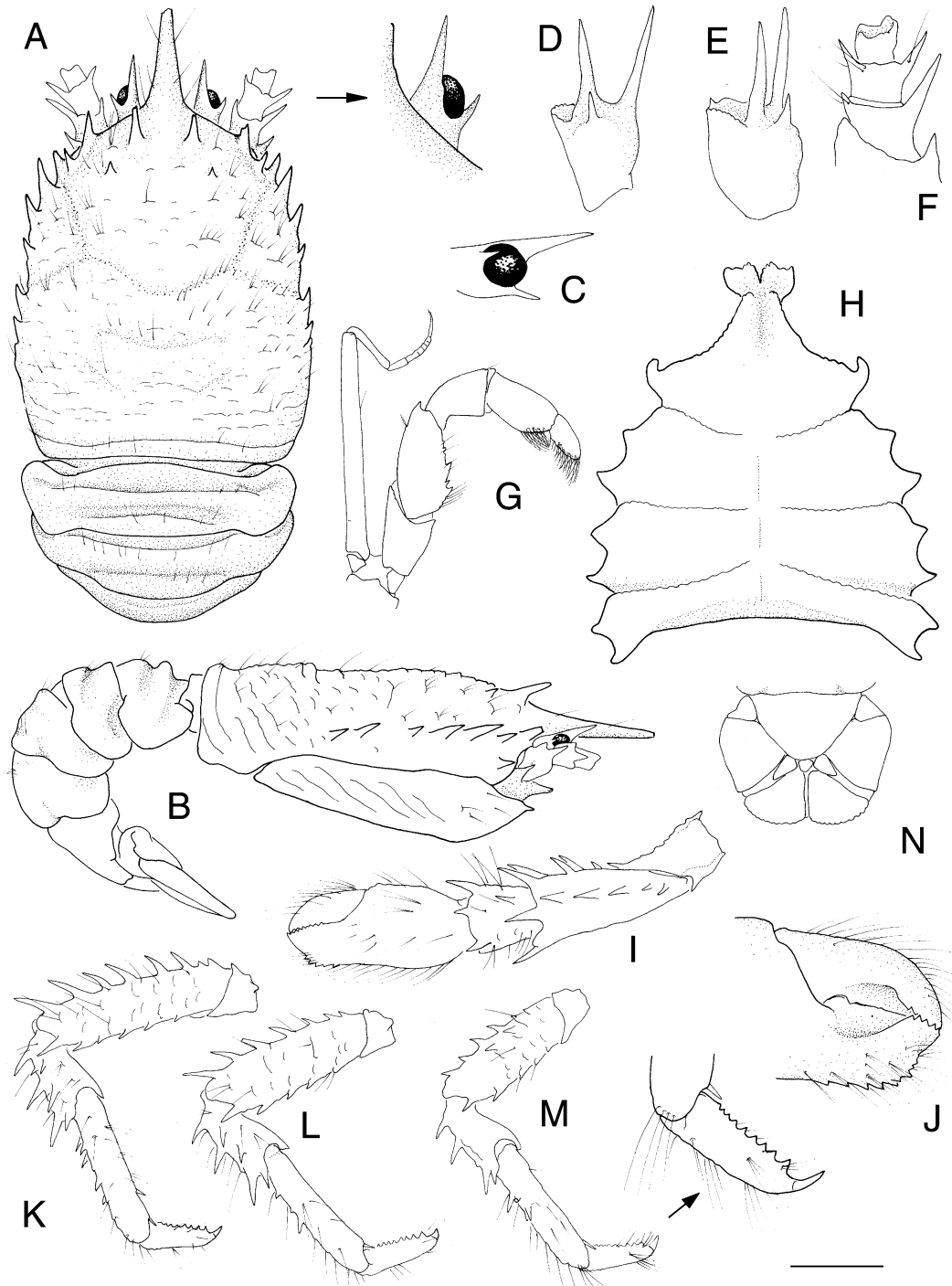


FIGURE 9. *Munidopsis centrina* Alcock & Anderson, 1894, 1 female (14.4 mm), AM P67045. A, dorsum. B, right lateral. C, right eye, lateral. D, left basal antennular segment, lateral. E, left basal antennular segment, ventral. F, left antennal peduncle, ventral. G, right third maxilliped, lateral. H, sternum. I, left cheliped. J, left cheliped, inner distal portion. K–M, left pereopods 2–4, dorsal. N, telson. Scale A, B, I, K–N = 3 mm, C–H, J = 1.5 mm.

Sternum: Third sternite bilobed, separated by notch, about one-third width of sternite 4. Remaining sternites smooth, unarmed; ridges demarcating fourth to seventh sternites feebly granular.

Abdomen: Tergites with short, fine, scattered setae; unarmed. Second and third tergites unarmed; with elevated ridge followed by transverse groove. Sixth tergite with posterior margin not strongly produced. Telson composed of 10 plates. Uropodal endopod with unarmed lateral margins.

Eye: Slightly movable, non-setose; with medial, lateral and ventral spines, inner longest; cornea subglobular, slightly narrower than peduncle; without spine or tooth between eye and antennal peduncle.

Antennule: Basal segment with 3 slender distolateral and shorter distomesial spine.

Antenna: Lateral spine of basal peduncle segment not exceeding second segment; mesial margin produced to a blunt tooth. Second segment and third segments with lateral and medial spines.

Maxilliped 3: Dactylus, propodus and carpus unarmed. Merus with small distal extensor spine; with flexor margin with 3 spines in addition to several acute tubercles.

Epipods: Pereopods 1–4 without epipods.

Pereopod 1 (cheliped): Stout, shorter than carapace; setose. Propodus with palm about 1.5 times as long as high, without spines; dorsal margin of palm slightly longer than dactylus. Pollex and dactylus without gape; occlusal margins denticulate; distally 'hollowed' on internal margin; pollex with denticulate carina on lower margin. Carpus and merus strongly spinose. Ischium with dorsal and ventral spines distally.

Pereopod 2–4: Setose and spinose. Pereopod 2 reaching anteriorly to base of pollex of pereopod 1. Merus squamous, setose; extensor margin with long spines; flexor margin with shorter spines. Carpus extensor margins with long spines. Propodus extensor margin spinose; distal flexor margin with paired movable spines. Dactylus with 8 or 9 stout triangular teeth on flexor margin.

Remarks. The present specimen agrees in most respects with published accounts and figures of *Munidopsis centrina*, known only from the holotype collected in the Bay of Bengal. It differs from Alcock's account and figures of the holotype in lacking spines on the palm of the cheliped, the lateral spine of the basal antennal segment is considerably shorter, being much shorter than instead of distinctly longer than the second segment, the first walking leg does not overreach the cheliped, a transverse row of two instead of four epigastric spines is present on the carapace, and the median group of protogastric carapace spines is absent. Unfortunately, neither Alcock & Anderson (1894) nor Alcock (1901) indicated the number of spines on the basal antennular segment. Although, the Australian specimen perhaps represents a distinct species, the aforementioned differences might also be size-related. The present specimen is about three-quarters of the size of the holotype. The present specimen represents only the second record of the species, so a description and illustrations are provided.

Distribution. The Bay of Bengal and now from eastern Australia; 2450–2719 m.

***Munidopsis kensleyi* n. sp. (Figs. 10, 11A)**

Munidopsis dasypus. — Kensley, 1977: 176, fig. 10. — Baba & Poore, 2002: 233–235, fig. 2 [not *M. dasypus* Alcock, 1894].

Type material. HOLOTYPE: AM P26780, male (22.5 mm), E of Broken Bay, 33°34–31'S, 152°02–04'E, 905–914 m, K77-23-07, 6 Dec 1977. PARATYPES: AM P26781, 1 female (22.0 mm), E of Broken Bay, 33°34–31'S, 152°02–04'E, 905–914 m, K77-23-07, 6 Dec 1977; AM P31544, 1 female (22.1 mm), E of Shoalhaven Bight, 34°54'S, 151°13'E, 810 m, K78-27-05, 12 Dec 1978; AM P26786, 1 female (20.0 mm), E of Broken Bay, 33°34–31'S, 152°02–04'E, 905–914 m, K77-23-07, 6 Dec 1977; AM P64987, 1 male (25.2 mm), E of Tuncurry, 32°05'S, 153°09'E, K88-12-01, 21 Jun 1988; AM P62706, 1 male (24.0 mm), E of Broken Bay, 33°403'S, 152°04'E, 1108–1115 m, K85-21-05, 19 Dec 1985; AM P61816, 4 males (18.7–24.5 mm), 3 females (21.9–23.1 mm), E of Norah Head, 33°26'S, 152°06'E, K80-20-06, 476 m, 9 Dec 1980; AM P67047, 1 male (17.1 mm), off Newcastle, 1150–951 m, NZOI *Tangaroa* stn U223, 10 Oct 1982; AM P67048, 1 ovigerous female (26.0 mm), off Ulladulla, 1060–1109 m, K83-14-02, 25 Oct 1983; NMV J17063, 1 female (24.6 mm), off Nowra, 35°0'S, 151°16.30'E, 1100 m, 5 m otter trawl, SLOPE 9, M. Gomon, 15 Jul 1986.

Comparative specimens of *M. sigsbei* (A. Milne-Edwards, 1880). USNM 150602, 1 male (19.5 mm), 2 females (15.5–20.7 mm), Straits of Florida, 23°51'N, 081°02'W, 1107–1162 m, trawl, 16 Sep 1964; USNM 1001582, 3 males (16.8–20.3 mm), 2 females (18.9–19.7 mm), SW of Panama City, Florida, 28°29'58"N, 086°58'09"W, 783–841 m, NGO-MCS E3A, 13 May 1985; USNM 1001171, 4 males (16.5–22.2 mm), 4 females (10.3–21.0 mm), SW of Grand Island, Louisiana, Gulf of Mexico, 27°19'37"N, 091°31'21"W, 1170–1237 m, 13 Jun 1985.

Comparative specimens of *M. dasypus* Alcock, 1894. AM P67046, 1 female (29.0 mm), Exmouth Plateau, 20°16.5–17.8'S, 113°13.5–12.3'E, 913–914 m, RV *Southern Surveyor*, J. Paxton, 23 Jan 1991; AM P2665, 1 ovigerous female (24.3 mm), off Andaman Islands, 878–911 m, RIMSS *Investigator* (ex Indian Museum no. 134/7).

Diagnosis. Carapace without dorsal spines except for transverse row of 2–5 spines along posterior margin. Frontal margins slightly oblique, with strong anterolateral spine; lateral margins unarmed, subparallel. Rostrum slender; shorter than remaining carapace length; unarmed laterally. Abdominal tergites unarmed; second to fourth tergites with elevated ridge followed by transverse groove. Sixth tergite with posterior margin not strongly produced. Telson composed of 9 plates. Eyestalk unarmed. Cheliped only with epipod. Cheliped elongate; propodus unarmed, margin of palm about as long as dactylus.

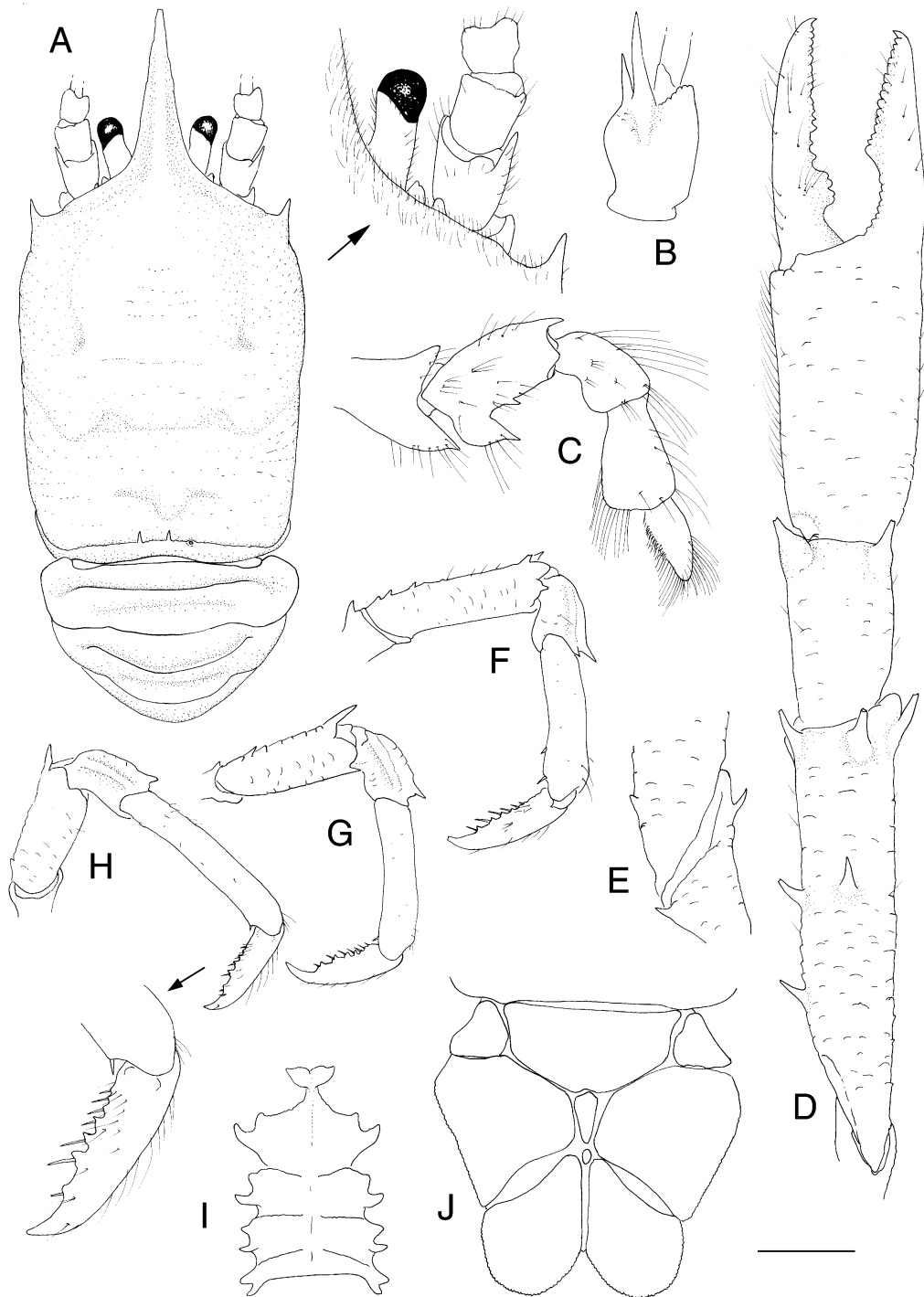


FIGURE 10. *Munidopsis kensleyi* n. sp., holotype male (22.5 mm), AM P26780. A, dorsum. B, right basal antennular segment, ventral. C, right third maxilliped, lateral. D, right cheliped. E, right cheliped, lateral basal portion. F–H, right pereopods 2–4. I, sternum. J, telson. Scale A, D–I = 4 mm, B, C, J = 2 mm.

Description. *Carapace*: Strongly convex; covered with short, fine setae and fine pits; cervical groove distinct; without dorsal spines except for transverse row of 2–5 spines along posterior margin. Frontal margins slightly oblique, with strong anterolateral spine; lateral margins unarmed, subparallel, slightly wider anteriorly; with slight constriction behind anterolateral spine. Rostrum slender, slightly deflected dorsally, apex acute; shorter than remaining carapace length; moderately carinate dorsally; lateral margin slightly irregular but straight. Pterygostomian flap with blunt, angular anterior margin, without anterior spine; lateral surface with shallow striae.

Sternum: Third sternite bilobed, separated by notch, about one-third width of sternite 4; each lobe trianguloid with lateral margin angular. Remaining sternites smooth, unarmed; ridges demarcating fourth to seventh sternites feebly granular.

Abdomen: Tergites with short, fine, scattered setae. Second to fourth tergites unarmed; with elevated ridge followed by transverse groove. Sixth tergite with posterior margin not strongly produced. Telson composed of 9 plates; lateral margin with coarse, relatively stiff setae in males, soft in females. Uropodal endopod with unarmed lateral margins.

Eye: Ocular peduncle unarmed, sparsely setose, basally widened; movable; cornea subglobular, slightly wider than and almost twice as long as peduncle; with small tooth between eye and antennal peduncle.

Antennule: Basal segment with distolateral and shorter distodorsal spine; lateral margin swollen.

Antenna: Basal segment of peduncle unarmed. Second segment with lateral distal spine. Third segment unarmed.

Maxilliped 3: Dactylus, propodus and carpus unarmed. Merus with slender distal extensor spine; flexor margin with large, broad proximal spine and small median spine.

Epipods: Pereopod 1 with epipod. Pereopods 2–4 without epipod.

Pereopod 1 (cheliped): Elongate, 2.0–2.5 times carapace length; setose and rugose; subcylindrical. Propodus unarmed; palm about 2 times as long as high in adult males and 3 times as long as high in females; dorsal margin of palm about as long as dactylus. Pollex and dactylus with gape in adult males; without gape in females; distally ‘hollowed’ on internal margin. Carpus with dorsal and ventral spines distally. Merus with distal spines and 2 rows of 1–3 spines on lateral and dorsal surfaces.

Pereopod 2–4: Setose; subcylindrical. Merus extensor margin with 1–4 spines and strong distal spines. Carpus flexor margin with 1 or 2 distal spines and low lateral carina. Propodus with 2 or 3 movable spines on distal flexor margin, distal most paired; unarmed dorsally. Dactylus flexor margin with 5–7 stout teeth, each bearing slender movable spines.

Colour in life. Pinkish-orange.

Etymology. Named in honour of the late Brian Kensley, National Museum of Natural History, Smithsonian Institution, who first reported the species under the name *Munidopsis dasyopus*.

Remarks. *Munidopsis kensleyi* n. sp. resembles *Ms. sigsbei* from the Western Atlantic in almost all respects. Differences between the two species are subtle and most obvious when specimens are directly compared: the relative breadths of the carapace, rostrum and antennal peduncle of *Ms. kensleyi* are slightly greater than in *Ms. sigsbei* (Figs. 10A, 11D). Similarly, the chelae in *Ms. kensleyi* are distinctly more robust than in size- and sex-matched *Ms. sigsbei* (Figs. 10D, 11A–C). In addition, the outer margin of the basal antennular segment is less swollen and the dactylar teeth of the walking legs are relatively shorter in *Ms. kensleyi* than in *Ms. sigsbei* (Figs. 10B, H, 11E, F). The best character distinguishing *Ms. kensleyi* from *Ms. sigsbei*, however, is the relative length of the dactylus of the chela, being about equal to instead of distinctly longer than the dorsal length of the palm (Figs. 10D, 11A–C). In general, the chelae and the meri of the walking legs of *Ms. kensleyi* are also less spinose than in *Ms. sigsbei*. In both *Ms. kensleyi* and *Ms. sigsbei*, the lateral telson setae are soft in females but coarse and stiff in males.

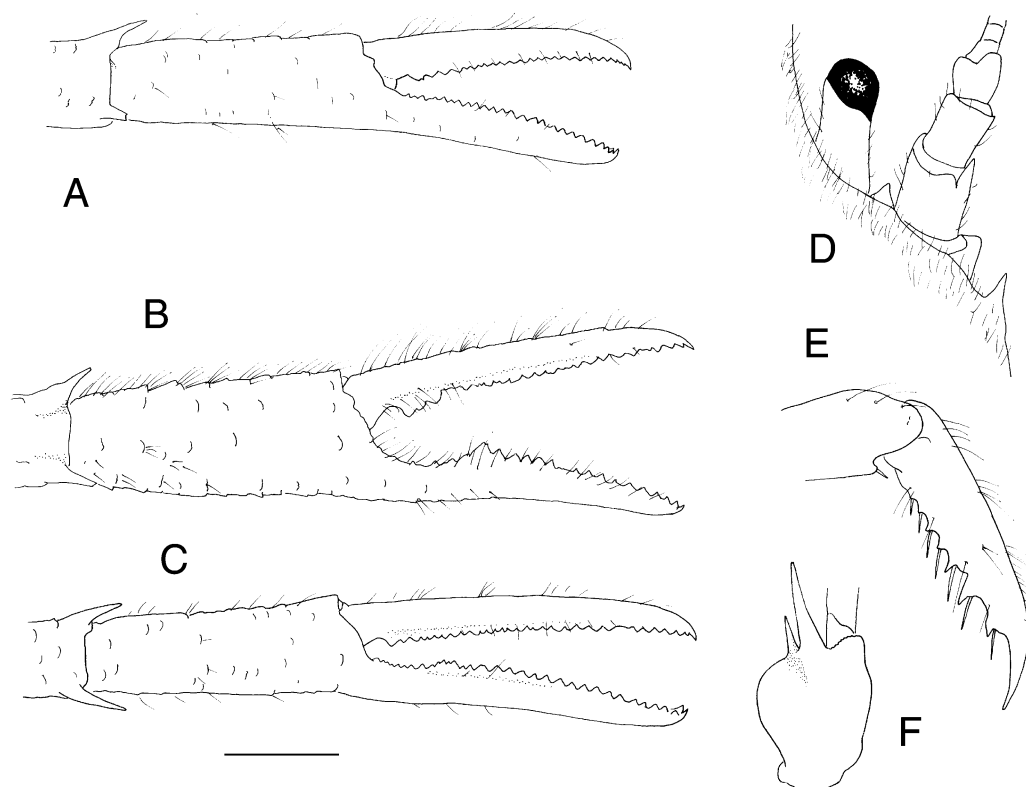


FIGURE 11. A, *Munidopsis kensleyi* n. sp., female paratype (22.0 mm), AM P26781, right chela. B–F, *Munidopsis sigsbei* (A. Milne-Edwards, 1880). B, D–F, male (20.8 mm), USNM 1001171. C, female (20.7 mm) USNM 150602. A–C, right chela. D, right anterior cephalothorax. E, right pereopod 2, dactylus. F, right basal antennular segment, ventral. Scale A–C = 4 mm, D–F = 2 mm.

Munidopsis kensleyi was misidentified with the Indo-West Pacific *Ms. dasypus* Alcock, 1894 by Baba & Poore (2002) and Kensley (1977). Baba & Poore's (2002) specimen (NMV F17063) is herein designated as a paratype of *Ms. kensleyi*. Kensley (1977) noted the differences in lateral carapace spination between his southern African specimen and typical specimens of *Ms. dasypus* but accounted for these anomalies by citing MacGilchrist (1905) who apparently reported similar variation in carapace spination for *Investigator* specimens. The variation in carapace spination of *Ms. dasypus* reported by MacGilchrist (1905), however, referred to the posterior rather than lateral margin of the carapace. The lateral carapace spines behind the anterolateral spine in *Ms. dasypus* are diagnostic (Alcock 1894, 1901, Australian Museum specimens examined herein) and will readily distinguish *Ms. dasypus* from *Ms. kensleyi*. *Munidopsis dasypus* further differs from *Ms. kensleyi* in having longer, more upright spines on the chelae and pereopods.

The Western Australian specimen of *Ms. dasypus* constitutes the first reliable record of the species from Australia and agrees well with the Andaman Sea specimen collected by the *Investigator*.

Distribution. Southern Africa and southeastern Australia; 476–1115 m.

Munidopsis proales n. sp. (Fig. 12)

Type material. HOLOTYPE: SAM C6087, female (ocl. 9.1 mm), 148 km ESE of Cape Arid, Western Australia, 34°13'S, 124°37.9'E, 513–540 m, trawl, FV *Adelaide Pearl* stn 9, K. Gowlett-Holmes *et al.*, 30 Jul 1988.

Diagnosis. Carapace covered with strongly rugose, upraised squamae and tubercles; cervical groove distinct; regions well defined; with pair of blunt epigastric processes; frontal margin with narrow, blunt antennal process; lateral margins with four large, pointed, anterolaterally directed teeth; posterior margin unarmed. Abdominal tergites unarmed. Sixth abdominal tergite with posterior margin not strongly produced. Telson composed of 8 plates. Eyestalk movable, with short, multipapillate dorsal processes. Pereopods 1–3 (cheliped and first two walking legs) with epipod. Cheliped slender; sparsely setose and rugose; palm about 4 times as long as high. Walking legs coarsely tuberculate; dactylus with 15–17 small movable spines on flexor margin.

Description. *Carapace:* Moderately arched from side to side; covered with sparsely setose, strongly rugose, upraised squamae and tubercles; cervical groove distinct; regions well defined; with pair of blunt epigastric processes. Frontal margin with narrow, blunt antennal process. Lateral margins with four large, pointed, anterolaterally directed teeth; carapace widest at posteriormost tooth. Posterior margin with low ridge, covered with rugose squamae. Rostrum unknown. Pterygostomian flap with squamous surface; anterior margin angular, blunt, acute but not spinous.

Sternum: Third sternite about one-third with of sternite 4; anterior margin with shallow concavity. Anterior two-thirds of sternite 4 covered with short, finely setose striae.

Remaining sternites with scattered striae. Ridges demarcating fourth to seventh sternites feebly granular.

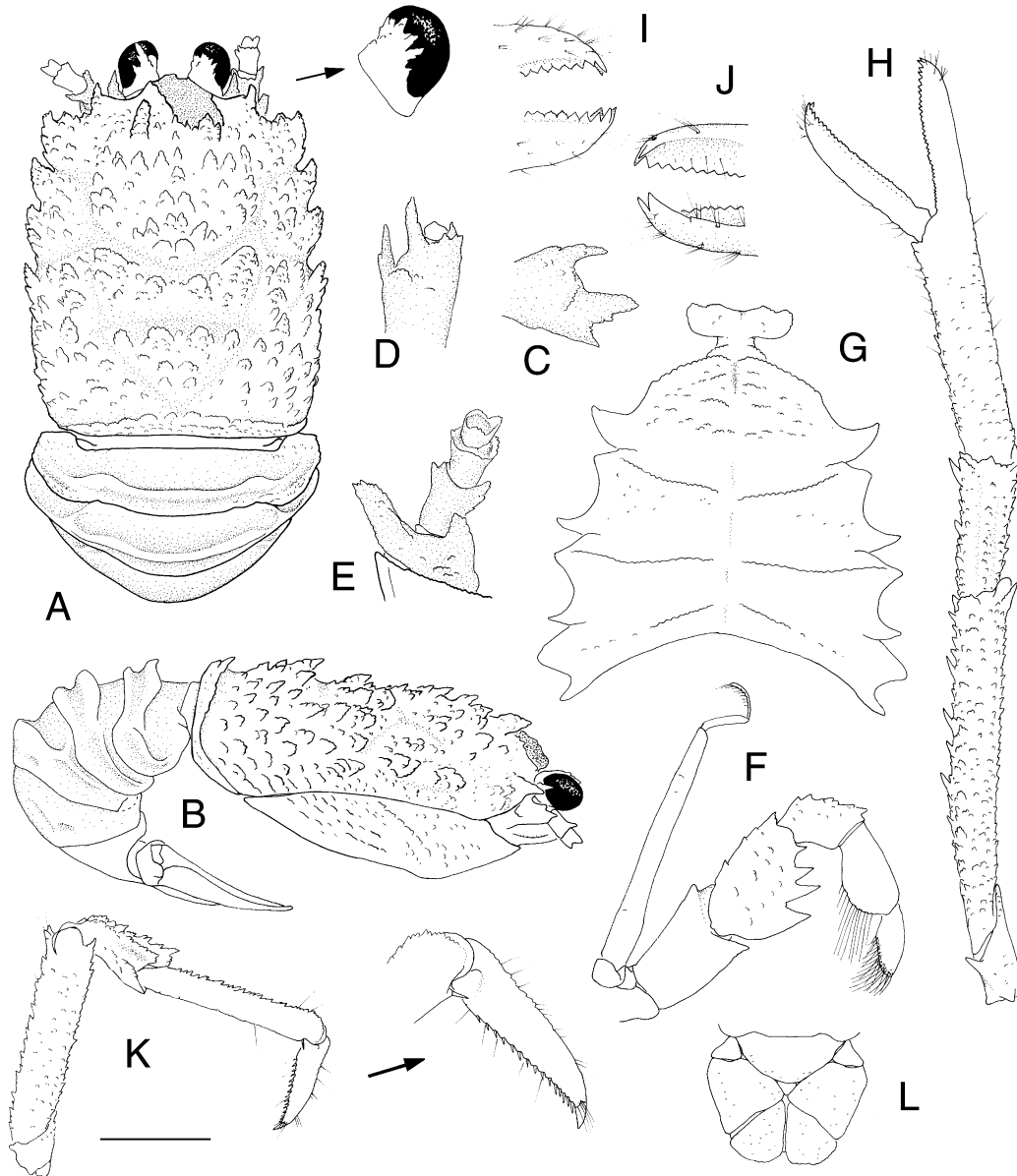


FIGURE 12. *Munidopsis proales* n. sp., holotype female (ocl. 9.1 mm) SAM C6087. A, dorsum. B, right lateral. C, right basal antennular segment, lateral. D, right basal antennular segment, ventral. E, left antennal peduncle, ventral. F, right third maxilliped, lateral. G, sternum. H, right cheliped. I, right cheliped, outer distal. J, right cheliped, inner distal. K, pereopod 2, right dorsal. L, telson. Scale A, B, H, K, L = 3 mm, C–G, I, J = 1.4 mm.

Abdomen: Tergites with short, fine, scattered setae. Second to fourth tergites unarmed; with elevated ridge followed by transverse groove. Sixth tergite with posterior margin not strongly produced. Telson composed of 8 plates. Uropodal endopod with unarmed lateral margins.

Eye: Movable, with short, multipapillate processes dorsally; cornea subglobular, slightly wider than peduncle, non-setose; with elongate tooth between eye and antennal peduncle.

Antennule: Basal segment with distolateral spine, shorter distodorsal spine and small distoventral spine.

Antenna: Basal segment of peduncle with blunt distolateral and distomedial processes. Second segment with blunt distolateral and distomedial tooth. Remaining segment unarmed.

Maxilliped 3: Dactylus and propodus unarmed. Carpus with 3–4 small teeth or acute tubercles. Merus extensor margin with distal tooth and several smaller teeth; flexor margin with 4 teeth, proximal largest.

Epipods: Pereopods 1–3 with epipod. Pereopod 4 without epipod.

Pereopod 1 (cheliped): Slender; sparsely setose and rugose. Propodus squamose and coarsely tuberculate dorsally; palm about 4 times as long as high; dorsal margin of palm longer than dactylus. Pollex and dactylus without gape; occlusal margins crenulate; distally ‘hollowed’ on internal margin. Carpus and merus with dorsal and ventral spines distally; surfaces squamous and coarsely tuberculate; dorsal margins spinous. Ischium with dorsal distal spine; surface tuberculate. *Pereopod 2–4:* Sparsely setose; slightly decreasing in length posteriorly. Merus coarsely tuberculate; extensor and flexor margins with flattened distal tooth; subtriangular in cross-section. Carpus with 3 coarsely tuberculate carinae, with distal extensor spine. Propodus coarsely tuberculate; distal flexor margin with paired movable spines; quadrate in cross-section. Dactylus with 15–17 small movable spines on flexor margin.

Etymology. Named *proales* (Greek), meaning overhanging, alluding to the upright, overhanging squamae that ornament the dorsum of the species.

Remarks. Unfortunately, the rostrum in the single specimen of *Munidopsis proales* n. sp. is missing. All other features, however, are intact allowing its recognition as a new species. *Munidopsis proales* most closely resembles *Ms. tasmaniae*, sharing similar carapace shape and ornamentation, and epipods on the pereopods 1–3; distinguishing features are outlined under the account of the latter.

Distribution. Known only from the type locality, off Cape Arid, Western Australia; 513–540 m.

***Munidopsis rostrata* (A. Milne-Edwards, 1880)**

Galacantha rostrata A. Milne-Edwards, 1880: 52 [type locality: Bequia, Windward Islands].

Munidopsis rostrata. — Chace, 1942: 75. — Baba, 1988: 161; 1994: 18. — Davie, 2002: 65. — Baba & Poore, 2002: 236–241, fig. 5.

Material examined. NEW SOUTH WALES: AM P64921, 1 male (28.1 mm), 1 ovigerous female (24.2 mm), off Newcastle, 32°59.7'S, 153°01.4'E, 2984–3058 m, NZOI *Tangaroo*, U214, 8 Oct 1982.

Remarks. *Munidopsis rostrata* was reported from Queensland by Baba (1994), and from New South Wales and Victoria by Baba & Poore (2002). The present specimens agree well with the account and figure given by Baba & Poore (2002).

Distribution. Indo-Pacific, Atlantic and Southern Oceans. The Indo-Pacific range includes Zanzibar, the Arabian Sea, Indonesia, Japan and Australia; 1584–3294 m (Baba 1988, Baba & Poore 2002; this study).

Munidopsis serricornis (Lovén, 1852)

Galathea serricornis Lovén, 1852, 1852: 22 [type locality: Sweden].

Galathea tridentata Esmark, 1857: 239 [type locality: Lofoten, W coast of Norway].

Galathodes rosaceus A. Milne-Edwards, 1881: 43 [type locality: NW coast of Spain].

Munidopsis tridentata. — Chace, 1942: 88–89. — Baba, 1988: 172–173, fig. 70.

Munidopsis serricornis. — Baba & Poore, 2002: 241–244, figs. 6–9.

Material examined. TASMANIA: AM P61819, 2 males (13.6–20.6 mm), 2 females (13.6–22.2 mm), off St. Patricks Head, Tasmania, 41°35'S, 148°14'E, 1100 m, trawl, FRV *Soela*, S05/87/15, K. Graham, 12 Jul 1987.

Remarks. *Munidopsis serricornis* was recently reported and figured from Australia by Baba & Poore (2002) and was regarded as a variable, cosmopolitan species. One specimen contributing to this conclusion, identified by Baba & Poore (2002) as *Ms. serricornis*, is referable to *Ms. treis* n. sp. described below. The remaining Australian specimens of *Ms. serricornis* studied by Baba & Poore (2002) together with the present series differ from Atlantic specimens in bearing a pair of epigastric spines on the carapace, but agree in bearing spinose meri of the walking legs. Philippine specimens of *Ms. serricornis* reported by Baba (1988) (as *Ms. tridentata*) and two *Investigator* specimens from the Bay of Bengal (AM P2701) agree with Atlantic specimens in lacking epigastric spines, but differ from Atlantic specimens in having smaller lateral carapace spines less spinose meri of the walking legs. Although Baba (1988) and Baba & Poore (2002) characterised *Ms. serricornis* as a variable and cosmopolitan species, it appears that specimens from different localities are readily diagnosed. Further study may well indicate that several species are involved.

Distribution. Known from both sides of the Atlantic and the Indo-Pacific from the western Indian Ocean to Indonesia, the Philippines, and southeastern Australia (Baba & Poore 2002).

Munidopsis subsquamosa Henderson, 1885 (Fig. 13)

Munidopsis subsquamosa Henderson, 1885: 414 [type locality: SE of Nojima-zaki, Chiba, Japan]; 1888: 152–153, pl. 17: fig. 4. — Gordon, 1955: 244, figs. 1B, 2C, 3D. — Baba, 1982: 114–115, fig. 5, pl. 2: fig. 2.

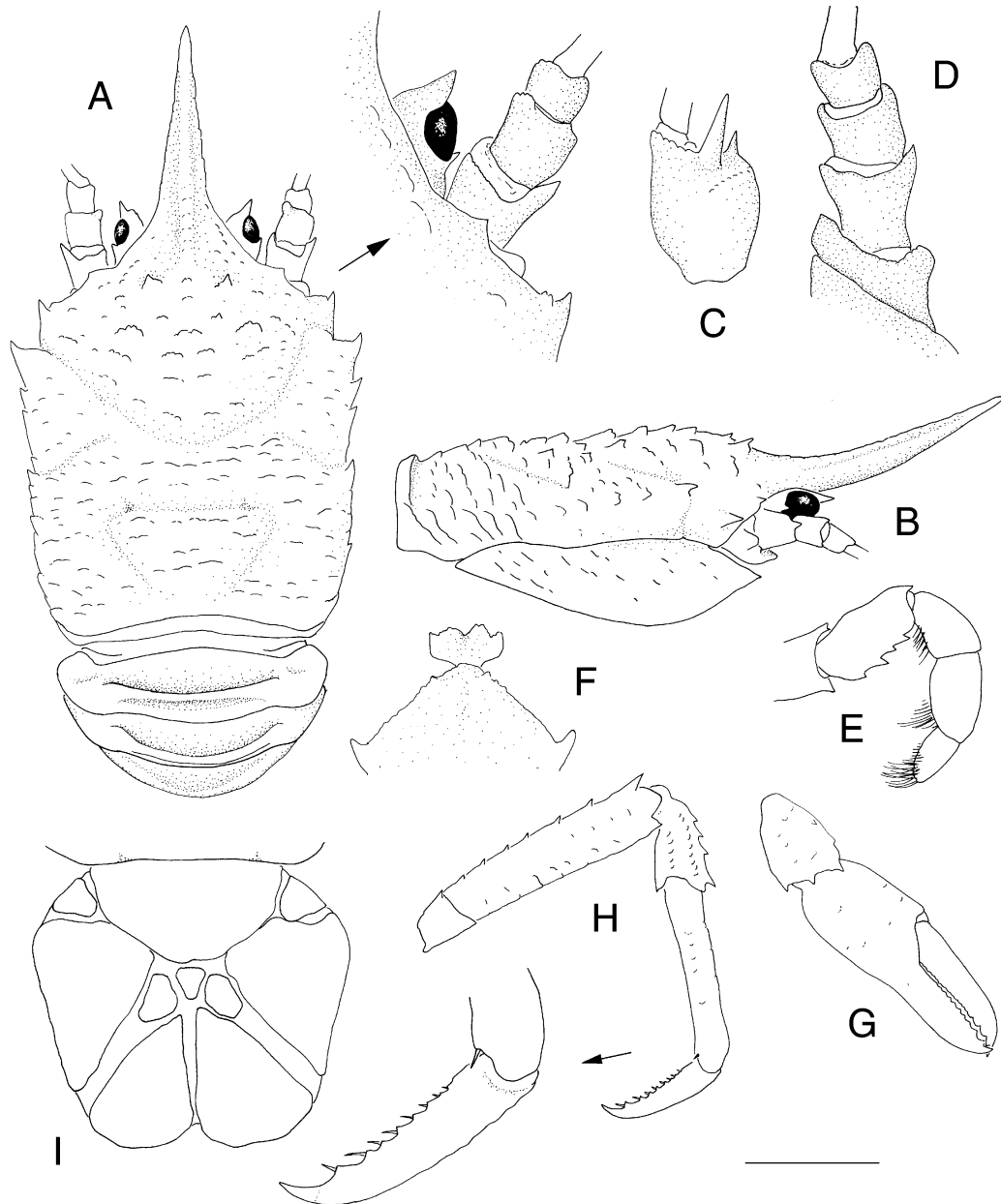


FIGURE 13. *Munidopsis subsquamosa* Henderson, 1885, juvenile male (9.1 mm), AM P67049. A, dorsum. B, right lateral. C, left basal antennular segment, ventral. D, left antennal peduncle, ventral. E, right third maxilliped, lateral. F, sternum, anterior portion. G, right chela. H, pereopod 2, right dorsal. I, telson. Scale A, B, G, H = 2 mm, C–F, I = 1 mm.

Material examined. QUEENSLAND: AM P67839, 1 male (26.1 mm), 2 females (25.1–34.1 mm), E of Cape York, 11°35.81'S, 145°29.13'E, 1789–1876 m, beam trawl, FR0688-13, P. Hutchings *et al.*, 22 Aug 1988. NEW SOUTH WALES: AM P67049, 1 juvenile male (9.1 mm), E of Newcastle, 32°59.7'S, 153°01.4'E, 2984–3058 m, NZOI *Tangaroa*, U214, 8 Oct 1982.

Remarks. The three adult specimens from north Queensland, included herein to document their presence there, agree well with published accounts (Henderson 1888, Gordon 1955, Baba 1982). The juvenile specimen from New South Wales (9.1 mm) differs from adults in size related features: the rostrum is relatively longer, and the degree of overall squamation and spination is markedly less pronounced.

Distribution. Japan, both sides of the Pacific, the Gulf of Panama (Baba 1982) and now from eastern Australia; 1789–3430 m.

Munidopsis tasmaniae n. sp. (Fig. 14)

Type material. HOLOTYPE: AM P67287, male (15.2 mm), off St. Patricks Head, Tasmania, 41°35'S, 148°14'E, 1100 m, S05/87/15, K. Graham, 12 Jul 1987. PARATYPES: AM P67288, 1 ovigerous female (17.7 mm), type locality; SAM C6056, 1 ovigerous female (15.8 mm), 91 km NW of Currie Harbour, 39°43.09'S, 143°00.57'E, 1135 m, 5 Mar 1989.

Diagnosis. Carapace covered with sparsely setose squamae and tubercles; cervical groove distinct; regions well defined; with pair of broad, blunt, flattened epigastric processes; frontal margin with large, blunt antennal process; lateral margins with four large, blunt anterolaterally directed teeth; posterior margin unarmed. Rostrum trianguloid, slightly longer than one-third remaining carapace length; broad basally, margins convex and serrate; apex blunt; dorsally carinate and sparsely tuberculate. Abdominal tergites unarmed. Sixth tergite with posterior margin not strongly produced. Telson composed of 8 plates. Eyestalk movable, with short, papillate, tubercular process mediodorsally. Pereopods 1–3 (cheliped and first two walking legs) with epipod. Cheliped elongate, twice carapace length; setose and rugose; palm about 2 times as long as high. Walking legs coarsely tuberculate; carpus extensor margin spinose; dactylus with 11–14 small movable spines on flexor margin.

Description. *Carapace:* Moderately convex from side to side; covered with sparsely setose squamae and tubercles; cervical groove distinct; regions well defined; with pair of broad, blunt, flattened epigastric processes. Frontal margin with large, blunt antennal process. Lateral margins with four large, blunt anterolaterally directed teeth; carapace widest at posteriormost tooth. Posterior margin with low ridge, squamous, unarmed. Rostrum subtriangular, slightly longer than one-third remaining carapace length; broad basally, margins convex and serrate; apex blunt; dorsally carinate and sparsely tuberculate. Pterygostomian flap with squamous surface; anterior margin angular, blunt, acute but not spinous.

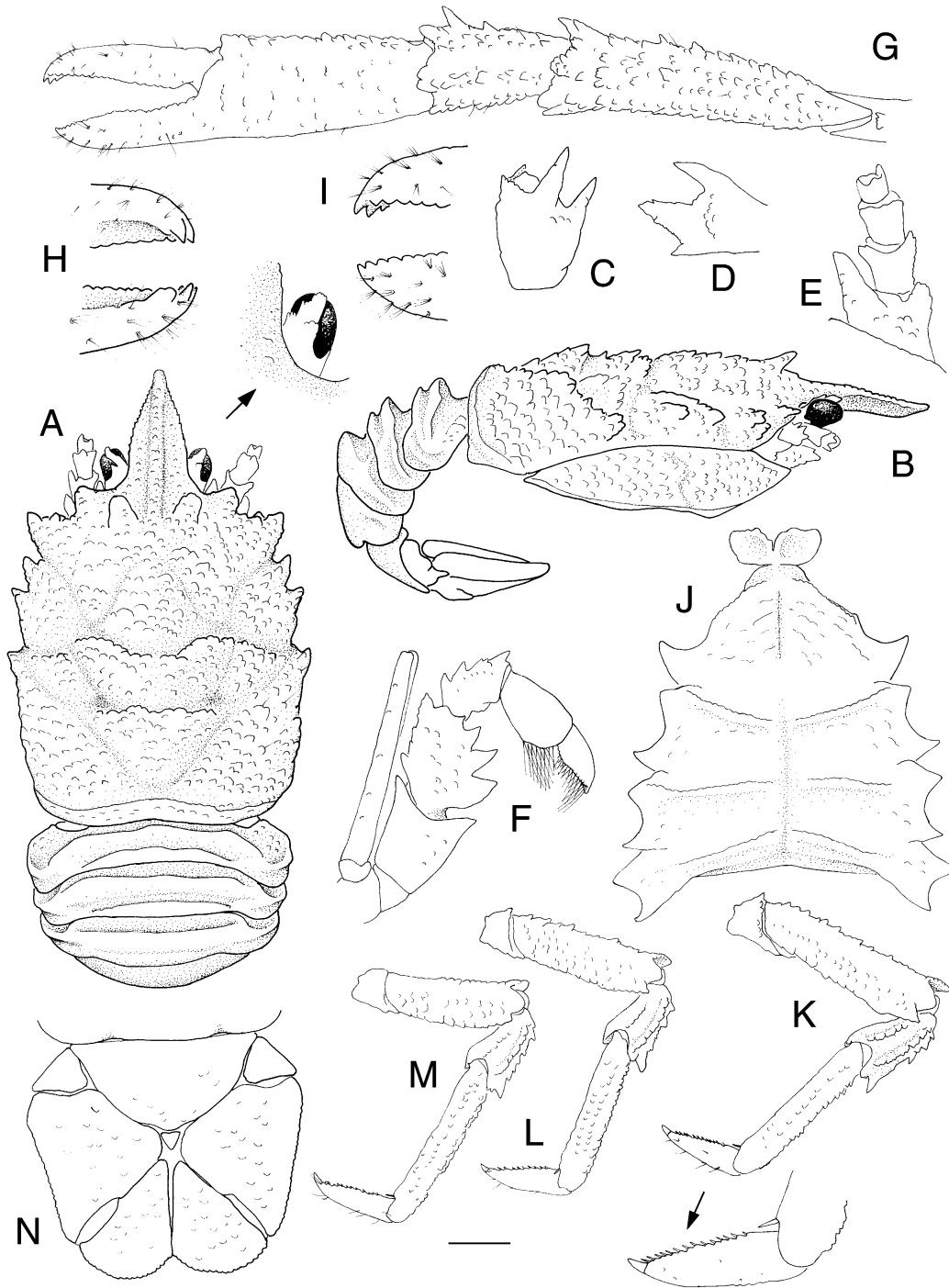


FIGURE 14. *Munidopsis tasmaniae* n. sp., holotype male (15.2 mm), AM P67287. A, dorsum. B, right lateral. C, left basal antennular segment, ventral. D, left basal antennular segment, lateral. E, left antennal peduncle, ventral. F, right third maxilliped, lateral. G, left cheliped. H, left cheliped. inner distal. I, right cheliped, outer distal. J, sternum. K–M, pereopods 2–4, right dorsal. N, telson. Scale A, B, G, K–M = 2 mm, C–F, H–J, N = 1 mm.

Sternum: Third sternite bilobed, separated by notch, about one-third with of sternite 4. Anterior two-thirds of sternite 4 covered with short, finely setose striae. Sternite 5 with several short, finely setose striae anteriorly and laterally. Remaining sternites with several striae laterally. Ridges demarcating fourth to seventh sternites feebly granular.

Abdomen: Tergites with short, fine, scattered setae. Second to fourth tergites unarmed; with elevated ridge followed by transverse groove. Sixth tergite with posterior margin not strongly produced. Telson composed of 8 plates. Uropodal exopod with unarmed outer margins.

Eye: Movable, with short, papillate, tubercular process mediodorsally, non-setose; cornea subglobular, as wide as peduncle; with small blunt tooth between eye and antennal peduncle.

Antennule: Basal segment with distolateral spine, shorter distodorsal spine and small distoventral spine.

Antenna: Basal segment of peduncle with blunt distolateral and distomedial processes. Second segment with blunt distolateral and distomedial tooth. Remaining segment unarmed.

Maxilliped 3: Dactylus and propodus unarmed. Carpus extensor margin with 2 or 3 teeth. Merus extensor margin with 2 teeth intervened by several acute tubercles; flexor margin with 4 teeth, proximal largest.

Epipods: Pereopods 1–3 with epipod. Pereopod 4 without epipod.

Pereopod 1 (cheliped): Elongate, twice carapace length; setose and rugose. Propodus squamose and coarsely tuberculate dorsally; palm about twice as long as high; dorsal margin of palm longer than dactylus. Pollex and dactylus without gape; occlusal margins crenulate; distally 'hollowed' on internal margin. Carpus and merus with dorsal and ventral spines distally; surfaces squamous and coarsely tuberculate. Ischium with dorsal distal spine; surface tuberculate.

Pereopod 2–4: Sparsely setose, slightly decreasing in length posteriorly. Merus coarsely tuberculate; extensor and flexor margins with flattened distal tooth; trianguloid in cross-section. Carpus with 3 coarsely tuberculate carinae, with distal extensor spine. Propodus coarsely tuberculate; distal flexor margin with paired movable spines; ovate in cross-section. Dactylus with 11–14 small movable spines on flexor margin.

Etymology. Named for the state of Tasmania; a noun in the genitive singular.

Remarks. *Munidopsis tasmaniae* n. sp. most closely resembles *Ms. proales* n. sp. in bearing epipods on the first three pereopods and in the general carapace ornamentation in which the lateral and frontal teeth are broad and blunt, the dorsum is covered with squamae, and the paired epigastric processes are flattened and apically blunt. *Munidopsis tasmaniae* is readily distinguished from *Ms. proales* in having smaller and much lower squamae on the carapace, and in having more robust chelae. Unfortunately, the rostrum of *Ms. proales* is unknown.

The carapace ornamentation of both new species resembles *Ms. sonne* Baba, 1995 in the covering of squamae, blunt lateral and frontal teeth and serrate rostral margins (unknown in *Ms. proales*). The two new species are readily distinguished from *Ms. sonne* by the well- instead of ill-defined lateral carapace teeth, distinct but blunt epigastric processes, presence of small blunt processes on the eyestalks, and the uni- instead of multispi-nose dorsal margin of the basal antennular segment.

Distribution. Known only from southeastern Tasmania at 1100–1135 m depth.

***Munidopsis treis* n. sp. (Fig. 15)**

Munidopsis serricornis. — Baba & Poore, 2002: 241–244, fig. 6C, 7B, 8B, 9C, D [part, not *M. serricornis* (Lovén, 1852)].

Type material. HOLOTYPE: SAM C6091, ovigerous female (16.4 mm), 278 km W of Cape Catastrophe, Great Australian Bight, South Australia, 34°58'S, 132°32'E, 800 m, B. Jubb, 20 Aug 1988. PARATYPES: SAM C6092, 1 male (10.2 mm), 3 females (12.9–14.9 mm), type locality; NMV J44745, 1 female (9.4 mm), 82.1 km SSE of Southeast Cape, Tasmania, 'Sister 1' seamount, 44°16.8'S, 147°15.6'E, 820 m, epibenthic sled, T. Stranks, 23 Jan 1997; AM P13167, 1 ovigerous female (20.8 mm), E Tasmanian coast, 366–549 m, FRV *Derwent Hunter*, Jan 1955.

Diagnosis. Carapace cervical groove indistinct; without dorsal spines; frontal margins slightly oblique, with slender antennal spine and strong anterolateral spine followed posteriorly by 2 strong spines on hepatic margin. Rostrum broad, trifold distally. Third sternite about one-third width of sternite 4; posterior margin on sternite 3 broadly contiguous with anterior margin of sternite 4. Sternites smooth, unarmed. Abdominal tergites unarmed. Sixth tergite with posterior margin not strongly produced. Telson composed of 7 plates. Eyestalk unarmed, slightly movable, partially concealed by rostrum. Maxilliped 3 merus with slender distal extensor spine; flexor margin with two proximal spines and several small denticles. Pereopods without epipod. Cheliped elongate, shorter than twice carapace length; carpus with strong distal spines and with strong middorsal spine. Walking legs with spinose extensor margin; dactylus flexor margin with 6 or 7 stout triangular teeth, each bearing slender movable spine.

Description. *Carapace:* Moderately convex from side to side; sparsely covered with short, fine setae and fine pits; cervical groove indistinct; without dorsal spines. Frontal margins slightly oblique, with slender antennal spine and strong anterolateral spine followed posteriorly by 2 strong spines on hepatic margin; lateral margins subparallel, slightly wider anteriorly. Rostrum broad, about half remaining carapace length; trifold distally; apex spiniform, inclined dorsally; moderately carinate dorsally; lateral proximal margin straight. Anterior margin of pterygostomian flap with anterior spine.

Sternum: Third sternite about one-third width of sternite 4; posterior margin on sternite 3 broadly contiguous with anterior margin of sternite 4. Sternites smooth, unarmed.

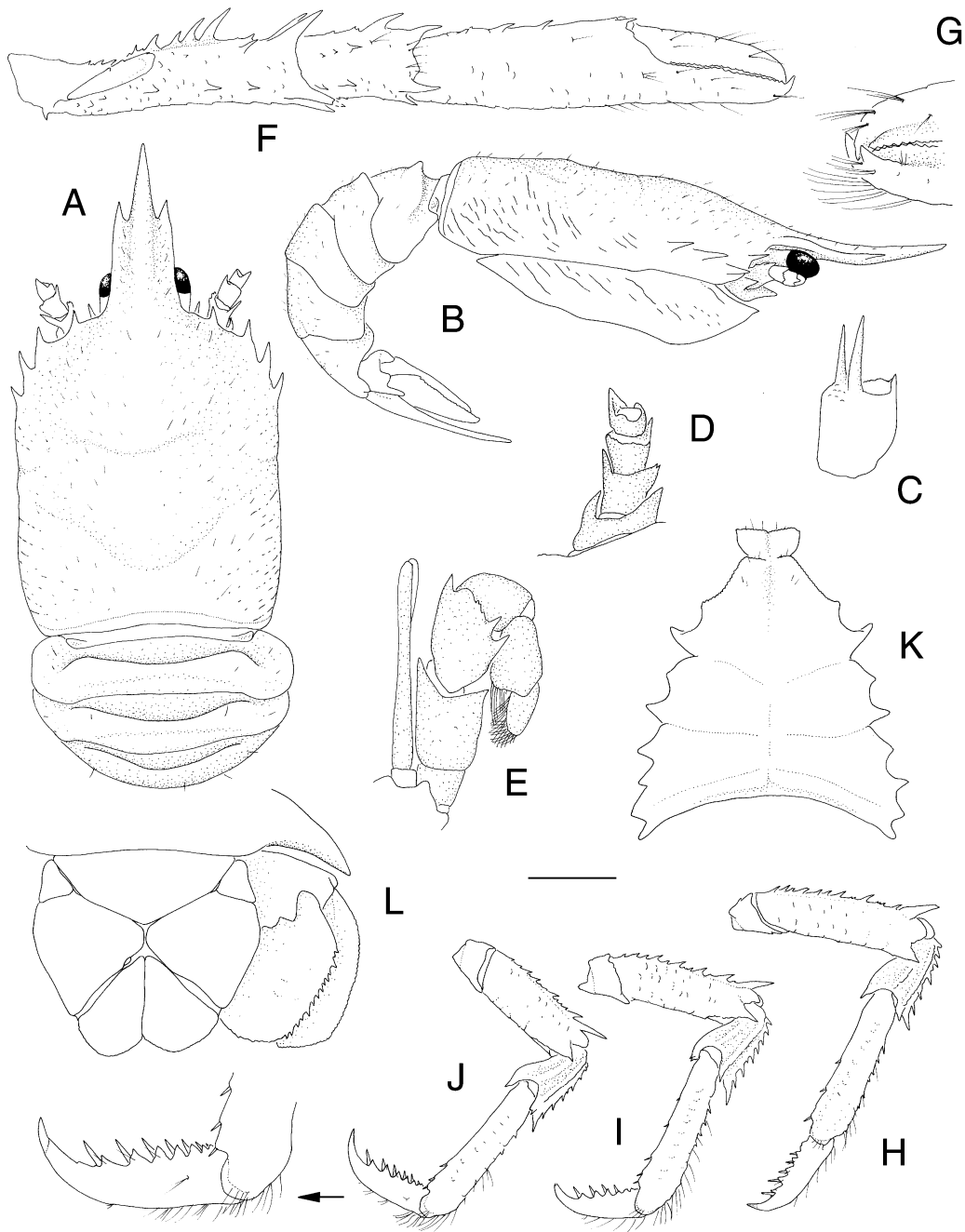


FIGURE 15. *Munidopsis treis* n. sp., holotype female (16.4 mm), SAM. A, dorsum. B, right lateral. C, right basal antennular segment, ventral. D, right antennal peduncle, ventral. E, right third maxilliped, lateral. F, right cheliped. G, right cheliped, inner distal. H–J, pereopods 2–4. K, sternum. L, telson. Scale A, B, F, H–J = 2 mm, C–E, G, L = 1 mm.

Abdomen: Tergites with short, fine, scattered setae, without spines. Second to fourth tergites with elevated anterior ridge; second and third also with shallow groove behind anterior ridge. Sixth tergite with posterior margin not strongly produced. Telson composed of 7 plates. Uropodal endopod with serrate lateral margins.

Eye: Ocular peduncle unarmed, non-setose; slightly movable; partially concealed by rostrum. Cornea subglobular, slightly wider than peduncle; with small spine between eyes and antennal peduncle.

Antennule: Basal segment with two distolateral spines; distomesial margin produced.

Antenna: Basal segment with mesial and lateral tooth. Second segment with strong distolateral spine; distomesial margin angular, apex sometimes bifid. Third segment with distomesial spine. Fourth segment with lateral triangular projection.

Maxilliped 3: Dactylus, propodus and carpus unarmed. Merus with slender distal extensor spine; flexor margin with two proximal spines and several small denticles.

Epipods: Pereopods 1–4 without epipods.

Pereopod 1 (cheliped): Elongate, shorter than twice carapace length; sparsely setose and rugose; subcylindrical to ovate. Propodus with 3–5 small spines on dorsal margin; palm about 3 times as long as high; dorsal margin of palm longer than dactylus. Pollex and dactylus with occlusal margins crenulate; distally slightly 'hollowed' on internal margin. Carpus with strong distal spines; with strong middorsal spine and smaller spines on lateral surfaces. Merus with strong distal spines and row of strong dorsal spines; with small spines on lateral surface. Ischium with ventrodorsal spine and row of dorsal spines.

Pereopod 2–4: Setose; slightly compressed. Merus with spinose extensor margin and distal triangular spine on flexor margin. Carpus with distal flexor spine and row of extensor spines; with 2 low, irregular, lateral carinae. Propodus extensor margin with row of small spines; flexor margin with 2–5 movable spines, distalmost paired. Dactylus flexor margin with 6 or 7 stout triangular teeth, each bearing slender movable spine.

Ovum: Diameter 1.5 mm.

Etymology. From the Greek *treis*, three, alluding to the trifid rostrum and presence of three lateral carapace spines.

Remarks. *Munidopsis treis* n. sp. closely resembles *Ms. serricornis* in having a trifid rostrum and in lacking epipods on the pereopods. *Munidopsis treis* is readily distinguished from *Ms. serricornis* in having three instead of four spines on the lateral margin of the carapace, in having many fewer and distinctly more widely spaced movable spines on the inner margin of the dactyli of the walking legs, in having a relatively longer dactylar apex, and in having a wider anterior margin of the fourth sternite which is in broad contact with the posterior margin of the third sternite. *Munidopsis treis* consistently bears one anterolateral and two hepatic spines on the carapace. Conversely, *Ms. serricornis* bears a fourth lateral carapace spine at the base of the branchial groove. *Munidopsis treis* further differs from Australian specimens of *Ms. serricornis* in lacking the pair of epigastric carapace spines.

The paratype of *Munidopsis treis* from Tasmania was misidentified with *Ms. serricornis* by Baba & Poore (2002) who nevertheless recognised the unusual spination of the dactyli of the walking legs.

Distribution. Tasmania and the Great Australian Bight; 366–820 m.

Paramunida Baba, 1988

Paramunida Baba, 1988: 175.

Remarks. The three species of *Paramunida* reported below represent the first records of the genus from southern Australia. *Paramunida scabra* (Henderson, 1885) was reported from northeast Queensland (Baba, 1994), but is not known from southern Australia. *Paramunida antipodes* n. sp. is described as new.

Key to *Paramunida* known from Australia

- 1 Distomesial spine of second segment of antennal peduncle more than triple-length of distolateral spine and more than half-length of distomesial spine of basal segment *P. granulata* (Henderson, 1885)
- Distomesial spine of second segment of antennal peduncle less than double-length of distolateral spine and less than half-length of distomesial spine of basal segment..... 2
- 2 Sternum with short striae over entire surface. Distomesial spine of second segment of antennal peduncle tapering evenly to acute apex 3
- Sternum with few striae, present anteriorly and laterally only. Margin of distomesial spine of second segment of antennal peduncle distally indented to form spiniform apex *P. antipodes* n. sp.
- 3 Carapace with 1 or 2 large mesogastric spines. Distomesial spine of second segment of antennal peduncle not overreaching distal peduncle segment *P. scabra* (Henderson, 1885)
- Carapace with median row of 3 or 4 large mesogastric spines and without protogastric spines. Sternum with striae over entire surface. Distomesial spine of second segment of antennal peduncle overreaching distal peduncle segment *P. thalie* Macpherson, 1993

Paramunida antipodes n. sp. (Fig. 16)

Type material. HOLOTYPE: AM P31419, male (11.9 mm), NE of Tweed Heads, Queensland, 28°05'S, 153°58'E, 420 m, K78-09-04, 1 Jun 1978. PARATYPES: AM P31420, 1

male (10.5 mm), type locality; AM P31515, 1 female (9.7 mm) NE of Long Reef, New South Wales, 33°41–39'S, 151°53–56'E, 485 m, trawl, K80-21-05, 16 Dec 1980; AM P31426, 1 female (11.9 mm), NE of Tweed Heads, 28°02'S, 153°59'E, 549 m, K78-09-05, 2 Jun 1978; AM P67171, 1 female (12.9 mm), NE of Tweed Heads, Queensland, 27°57'S, 154°03'E, 548 m, K78-23-04, 6 Nov 1978.

Diagnosis. Carapace with pair of epigastric spines and protogastric spines; with large mesogastric spine; cardiac region with longitudinal row of 2 or 3 spines; posterior margin with median spine; branchiocardiac region with longitudinal row of 3 spines on each side. Fourth sternite with several irregular transverse striae; fifth to seventh sternites with some short striae laterally. Basal antennular segment lateral margin with 4 or 5 small spines. First antennal segment with long, sinuous anteriorly directed mesial spine extending anteriorly almost to end of second segment of antennular peduncle. Second segment slender, with lateral and mesial distal spines; mesial spine distally indented to form spiniform apex, reaching beyond distal peduncle segment; lateral spine reaching beyond midlength but not beyond end of penultimate segment. Walking legs with propodus length about 9 times width.

Description. *Carapace:* Dorsum covered with numerous small spinules and granules; cervical groove distinct; with pair of epigastric spines and protogastric spines; with large median mesogastric spine; cardiac region with longitudinal row of 2 or 3 spines; posterior margin with median spine and numerous small spinules; branchiocardiac region with longitudinal row of 3 spines on each side. Frontal margin slightly concave; anterolateral spine extending slightly beyond base of sinus between rostrum and supraocular spines. Margins of carapace anterior to cervical groove with 2 spines (including anterolateral); with 6 spines posterior to cervical groove. Rostrum with low median carina, inclined slightly dorsally; not extending beyond cornea.

Sternum: Fourth sternite with several irregular transverse striae; fifth to seventh sternites with some short striae laterally.

Abdomen: Second and third tergites with 4 spines on anterior border (paired submedian spines and paired lateral spines) and 2 spines on posterior border (submedians); dorsum with irregular rows of granules and small spinules. Fourth tergite with 4 spines on anterior border (paired submedians and pair of laterals) and median spine on posterior border; dorsum with irregular rows of granules and small spinules. Fifth and sixth tergites covered with numerous arcuate striae.

Eyes: Maximum corneal width exceeding one-third distance between anterolateral spines; peduncle with setose dorsal striae and row of long distal setae ('eyelashes').

Antennule: Basal segment exceeding corneae; with 2 terminal spines, lateral distinctly longer than mesial; lateral margin with 4 or 5 small spines, setose.

Antenna: First segment with long, sinuous anteriorly directed mesial spine; setose laterally; extending anteriorly almost to end of second segment of antennular peduncle. Second segment slender, with lateral and mesial terminal spines; mesial spine distally

indented to form spiniform apex, reaching beyond distal peduncle segment; lateral spine reaching beyond midlength but not beyond end of penultimate segment.

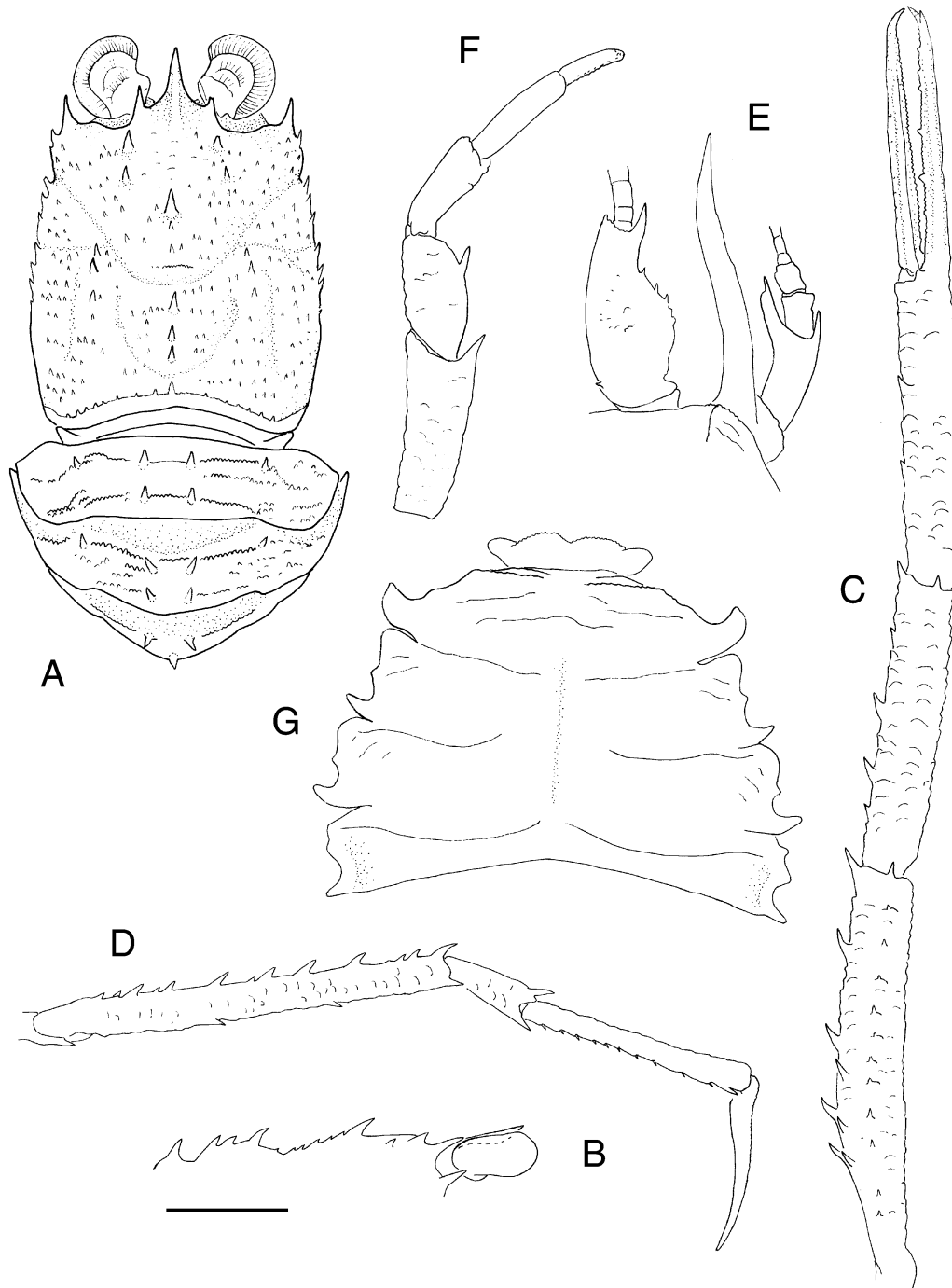


FIGURE 16. *Paramunida antipodes* n. sp., holotype male, (11.9 mm), AM P31419. A, dorsum. B, carapace, right lateral profile. C, right cheliped. D, right pereopod 2, dorsal. E, left antennule and antenna, ventral. F, right third maxilliped, lateral. G, sternum. Scale A–D = 4 mm, E–G = 2 mm.

Maxilliped 3: Merus flexor margin with strong median spine. Ischium with strong distal flexor spine.

Pereopod 1 (cheliped): Slender, squamate, subcylindrical, about 3.5 times carapace length. Dactylus slightly shorter than palm. Pollex with subterminal spine. Carpus with row of 3 dorsal spines, 2 distodorsal spines and 1 distoventral spine. Merus with irregularly spaced spines on dorsal lateral and mesial surfaces.

Pereopods 2–4: Merus extensor margin with 8–16 spines; flexor margin with 3 or 4 spines. Carpus with 1 or 2 extensor and 1 distal flexor spine. Propodus length about 9 times width; extensor margin unarmed; flexor margin with row of 8–13 movable spines. Dactylus sinuous, unarmed, about 0.7 propodus length.

Etymology. Named *antipodes*, an archaic vernacular name for Australia, as the first species of the genus to be described from Australian waters; used as a noun in apposition.

Remarks. *Paramunida antipodes* n. sp. most closely resembles *P. stichas* Macpherson, 1993b, but differs in bearing one instead of three large mesogastric spines, in bearing protogastric spines behind the epigastric spines, and three or four spines instead of one small spine on the lateral margin of the basal antennular segment. A 10.5 mm male (AM P31420) is infected by a bopyrid isopod beneath the right posterior portion of the carapace.

Distribution. Eastern Australia from Long Reef, New South Wales, to northeast of Tweed Heads, southern Queensland; 420 and 548 m.

Paramunida granulata (Henderson, 1885)

Munida granulata Henderson, 1885: 409; 1888: 133, pl. 14: figs. 3a–b (part) [type locality: Fiji].
Paramunida granulata. — Macpherson, 1993: 452–454, figs. 3, 13.

Material examined. QUEENSLAND: AM P42264, 2 males (10.4–11.1 mm), NE of Tweed Heads, 27°57'S, 154°03'E, 548 m, K78-23-04, 6 Nov 1978.

Remarks. The Australian specimens agree well with Macpherson's (1993) redescription of the species.

Distribution. Western Pacific from New Caledonia, Loyalty Islands, Futuna Island, Fiji, southern Indonesia and now from eastern Australia.

Paramunida thalie Macpherson, 1993

Paramunida thalie Macpherson, 1993b: 467–469, fig. 10 [type locality: Loyalty Islands].

Material. QUEENSLAND: AM P48961, 2 males (9.6–13.1 mm), 2 females (11.8–12.8 mm), E of Swains Reef, 22°24.36'S, 153°24.71'E, 210 m, QLD-1270, FV *Capricorn I*, J. Lowry & K. Dempsey, 16 Sep 1995.

Remarks. The Australian specimens agree well in most respects with the type material in the Muséum national d'Histoire naturelle, Paris, differing only in having more spinules on the carapace surface.

Distribution. Loyalty Islands and now from eastern Australia; 210–283 m.

***Raymunida* Macpherson & Machordom, 2000**

Raymunida Macpherson & Machordom, 2000: 253.

Remarks. Macpherson & Machordom (2000, 2001) erected *Raymunida* for species previously placed in *Munida* that bear an epipod on the first three pereopods and a frontal spine mesiad to the anterolateral spines on the carapace. Two species of *Raymunida* are presently known from the study area, of which one is a new record for Australia. Macpherson & Machordom (2001) and Lin *et al.* (2004) provide keys to the species of *Raymunida*.

***Raymunida elegantissima* (de Man, 1902)**

Munida elegantissima de Man, 1902: 726, pl. 24, figs. 42, 42a, b [type locality: Malay Archipelago] — Haig, 1973: 270–271.

Raymunida elegantissima. — Macpherson & Machordom, 2001: 703, fig. 1 E–H. — Davie, 2002: 67.

Material examined. WESTERN AUSTRALIA: WAM C323, 1 female (14.1 mm), between Fremantle and Geraldton, 146–220 m, trawled, FIS *Endeavour*, W. B. Alexander, 1912.

Remarks. *Raymunida elegantissima* was first reported from Australia by Haig (1973) on the basis of the present specimen (as *Munida elegantissima*). Although badly fragmented, enough of the specimen remains to verify its identity as *R. elegantissima* as redescribed by Macpherson & Machordom (2001). In view of the reported range of *R. elegantissima* reported by Macpherson & Machordom (2001) (i.e., western Pacific), the Western Australian locality of the present specimen might give pause to its identity. The presence of numerous tropical species off western and southwestern Australia, however, is not unusual owing to the effects of the Leeuwin current. Haig (1973) noted examining additional specimens of *M. elegantissima* from various northern Australian localities. These northern Australian records require verification in the light of the revisionary studies by Macpherson & Machordom (2000, 2001).

Distribution. Malaysia, Philippines, Western Australia, and New Caledonia to Fiji; 50–160 m (Macpherson & Machordom 2001).

Raymunida formosanus Lin, Chan & Chu, 2004 (Fig. 17)

Raymunida formosanus Lin, Chan & Chu, 2004: 149–156, figs. 1–3 [type locality: Tai-Shi, NE Taiwan].

Material examined. NEW SOUTH WALES: AM P26582, 1 female (19.7 mm), E of Crowdy Head, 31°54'S, 153°00'E, 104 m, K77-13-02, 17 Aug 1977.

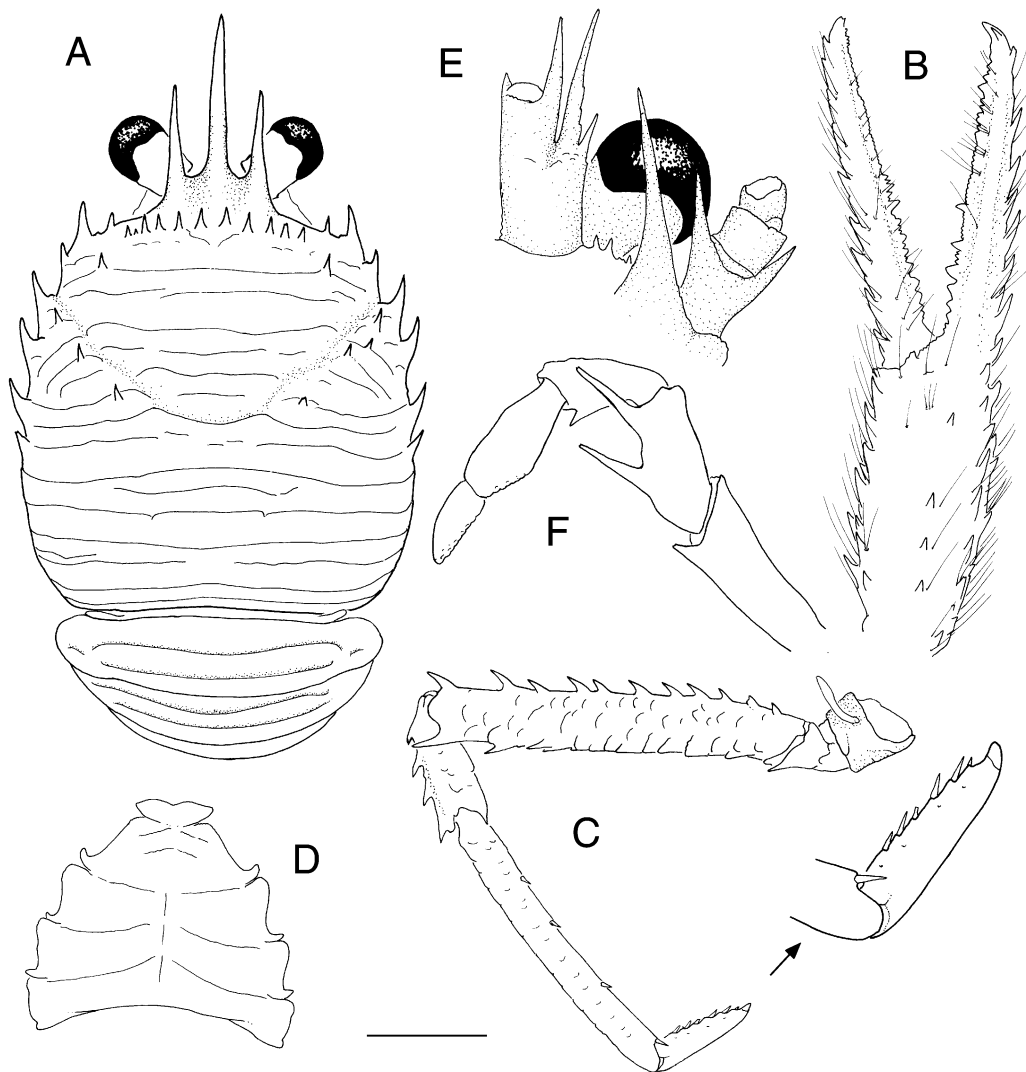


FIGURE 17. *Raymunida formosanus* Lin, Chan & Chu, 2004, female (19.7 mm), AM P26582. A, dorsum. B, right chela. C, left pereopod 2, dorsal. D, sternum. E, left antennule and antenna, ventral. F, left third maxilliped, lateral. Scale A–D = 4 mm, E–F = 2 mm.

Remarks. The single Australian specimen is badly fragmented but is tentatively identified with *R. formosanus*, described from Taiwan. The present specimen agrees well with the type description, notably in the relatively robust chelae (being 5 times as long as wide in females) and in the distinctly squamose meri of the walking legs, features that distinguish *R. formosanus* from the very similar New Caledonian species *R. confundens* Macpherson & Machordom, 2001. It differs from the type description in having spines along most of the length, instead of primarily on the proximal half of the lower margin of the pollex of the cheliped. The significance of this difference in chela spination is not readily apparent. It could represent specific distinction or merely intraspecific variation. Additional intact Australian specimens are required to settle the issue.

Distribution. Northeastern Taiwan and now from eastern Australia at depths between 104 and 300 m.

Discussion

Twenty-nine species of deep-water Galatheidae are reported above. Thirty-six species in five genera of deep-water Galatheidae are now known between southern Western Australia and southern Queensland; 5 of *Agononida*, 12 of *Munida*, 15 of *Munidopsis*, 2 of *Paramunida*, and 2 of *Raymunida*. *Paramunida* and *Agononida* are reported for the first time from southern Australia, with a new species of each described. Seven new species of *Munida* are described, increasing the known Australian species from 12 to 19. Four new species of *Munidopsis* are described and three are newly recorded for the region increasing the known Australian fauna from 11 to 18. *Paramunida granulata*, *P. thalie* and *Raymunida formosanus* are reported from Australia for the first time. Although genera of small bodied, mostly shallow water species, such as *Galathea* Fabricius, 1793, *Allogalathea* Baba, 1969, and *Phylladorhynchus* Baba, 1969 were not considered here, the present results increase the known Australian galatheid fauna from 55 to 74 species. Many species reported herein are presently known only from Australian waters, namely, *Agononida pro-cera*, *M. aequalis*, *M. asprosoma*, *M. chydaea*, *M. endeavouri*, *M. haswelli*, *M. isos*, *M. kapala*, *M. rubridigitalis*, *M. spinicruris*, *Ms. proales*, *Ms. tasmaniae*, *Ms. treis* and *P. antipodes*. Whether these species are Australian endemics must await study of the galatheid faunas elsewhere in the Indo-Pacific. Many species of *Munidopsis* range widely in the Indo-Pacific or even worldwide, including some species reported herein such as *Ms. centrina*, *Ms. kensleyi*, *Ms. rostrata*, *Ms. serricornis* and *Ms. subsquamosa*. Thus, it would not be unexpected to discover the other species of Australian *Munidopsis* elsewhere in the Indo-Pacific. Of the species of *Agononida* reported here, most also exhibit relatively wide, tropical Indo-West Pacific ranges, such as *A. eminens* (western Pacific), *A. incerta* (western Indian Ocean to western Pacific), and *A. squamosa* (western Oceania). Conversely, most species of *Munida* reported here, many being temperate water species, seem to be less wide ranging. The new species of *Munida* described herein are presently known only

from Australian localities, as are the previously described species *M. haswelli* and *M. rubridigitalis*. *Munida gregaria* is a significant exception in ranging widely in the Southern Ocean between Australia, New Zealand and southern South America. Although knowledge of the alpha-level diversity of deep-water Galatheidae has markedly increased in the last two decades, too little is currently known of the actual range of most species to facilitate satisfactory biogeographic analysis. As indicated by Davie (2002), the Australian Galatheidae is still poorly known and considerably more taxonomic study is required before the fauna can be regarded as well characterised.

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