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# New records of *Munidopsis* (Crustacea: Anomura: Galatheidae) from New Zealand with description of two new species from a seamount and underwater canyon

KAREEN E. SCHNABEL[1,2] & NIEL L. BRUCE[1]

[1]*Marine Biodiversity & Biosecurity, National Institute of Water & Atmospheric Research, Private Bag 14901 Kilbirnie, Wellington, New Zealand. E-mails: k.schnabel@niwa.co.nz; n.bruce@niwa.co.nz*
[2]*Department of Marine Science, University of Otago, P. O. Box 56, Dunedin, New Zealand*

## Abstract

Three species of the genus *Munidopsis* are currently known from New Zealand waters: *M. marginata* (Henderson, 1885), *M. kaiyoae* Baba, 1974 and *M. abyssicola* Baba, 2005. New records for *M. marginata* and *M. kaiyoae* around New Zealand are provided and *Munidopsis maunga* n. sp. and *M. papanui* n. sp. are described from a seamount on the Kermadec volcanic arc and the Papanui canyon off the southeast coast of New Zealand, respectively.

**Key words:** Anomura, Galatheidae, *Munidopsis*, New Zealand, Kermadec volcanic arc, seamount, underwater canyon

## Introduction

The New Zealand Galatheoidea remain poorly documented, with sporadic records dating from the *Challenger* Expedition in years 1873–1876. Five publications have since described new species of Galatheoidea from New Zealand waters (Henderson 1885, Borradaile 1916, Baba 1974, Vereshchaka 2005 and Baba 2005) and at present a total of 19 species of Galatheoidea are known from New Zealand, including three species of the genus *Munidopsis*.

*Munidopsis* currently comprises more than 150 species worldwide, which occur from the shelf to abyssal depths, with a greatest recorded depth of >5300 m (Macpherson & Segonzac 2005). *Munidopsis* species are abundant in all deep-sea habitats and they comprise an important element of the scavenging macrofauna of hydrothermal vents along the Atlantic and Pacific Ocean ridges and around cold seeps and whale and wood falls

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(Williams & Turner 1986, Chevaldonné & Olu 1996, Tunnicliffe *et al*. 1998, Goffredi *et al*. 2004, Macpherson & Segonzac 2005, Martin & Haney 2005). Despite their abundance, the systematics and biology of this genus remains poorly known and large oceanic regions remain understudied.

The distribution and taxonomy of *Munidopsis* in the southwest Pacific has recently received some attention (Baba 1994, Baba & Poore 2002, Ahyong & Poore 2004, Baba 2005), which has increased known species from Australia, for example, to 21 (including the Tasman Sea and Lord Howe Ridge northwest of New Zealand). In addition, five species of *Munidopsis* are now known from the Fiji region, including species taken from hydrothermal vents in the Fiji and Lau basins (Baba 1995, Baba & de Saint Laurent 1992). *Munidopsis* is relatively speciose and abundant worldwide, particularly from localities in close proximity to New Zealand. Therefore a taxonomic study of New Zealand galatheids would be expected to significantly increase the known local diversity of the genus.

Three species of *Munidopsis* have been recorded from New Zealand waters: *Munidopsis marginata* (Henderson, 1885) known from one station off the east coast of New Zealand (*Challenger* Expedition) and, more recently, off New South Wales, Australia (Baba & Poore 2002); *M. kaiyoae* Baba, 1974, known from two locations off the South Island of New Zealand (Baba 1974, Khodkina 1981); and *M. abyssicola* Baba, 2005, described from off north-eastern New Zealand (*Galathea* Expedition), but also recently been found in the northeast Atlantic and off Namibia (Macpherson & Segonzac 2005).

Here, we provide first results of a taxonomic study into New Zealand Galatheoidea including two new species and new records for two of the known New Zealand species, *M. marginata* and *M. kaiyoae*. *Munidopsis maunga* n. sp. is recorded from one site within the caldera of the hydrothermally active Macauley seamount on the Kermadec volcanic arc and *M. papanui* n. sp. is described from one site within the Papanui Canyon off the Otago shelf in southeastern New Zealand (Fig. 1). Including these records, five species of *Munidopsis* are now known from New Zealand, all from depths greater than 420 m. Three of these are not currently known outside New Zealand: *M. maunga* n. sp. and *M. papanui* n. sp. are only known from a single location but *M. kaiyoae* Baba, 1974 appears to be relatively common on and along the margins of the New Zealand shelf.

## Material and methods

The material reported on here was collected by the National Institute of Water and Atmospheric Research (NIWA) and the Portobello Marine Biological Station, Otago Harbour, New Zealand (PMBS). Measurements of specimens, given in millimetres (mm), indicate the carapace length (cl) including the rostrum. The range of measurements of the specimens are given with the holotype measurements indicated in square brackets. Drawings were made using a WACOM Intuous3 Graphics Tablet and Adobe Illustrator CS2. Specimens examined are deposited in the NIWA Invertebrate Collection and the

  

National Museum of New Zealand Te Papa Tongarewa (NMNZ). Descriptions were prepared using DELTA (Descriptive Language for Taxonomy: Dallwitz *et al*. 1997).

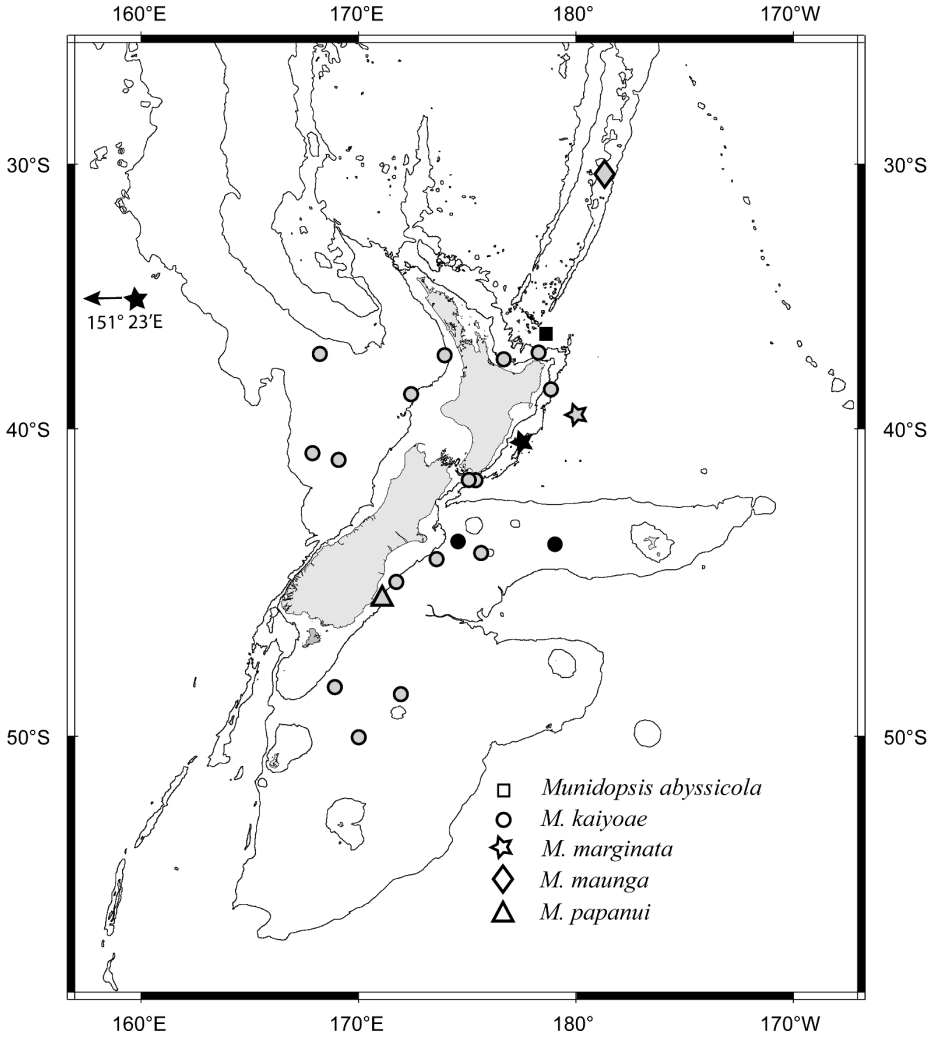


**FIGURE 1**. Station records of the currently known species of *Munidopsis* (solid symbols) and new records (open symbols) around New Zealand. 250 m and 2000 m bathymetric contours are shown.

## Taxonomy

## Order Decapoda

## Family Galatheidae Samouelle, 1819

## Genus *Munidopsis* Whiteaves, 1874

See Baba (2005) for full synonymy, diagnosis and species list for Indo-Pacific species.

  

*Remarks*

Presently, 122 species of *Munidopsis* are known in the Indo-Pacific region (Baba 2005), which is somewhat higher than in the Atlantic where 70 species are currently known (including those species that occur in multiple oceanic basins). Recent monographic accounts are Ahyong & Poore (2004) on the eastern Australian fauna (reporting two known species and adding four new species) and Baba's (2005) *Galathea* report (describing 10 new Indo-Pacific species including one from New Zealand). The prevalence of *Munidopsis* as a conspicuous element at hydrothermal vents and cold seeps has stimulated two recent publications providing valuable information on aspects of the biology and biogeography of this genus. Macpherson & Segonzac (2005) documented 22 species of deep-sea *Munidopsis* from vent and seep habitats across the Atlantic Ocean, and Martin & Haney (2005) recently presented a review of 125 species of decapods from hydrothermal vents and cold seeps worldwide, which included 11 species of *Munidopsis* from sites in the North Atlantic, Gulf of Mexico, Indo-West Pacific and East Pacific.

### ***Munidopsis kaiyoae*** **Baba, 1974**

(Fig 2)

*Munidopsis kaiyoae* Baba, 1974: 390, figs. 8, 9.— Khodkina, 1981: 1263.— Baba, 2005: 282 (key), 290 (list).

*Type locality*: Off the east coast of South Island, New Zealand, 44°20.50'S, 179°17.50'W, 750 m.

*Material examined*

1 ♀ (paratype, 20 mm), Chatham Rise, east of South Island, 44°20.50'S, 179°17.50W, 15 July 1968, 750 m, *Kaiyo Maru* stn 33 (NMNZ CR.1925). 1 ♀ (ovig. 22 mm), Pukaki Rise, south of South Island, 48°45.00'S, 172°0.00'E, 20 January 1965, 658 m, stn. F107 (NIWA 19176). 1 ♂ (14 mm), Challenger Plateau, west of North Island, 37°30.47'S, 168°35.24'E, 22 March 2002, 966 m, stn. Z11036 (NIWA 19177). 1 ♂ (26 mm), off Otago, South Island, 45°12.10'S, 171°43.59'E, 11 October 1965, 594 m, stn. E413 (NIWA 19178). 1 ♀ (28 mm), Hikurangi Trough, off south of North Island, 41°40.41'S, 175°15.24'E, 30 March 1967, 618 m, stn. E752 (NIWA 19179). 1 ♂ (18 mm), Challenger Plateau, west of North Island, 38°38.60'S, 172°37.59'E, 28 March 1968, 691 m, stn. E906 (NIWA 19180). 1 ♂ (17 mm), Chatham Rise, 44°15.0'S, 175°25.59'E, 17 August 1966, 594 m, stn. F750, (NIWA 19181). 1 ovig. ♀ (17 mm), Challenger Plateau, 40°46.00'S, 167°54.54'E, 18 April 1980, 1029 m, stn. P928 (NIWA 19182). 2 ovig ♀♀ (18 mm, 21 mm), Challenger Plateau, P942 (NIWA 19183). 1 ♂ (15 mm), Challenger Plateau, 41°0.36'S, 169°5.60'E, 24 April 1980, 914 m, stn. P942 (NIWA 19186). 1 ♂ (20 mm), Bay of Plenty, east of North Island, 37°32.33'S, 176°48.36'E, 18 January 1998, 550 m, stn. KAH9801/5 (NIWA 19184). 1 ♂ (16 mm), Raukumara Plain, east of North Island, 38°46.00'S, 178°48.00'E, 23 March 1967, 913 m, stn. E719 (NIWA 19185). 1 ♂ (8 mm),

  

Chatham Rise, 44°19.18’S, 173°35.30’E, 28 October 1979, 525 m, stn. S159 (NIWA 19187). 1 ♂ (18 mm), Hikurangi Trough, 42°1.48’S, 174°26.30’E, 30 March 1967, 885 m, stn. E756 (NIWA 19188). 1 ♀ (16 mm), Pukaki Rise, 50°0.00’S, 170°0.00’E, 20 February 1970, 608 m, stn. H55 (NIWA 19189). 1 ♀ (23 mm), Hikurangi Plauteau, off East Cape, North Island, 37°19.30’S, 178°10.59’E, 03 October 1968, 1050 m, stn. F873 (NIWA 19190). 1 ♂ (15 mm), North Taranaki Bight, off west of North Island, 37°19.59’S, 173°56.60’E, 24 March 1968, 728 m, stn. E894 (NIWA 19191). 1 ♂ (16 mm), Pukaki Rise, 48°31.59’S, 168°54.29’E, 18 January 1965, 706 m, stn. F99 (NIWA 19192).

*Remarks*

All specimens can be confidently identified from the description given by Baba (1974) based on three females from one location on the Chatham Rise. The new material examined includes seven females and ten males from 16 locations (Fig. 1). There is some variation in spination of the gastric and cardiac regions and of the posterior margin of the dorsal carapace as indicated by Baba (1974). A single specimen from the North Taranaki Bight (NIWA 19191) has a small mesogastric spine behind the typical epigastric, protogastric and cardiac spines.

In all but one specimen (NIWA 19182), the distomesial margin on the antennule is produced to an acute spine preceded by a row of tubercles. Baba (1974) illustrated the antennule of the holotype with a slightly produced margin with a few tubercles. Paratype CR.1925, however, examined here, had an acute spine similar to that found more commonly in the material examined. Therefore, the antennule is figured from the female paratype (Fig. 2).

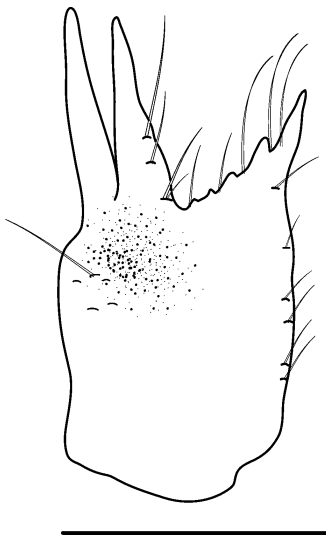

**FIGURE 2**. *Munidopsis kaiyoae* Baba 1974, paratype, ♀, NMNZ CR. 1925, right antennule, ventral. Scale: 2 mm.

  

Cheliped length is sexually dimorphic, with male chelipeds generally longer than female chelipeds (1.54–2.65 times as long as carapace, including rostrum, measured from tip of the dactylus to the proximal end of the merus), and in females chelipeds are 1.17–1.65 [female paratype = 1.55] times as long as the carapace, including rostrum.

*Distribution*

*Munidopsis kaiyoae* is thought to be a New Zealand endemic, previously known from two stations on the Chatham Rise. The distribution is extended geographically to the north and east and it is now known to occur across the New Zealand continental shelf and slope between 37° and 50°S (Fig. 1). Its depth range is extended from the currently known 720–750 m to 525–1050 m.

### *Munidopsis marginata* (Henderson, 1885)

*Elasmonotus marginatus* Henderson, 1885: 416; 1888: 161, pl. 19: figs. 2, 2a.— Thomson, 1899: 196 (list).
*Munidopsis marginata*.— Döflein & Balss, 1913: 176 (list).— Baba & Poore, 2002: 237, fig. 4.— Baba, 2005: 280 (key), 291 (list).
*Type locality.* East of southern North Island, New Zealand, 40°28’S, 177° 43’E, 2013 m.

*Material examined*

1 ♂ (17 mm), Young Nick’s seamount, Hikurangi Plateau, 39°27.11’S, 179°57.44’E, 19 November 2004, 2308–2207 m, stn. TAN0413/193 (NIWA 9025). 1 ♀ (19 mm), Young Nick’s seamount, Hikurangi Plateau, 39°27.29’S, 179°55.29’E, 20 November 2004, 2127–2130 m, stn. TAN0413/201 (NIWA 9026).

*Remarks*

Both specimens conform well to the illustrations of Henderson (1888) and Baba & Poore (2002). New Zealand material shares the rudimentary epigastric processes with the illustrated specimen of Baba & Poore (2002), whereas Henderson’s (1888) figure shows small but more distinct epigastric spines, a character that is often variable in species of *Munidopsis*. A slight variation in the female (NIWA 9026) is a more acute distolateral spine on each of the first antennal segments than illustrated by Baba & Poore (2002). The male (NIWA 9025) has a more blunt lateral process on the first antennal article as previously illustrated. The largest New Zealand specimen (cl = 19 mm) is slightly larger than the Australian specimen (cl = 15.3 mm) and smaller than the female *Challenger* specimen (cl = 36.5 mm). Measurements for the second and smaller female specimen described by Henderson (1885) are only given for the full body (35 mm), which is comparable to the present material (36 mm ♀ and 30 mm ♂ full body length).

  

*Distribution*

Previously known from the northeastern coast of New Zealand (Hikurangi Trough) and southeastern Australia (Fig. 1). The present records are from a seamount within 100 km of the type locality. Baba (2005) reported a bathymetric range of 1750–2013 m. The present records extend the known depth range to 2308 m.

***Munidopsis maunga* n. sp**
(Fig 3)

*Material examined*

HOLOTYPE: ♂ (9.9 mm), Macauley volcano caldera, Kermadec volcanic arc, New Zealand, 30°10.09'S, 178°29.89'W, 22 April 2002, 751–636 m, Stn TAN0205/60 (NIWA 21138). PARATYPES: 3 ♂♂ (8.7, 8.0, 9.8 mm), same data as holotype (NIWA 21139 and NMNZ CR.10022).

*Diagnosis*

Carapace smooth; with 2 small epigastric spines. Frontal margin oblique; antennal spine present, stronger than anterolateral spine. Lateral margin with 1 spine posterior to anterolateral spine. Rostrum short, triangular, unarmed laterally, horizontal. Abdominal tergites unarmed; telson composed of 12 plates. Eyestalk immovable, eye-spine absent, cornea subglobular. Antennule with 2 terminal and 1 small dorsolateral spine. Cheliped elongate, moderately setose and granulate; merus with 3 longitudinal rows of spines (dorsal, mesial and ventral), continued on carpus by single row of tubercles; propodus unarmed; opposable margins of fingers not gaping. Walking legs sparsely setose; pereopod 2 not overreaching end of pereopod 1; dorsal margin of merus with row of spines along proximal half; carpus only with distal spine on dorsal margin; dactylus about half as long as propodus. P1–4 without epipods.

*Description*

*Carapace*: 1.4–1.5 [1.41] times as long as broad (including rostrum), moderately convex laterally. Dorsal surface smooth, covered with a few short striae. Frontal margin oblique. Cervical groove shallow, distinct; carapace unarmed except for paired small epigastric spines. Antennal spine directed anteriorly, larger than anterolateral spine. Anterolateral margin with well-developed spine; lateral margins subparallel, slightly wider posteriorly, with 1 branchial lateral spine directly posterior to cervical groove (followed by serration). Posterior margin unarmed. Rostrum 0.1 times the length of remaining carapace, narrowly triangular, unarmed, horizontal; dorsal surface smooth and sparsely setose; lateral margin smooth. Pterygostomian flap lateral surface with short striae, anterior margin rounded.

*Sternum:* sternite 3 3.0–3.5 [3.2] times as wide as long; anterior margin bilobed and serrated, with shallow central notch; lateral margins rounded, curved anteriorly; surface

  

smooth. Sternite 4 2.0–2.2 [2.2] times as wide as sternite 3; anterior margin narrowed, shallowly convex; anterior midline shallowly grooved; surface smooth, unarmed. Ridges demarcating sternites 4–7 with rows of setae, surfaces smooth.

*Abdomen*: tergites smooth, unarmed, sparsely setose; tergite 2 with central transverse groove. Telson 1.3–1.5 [1.5] times as broad as long, composed of 12 plates; lateral margin with row of plumose setae and small spines; uropodal endopods with short rows of spines on surface; lateral margins with a row of spines and plumose setae.

*Eyes*: smooth, immobile; eye spine absent. Cornea subglobular, 0.7–0.9 [0.7–0.8] as wide as peduncle, with small spine between eye and antennal peduncle.

*Antennule*: surface smooth; distolateral spine well developed, distomesial spine small; lateral margin swollen, with small dorsolateral spine directed anteriorly.

*Antenna*: article 1, distomesial and distolateral margins with each short spine (not reaching the end of article 2); article 2 with small distolateral spine; article 3 with blunt distomesial spine.

*Maxilliped 3*: surface smooth; ischium with small distal spine on extensor margin, 16–23 [19–23] teeth on mesial ridge; merus extensor margin with small distal spine, flexor margin with 2 proximal spines and small distal spine; carpus, propodus and dactylus unarmed.

*Pereopod 1 (cheliped):* elongate, 2.4–2.7 [2.6] times as long as carapace (including rostrum); surface moderately setose and granulate; ischium with small distodorsal spine. Merus with 3 longitudinal rows of large spines on dorsal, mesial and ventral margins; 4 distal spines. Carpus sparsely tuberculate, including distinct longitudinal row of tubercles, with 4 distal spines, carpus length 0.4–0.5 [0.4] times as long as that of palm. Propodal palm 3.4–4.5 [4.3] times as long as high, sparsely covered with long setae and unarmed. Dactylus 0.4 times as long as propodus; opposable margins not gaping, occlusal margin denticulate.

*Pereopods 2–4*: surface slightly setose; pereopod 2 anteriorly slightly overreaching base of palm of pereopod 1. Merus with 4–8 [5] spines along proximal half of dorsal crest (including distal spine), 0.8–1.0 times as long as propodus. Carpus with distal spine on dorsal margin and 1 small blunt distal spine on ventral margin. Propodus extensor margin smooth. Dactylus straight; 0.5–0.6 [0.5] times as long as propodus; flexor margin with inclined setae along distal half, with 8–13 [10–13] inclined setae (excluding distal spine). P2–4 meri decreasing in length (and spination) posteriorly.

*Epipods:* absent from P1–4.

*Colour*

Not known.

*Variation*

The type material contains males of similar size exhibiting only minor morphometric and meristic variation from the holotype.

  

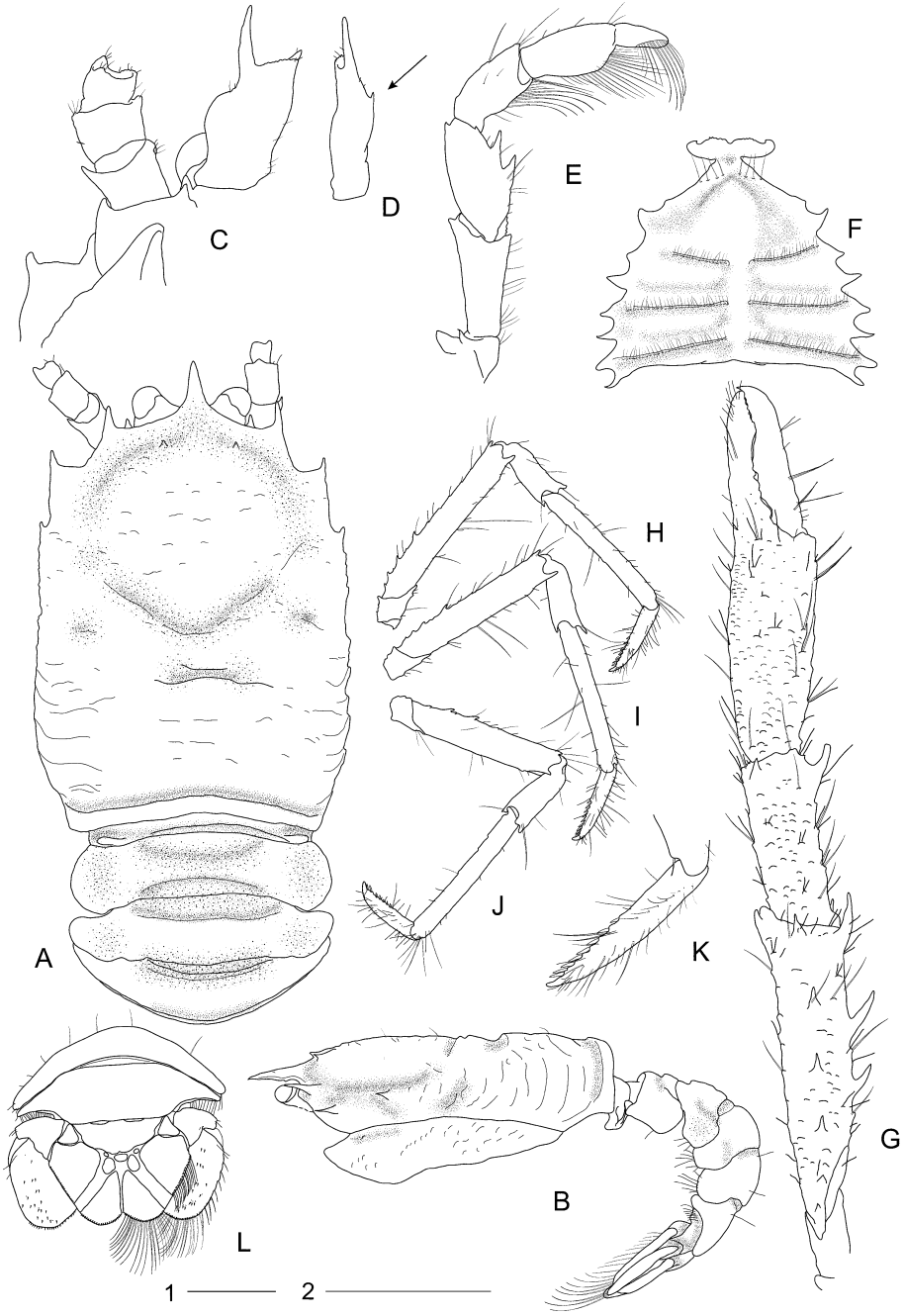


**FIGURE 3**. *Munidopsis maunga* n. sp., A, B, F, L: holotype, ♂, NIWA 21138, C–E: paratype, ♂, NIWA 21139, G–K: paratype, ♂, NMNZ CR. 10022. A, carapace and abdomen, dorsal; B, carapace and abdomen, lateral; C, anterior part of cephalothorax, showing right antennule, antenna and ocular peduncle, ventral; D, lateral view of right antennule showing dorsolateral spine (arrowed); E, right third maxilliped, lateral; F, sternal plastron; G, left cheliped, dorsal; H–J, right pereopods 2–4, lateral; K, dactylus of right pereopod 2, lateral; L, posterior part of abdomen with uropods and telson. Scale: 2 mm (scale 1 for A, B, F–J, L; scale 2 for C–E, K).

  

*Remarks*

*Munidopsis maunga* n. sp. can be readily distinguished from all other species in the genus by the combination of the short rostrum, strong antennal and anterolateral spines, single lateral spine posterior to the anterolateral spine, smooth carapace and abdomen (except for the small epigastric spine) and the dorsolateral spines on the antennule.

The morphology of *Munidopsis maunga* n. sp. is most similar to *M. polymorpha* Koelbel, 1892, *M. milleri* Henderson, 1885, *M. goodridgii* Alcock & Anderson, 1899 and *M. spinipes* MacGilchrist, 1905. *Munidopsis maunga* differs from *M. polymorpha* by the much more convex frontal margin, the pair of epigastric spines, smooth carapace (without small tubercles on the posterior quarter), the width of the propodus of the third maxilliped being narrower and lacking a terminal lobe, and the size of the cheliped (length-width ratio is 5.8 in *M. polymorpha* and 9.2 in *M. maunga*). *Munidopsis maunga* differs from *M. milleri* and *M. goodridgii* in the lack of protogastric, postcervical, cardiac and branchial spines and in having a single spine along the lateral margin of the carapace directly posterior of the cervical groove. The maximum length of the carapace and body of *M. maunga* (cl = 9.9 mm, body length = 19 mm) is also considerably shorter than those of the similar species *M. milleri* (cl = 16 mm, body length = 27–33 mm), *M. spinipes* (body length = 30.5 mm) and *M. goodridgii* (cl = 21.5 mm) but similar to *M. polymorpha* (body length = 23 mm).

*Munidopsis maunga* further differs from *M. goodridgii* in that the cheliped in *M. maunga* is much longer in relation to carapace length (2.4–2.7 times cl) compared with *M. goodridgii* (1.5–2.0). However, *M. maunga* is described solely from males while *M. goodridgii* was described solely from females. Therefore, until the degree of sexual dimorphism can be evaluated for both species, the cheliped length as a distinguishing feature should be used cautiously.

*Munidopsis maunga* can be distinguished from *M. spinipes* by the lacking rows of spines on the carpus of the cheliped and the unarmed instead of spinose propodus of the cheliped. Also, the meri of the walking legs only have spines along the proximal half of the dorsal margin and the carpus is unarmed except for a distal tooth in *M. maunga* where *M. spinipes* has spines almost along the entire margin of the meri and carpi.

*Munidopsis polymorpha* is known from a shallow anchialine cave system on Lanzarote, Canary Islands. *Munidopsis goodridgii, M. milleri* and *M. spinipes* are known only from the Indian Ocean, at depths of 920–1920 metres. No apparently closely related species are known from the Pacific Ocean.

*Munidopsis maunga* was taken from within the caldera of Macauley volcano within the Kermadec volcanic arc (Fig. 1). The caldera is dotted with hydrothermal vents and small cone volcanoes spanning an area of approximately 10.8 by 8.2 km (Wright *et al.* 2006). The exact collecting location of the specimens in relation to the active vents on the caldera is not known but some *Munidopsis* species are known to occur in immediate proximity to active hydrothermal vents as well as the surrounding slopes covered by

  

hydrothermal and biogenic sediments where they are assumed to be vagrant species. It is assumed that thermal-vent species are opportunists that benefit from the localized and increased chemoautotrophic production (Macpherson & Segonzac 2005, Martin & Haney 2005).

*Distribution*

Known only from the type locality, the Kermadec volcanic arc, New Zealand; 751–636 m.

*Etymology*

Maunga is a Māori word for mountain, with reference to the type locality, the Macauley volcano on the Kermadec volcanic arc, New Zealand.

***Munidopsis papanui* n. sp.**
**(Figs 4–6)**

*Material examined*

HOLOTYPE: ♂ (7.7 mm), Papanui Canyon, New Zealand, 45°51.40’ S, 171°01.00’E, 13 June 1973, 420 m, coll. PMBS, stn. Z15078 (NMNZ CR. 10023). PARATYPE: 1 ♀ (8.1 mm), same data as holotype (NIWA 21140).

*Diagnosis*

Dorsal surface densely covered with sparsely setose tubercles and serrated processes, deeply sculptured; cervical groove distinct; distinct paired processes in gastric and postcervical regions. Frontal margin with strong antennal process; anterolateral margin square; lateral margins with 3 blunt processes; posterior margin with transverse row of spines and serrations along entire margin. Rostrum triangular, slightly less than one-third length of remaining carapace. Abdominal tergites strongly sculptured; tergites 2 and 3 with strong blunt median process. Eyestalk not movable; with papillate, tuberculate processes mediodorsally and 1 lateroventral eye spine. Antennule cristate dorsolaterally; with 3 distal spines. Antenna article 3 with 3 blunt distal teeth. Cheliped elongate, 1.6 (female) to 2.0 (male) times as long as carapace; surface setose, spinose, and covered with tubercular processes; with row of spines along dorsal propodal margin. Walking legs not exceeding end of chelipeds, covered with tubercular processes; dactyli with 13–14 inclined setae along flexor margin. Pereopods 1–3 with epipods.

*Description*

*Carapace:* 1.3–1.4 [1.35] times as long as broad (including rostrum), moderately convex from side to side. Dorsal surface sparsely setose, strongly ornamented with tubercles and serrated processes. Cervical groove deep and distinct. Epigastric and

  

postcervical regions each with pair of tuberculate processes. Frontal margin slightly oblique; antennal spine strong, lateral margins serrated. Anterolateral margin square, with small, blunt process directed anteriorly. Lateral margins subparallel, slightly wider posteriorly, with 3 spines (or processes) behind anterolateral spine and strongly crenulated, first lateral spine largest (excluding anterolateral spine). Posterior margin with 12 spines and intermediate serration. Rostrum triangular, horizontal, 0.3 times length of remaining carapace; dorsal surface moderately carinate, lateral margin with fine lateral serration along posterior half and posteriorly constricted, apex blunt, dorsal surface moderately carinate. Pterygostomian flap lateral surface granulate, anterior margin produced into a small spine.

*Sternum:* sternite 3 3.3–3.6 [3.3] times as broad as long; anterior margin bilobed and serrated, without distinct central notch; lateral margins rounded, anterolaterally produced to small tooth; surface slightly granulose. Sternite 4 2.1 times as wide as sternite 3; anterior margin broadly convex; anterior midline shallowly grooved; surface with rows of setae. Ridges demarcating sternites 4–7 with rows of setae; surfaces with submedian row of setae.

*Abdomen:* tergites covered with granules (posterior tergites pitted); tergites 2–4 with 2 elevated ridges separated by median transverse groove; tergites 2 and 3 with weak lateral and strong central blunt processes on anterior transverse ridges; tergites 4–6 unarmed, pitted and sparsely setose. Telson 1.4–1.7 [1.4] times as broad as long, composed of 8 plates; lateral margin with a row of plumose setae and small spines; uropodal endopods with short rows of spines on surface; lateral margins with row of spines and plumose setae.

*Eyes:* immobile, papillate and tuberculate mediodorsally, sparsely setose, with lateroventral eye spine. Cornea subglobular, with small spine between eye and antennal peduncle.

*Antennule:* distodorsal spine shorter than distolateral spine, distomesial spine small, with cristate row of several spines dorsolaterally; mesial margin crenulated; lateral margin sparsely dentate; surface granulate with scattered small spines.

*Antenna:* article 1 with long spine on distomesial margin (reaching end of article 2), distolateral margin produced to blunt tooth (surface of article 1 with scattered small spines); article 2 with blunt distomesial and distolateral tooth; article 3 with blunt mesial, lateral and dorsal processes distally.

*Maxilliped 3:* surface granulose; ischium with small distal spine on extensor margin and with distal spine on flexor margin, 18–21 [20–21] teeth on mesial ridge; merus, extensor margin with distal spine and with crenulate lateral margin, flexor margin with 3 strong teeth, proximal largest, and 1 small distal spine; carpus extensor margin with 3–4 teeth; propodus and dactylus unarmed.

*Pereopod 1 (cheliped):* elongate, sexually dimorphic, 2.0–1.9 (left) [2.0] and 1.6–1.9 (right) [1.9] times as long as carapace (including rostrum), surface setose, spinose, and tuberculate. Ischium with dorsal distal spine. Merus surface covered with setiferous

  

tubercles and 5 rows of spines or blunt processes, with 4 distal spines (2 of which blunt). Carpus surface spinose, with 3 longitudinal rows of spines, and 5 distal spines or blunt processes; carpus 0.3–0.4 [0.4] times as long as palm. Propodal palm sexually dimorphic, 2.7–3.7 [2.7–3.0] times as long as high, spinose and setose, with distinct row of spines on dorsal margin. Dactylus 0.5 times as long as propodus; opposable margins not gaping (slightly gaping in male right cheliped), occlusal margin denticulate.

*Pereopods 2–4:* surface slightly setose; P2 reaching anteriorly to proximal quarter of propodus of pereopod 1. Merus, dorsal margin with row of blunt spines and processes (from 8 [P2] to 3 [P4] spines including a blunt distal process); ventral margin with distal spine and row of tubercular processes; 1.3–0.8 [1.2–0.8] times as long as propodus (merus shortening from P2 to P4). Carpus, dorsal margin with tubercular processes, with 4 spines on dorsal crest (includes distal), with 1 blunt distal spine on ventral margin, with dorsolateral ridge of tubercles. Propodus 1.3–1.6 [1.5–1.6] times as long as dactylus; extensor margin crenulate (surface with scattered minute spines). Dactylus straight, flexor margin with inclined setae along the distal ¾, with 13–14 [13] inclined setae along flexor margin (excluding distal spine). Pereopods 2–4 decreasing in length (and spination) posteriorly.

*Epipods:* present on pereopods 1–3, absent from pereopod 4.

*Colour*

Label in original vial contains note on coloration as follows: ‘uniform orange, excluding pale barred legs’.

*Variation*

The female is slightly larger than the male but the overall proportions and spination are constant except for an apparent sexual dimorphism in the size of the chelipeds and their handedness. The right propodus of the male is more massive than the left (ratios length–width 2.7 [right] and 3.0 [left]) whereas the left propodus is more massive in the female specimen (3.7 [right] and 2.9 [left]) (Fig. 6). The left cheliped of the female is very similar to the right cheliped of the male though the right cheliped of the female is significantly reduced in size, despite being fully developed and undamaged.

*Remarks*

*Munidopsis papanui* n. sp. is distinguished by the spinose and tuberculate processes on the dorsal surfaces and appendages, the ocular peduncle with papillate mediodorsal processes peduncle and with ventral eye spine, the dorsolaterally cristate antennule and, most distinctly, the presence of the strong blunt median processes on abdominal tergites 2 and 3.

  

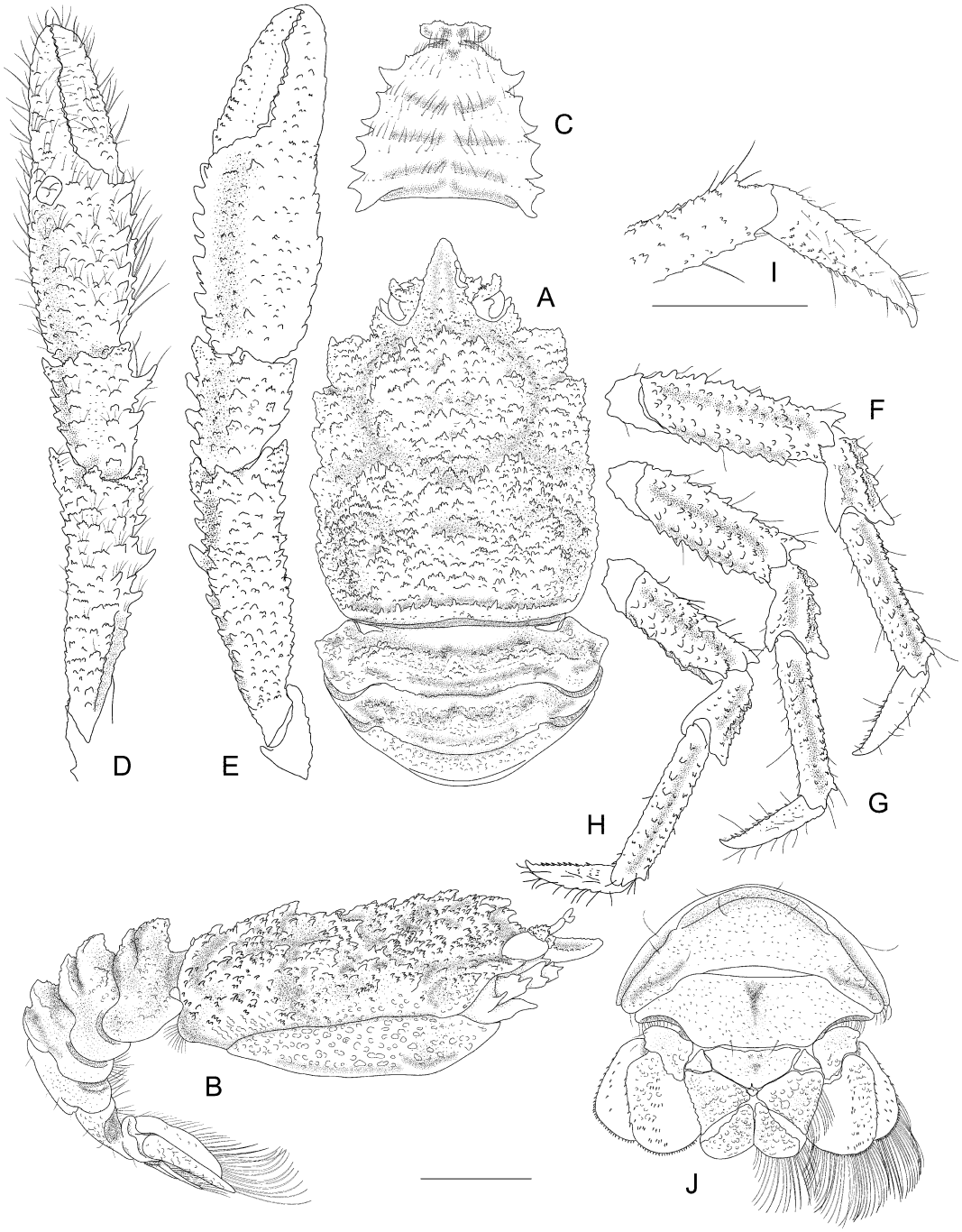


**FIGURE 4**. *Munidopsis papanui* n. sp., holotype, ♂, NMNZ CR. 10023. A, carapace and abdomen, dorsal; B, carapace and abdomen, lateral; C, sternal plastron; D, left cheliped, dorsal; E, right cheliped, dorsal, setae omitted; F–H, right pereopods 2–4, lateral; I, dactylus of right pereopod 2, lateral; J, posterior part of abdomen with uropods and telson. Scale: 2 mm (scale 1 for A–H and J; scale 2 for I).

  

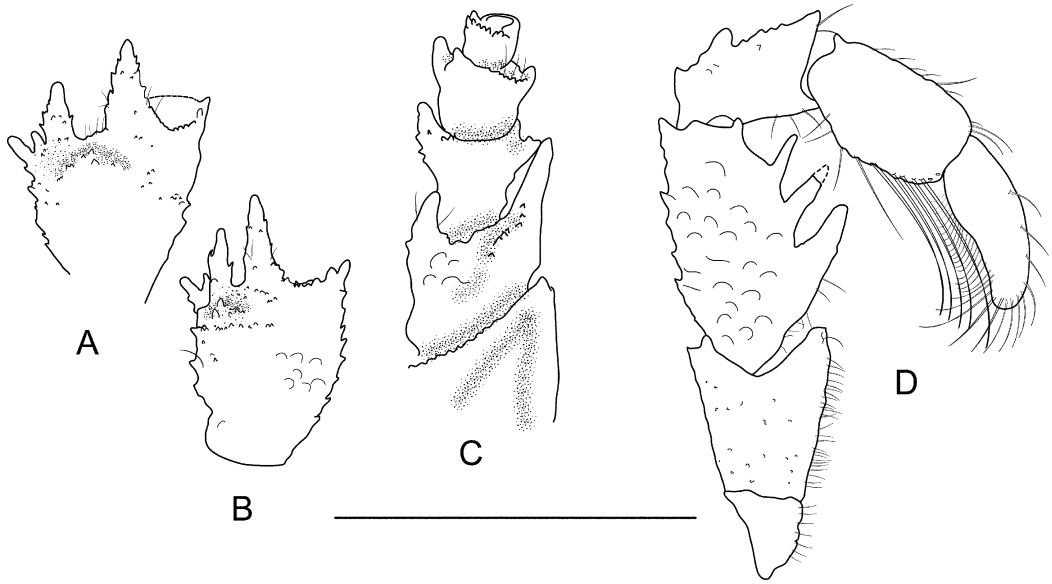


**FIGURE 5**. *Munidopsis papanui* n. sp., holotype, ♂, NMNZ CR. 10023: A, right antennule, ventral; B, right antennule, lateral; C, right antennal peduncle, ventral; D, right third maxilliped, lateral. Scale: 2 mm.

*Munidopsis papanui* n. sp. is most similar to the group of tuberculate species, comprising *M. proales* Ahyong & Poore, 2004, *M. tasmaniae* Ahyong & Poore, 2004, *M. sonne* Baba, 1995 and *M. taurulus* Ortmann, 1892 (redescription by Baba [2001]). However, *M. papanui* can easily be distinguished from all these by the strong blunt median process on the second and third abdominal tergites.

*Munidopsis papanui* is similar to *M. sonne* in that it shares the dorsally cristate antennule (absent in the other three species), but can be distinguished by the absence of papillate processes distally on the ocular peduncle and more distinctly spinose lateral margin of the carapace.

*Munidopsis proales* and *M. taurulus* have a much more slender cheliped compared to that of *M. papanui* but similarities with *M. taurulus* include the spinose posterior border of the carapace and the third antennal article with three spines. *Munidopsis proales* can further be distinguished from *M. papanui* by the smooth abdomen, the posterior margin of the carapace only with rugose squamae along the ridge, and by a pair of more pronounced epigastric spines.

*Munidopsis papanui* differs from *M. tasmaniae* most distinctly by the ornamented abdominal tergites, less pronounced epigastric processes and mesial row of spines on the palm of the cheliped.

The size of the two specimens of *M. papanui* is also smaller (maximum 8.1 mm) than *M. tasmaniae* (15.2–17.7 mm) and *M. sonne* (10.5–10.8 mm) but is comparable to that of *M. proales* (9.1 mm) and *M. taurulus* (7.3–11.7 mm).

  

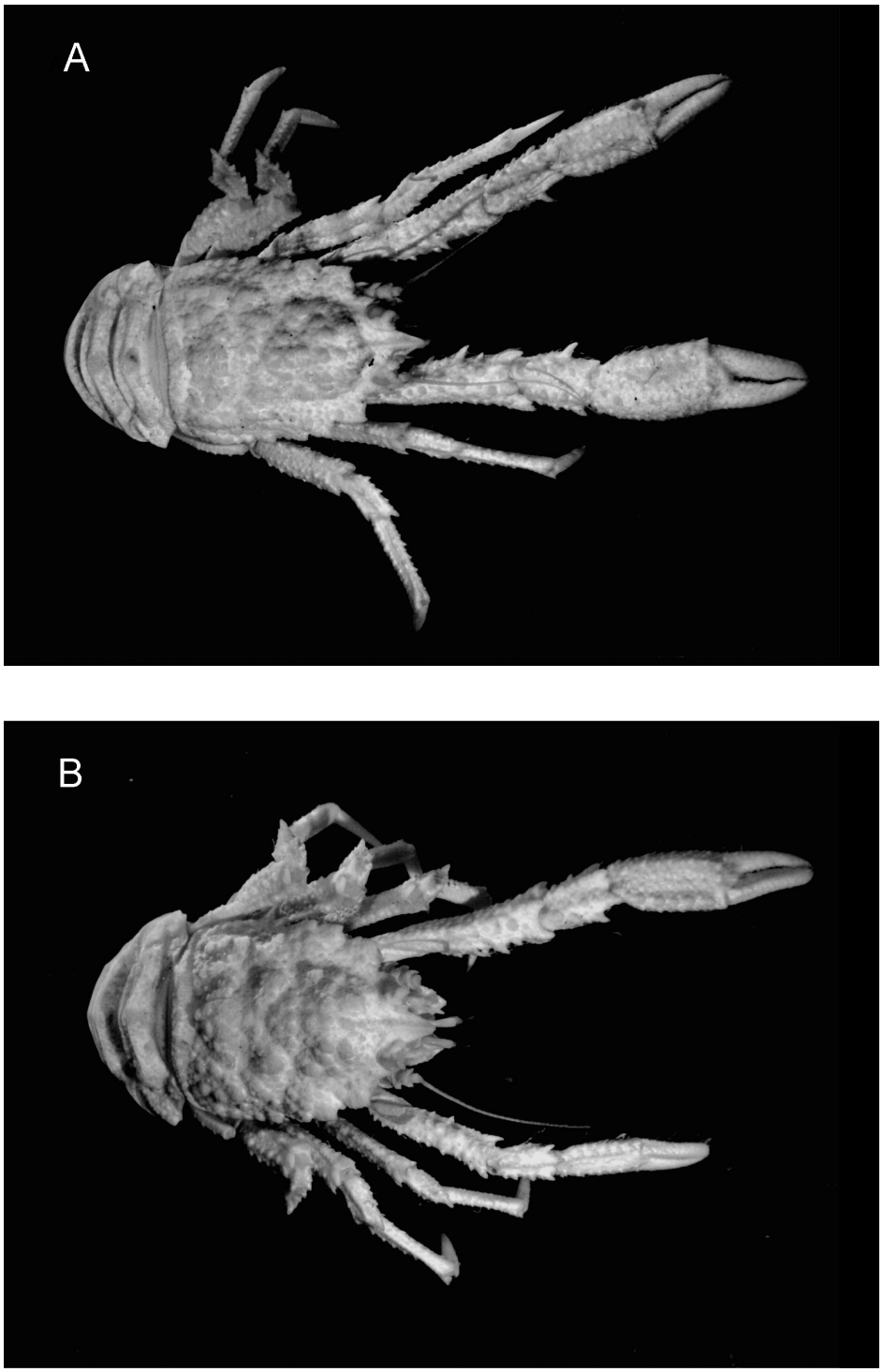


**FIGURE 6**. *Munidopsis papanui* n. sp., A, holotype, ♂, NMNZ CR. 10023, dorsal view. B, paratype, ♀ NIWA 21140, dorsal view.

  

Armed abdominal tergites are common in *Munidopsis*, with *M. taurulus* for example bearing a number of compressed spines on tergites 2 and 3. *Munidopsis curvirostra* Whiteaves, 1874, also known from the Lord Howe Ridge, has a single median spine on tergites 2 to 4 but these are smaller and more acute than those present in *M. papanui* n. sp. *Munidopsis papanui* and the North Atlantic species *M. parfaiti* (Filhol, 1885) share a more notable similarity in their dorsal abdominal armature with the latter bearing blunt median processes on abdominal segments 2 to 4 (only segments 2 and 3 in *M. papanui*, segment 4 bearing only two transverse ridges). *Munidopsis parfaiti* otherwise differs greatly from *M. papanui* in the shape and armature of the carapace and eyes and the abdominal spines are more acute (see Macpherson & Segonzac 2005).

The male holotype has two unidentified epizoids attached, one small circular growth on the propodus of the left cheliped and one elongate attachment to the apex of the right ocular peduncle (Fig. 4).

*Distribution*

Known only from the type locality, Papanui Canyon on the Otago shelf, southeastern coast of South Island, New Zealand (Fig. 1); depth of 420 metres.

*Etymology*

Named for the type locality. Papanui is also a Māori word for palm of a hand, alluding to the apparent sexual dimorphism and lateral asymmetry of the cheliped palm (noun in apposition).

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