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DESCRIPTION OF A NEW SPECIES OF THE PACIFIC SHRIMP GENUS *PARACRANGON* (CRUSTACEA: DECAPODA: CRANGONIDAE) FROM SOUTHERN AUSTRALIA, WITH A KEY TO THE GENUS

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Abstract

Hanamura, Y., Wadley, V. and Taylor, J., 1999. Description of a new species of the Pacific shrimp genus *Paracrangon* (Crustacea: Decapoda: Crangonidae) from southern Australia, with a key to the genus. *Memoirs of Museum Victoria* 57: 311–317.

A sixth species of the genus *Paracrangon, P. australis* sp. nov. (Crustacea: Decapoda: Crangonidae), is reported from a seamount off southern Australia and from Macquarie Island. The Australian species is unique in having four–five teeth on the dorsal median margin of the carapace, which is associated with a distinct reticulate structure on the supraventral part. All species of the genus recorded to date have four or fewer teeth on the dorsal median margin of the carapace. The present record is the first occurrence of the genus in the southwest Pacific and greatly extends its known geographical range. A key for identification of all species is presented with data on geographical and bathymetric ranges.

Introduction

The genus *Paracrangon* is a small group of crangonid shrimps unique in having no second pereopods. It currently contains five species in the Pacific Ocean, from Japan to off Peru, along the North Pacific subarctic waters (Méndez, 1981; Ohé and Takeda, 1986). Among the species, *P. echinata* Dana, 1852 is a trans-North Pacific species, occurring from the west coast of North America to Japan and the Tsushima Strait in the Sea of Japan, with a wide depth distribution from the sublittoral to over 1000 m. The remaining four species exhibit comparatively limited distributions. *Paracrangon abei* Kubo, 1937 and *P. furcata* Kubo, 1937 are endemic to Japan, while *P. areolata* Faxon, 1893 has been recorded in the eastern tropical Pacific from off Mexico to Peru.

In recent cruises (SS01/97, SS01/99) in southern Australia and Macquarie Island of FRV *Southern Surveyor* epibenthic sled surveys produced several shrimps including six specimens of the genus *Paracrangon.* These specimens differ from other species of *Paracrangon* in having four–five dorsal median teeth on the carapace, and undoubtedly belong to an undescribed species.

This paper reports on this sixth species of *Paracrangon* and provides evidence of an important extension of the known geographical range of the genus to the southwestern edge of the Pacific. The specimens are deposited in collections of the Tasmanian Museum and Art Gallery, Hobart (TM) and Museum Victoria, Melbourne (NMV).

Paracrangon australis sp. nov.

Figures 1–3

Material examined. Holotype. Tasmania, approximately 84 km SSE of South East Cape (44°16′S, 147°20′E), 987 m, epibenthic sled, FRV *Southern Surveyor*, 27 Jan 1997 (stn SS 01/97 36), TM G3656 (ovigerous female, 15.0 mm carapace length).

Paratypes. Tasmania, 84 km SSE off South East Cape (44°16.2′S, 147°19.8′E), "J1" seamount, 1300 m, epibenthic sled, T.N. Stranks et al. on FRV *Southern Surveyor*, 27 Jan 1997 (stn SS01/97 37), NMV J41279 (2 ovigerous females, c. 15, 15.7 mm carapace length).

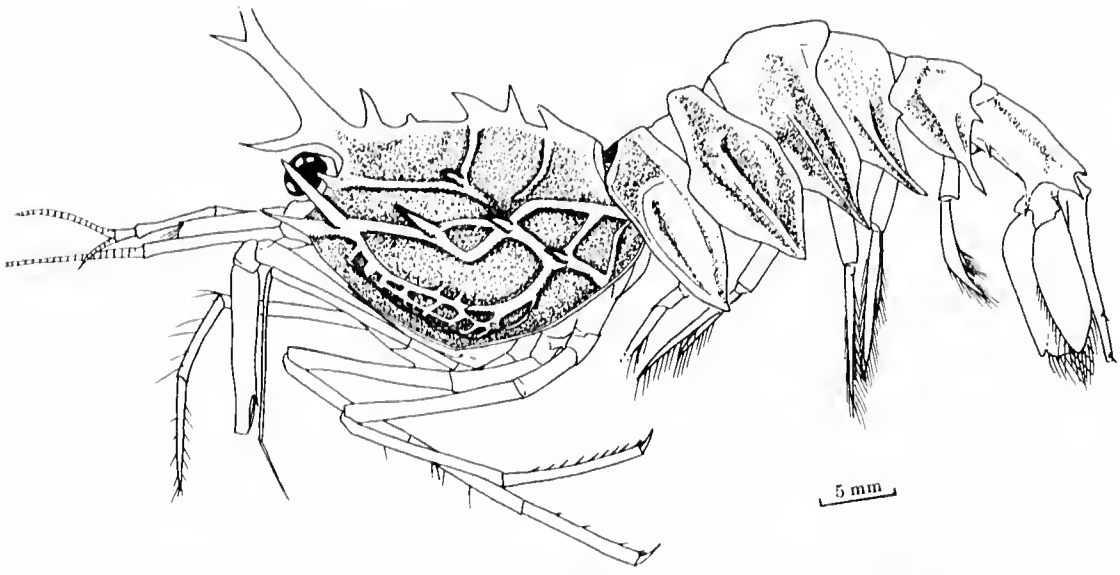

Figure 1. *Paracrangon australis* sp. nov., holotype ovigerous female (cl. 15.0 mm), lateral view.

Other material. Macquarie Island, North end of Gap (52°59.4′ 53°2.0′S, 159°59.0′ 159°58.2′E), 1422 m, Benthic Dredge, FRV *Southern Surveyor*, 31 Jan 1999 (stn SS01/99 130), TM G3756 (1 male 13.5 mm carapace length). Macquarie Island, Beer Garden (53°55.9′ 53°54.9′S, 159°5.9′ 159°2.2′E), 363.6 m, Benthic Dredge, FRV *Southern Surveyor*, 26 Jan 1999 (stn SS01/99 97), TM G4330 (1 male, 12.5 mm carapace length, 1 ovigerous female, 20.0 mm carapace length).

Diagnosis. Rostrum moderately long, directed obliquely upwards, armed ventrally with 2 teeth of normal shape, not furcate. Carapace with dorsal median margin bearing 5 teeth, and supraventral carina forming irregular reticulate structure.

Description of holotype. Rostrum nearly straight (broken off distally), extending obliquely upwards, dorsal margin smooth, without tooth or spine, ventral margin with strong tooth situated just anterior to cornea and slightly smaller tooth placed distally (Fig. 1).

Carapace with dorsal margin carinate for almost entire length, armed with 5 teeth, size varying considerably, first notably larger than second, third tooth robust and fourth tooth subequal to fifth; antennal tooth sharp, reaching midlength of cornea; pterygostomian tooth larger than antennal tooth; branchiostegal tooth set back from anterolateral margin of carapace, strong, flared anterolaterally; distinct carina supporting branchiostegal spine extending backwards to posterolateral margin (lateral carina), widely reticulated posteriorly; 2 teeth decreasing in size posteriorly arising along this carina; carina supporting antennal tooth extending to near midlength of carapace (dorsolateral carina), with small tooth at posterior end; relatively weak carina running between ventral margin and lateral carina (supraventral carina), connecting with lateral carina at both anterior and posterior ends, somewhat reticulate and small tooth present near posterior end; anterior vertical carina running ventrad from base of third dorsal tooth and meeting with dorsolateral carina; posterior vertical carina weak, running ventrad from base of fifth dorsal median tooth, slightly curving anteriorly near ventral end (Figs 1, 2a).

Abdomen with somite 1 rounded or weakly ridged dorsally, but not forming distinct carina; somites 2–5 sharply carinate dorsally, with highest carina on somite 3; somite 6 1.78 times as long as somite 5, 2 median dorsal carinae converging into posterior end, ventrolateral margin with small anterior tooth, and large, developed tooth posteroventrally, posterolateral margin ending in sharp tooth; ventral surface of somite 5 with posteriorly curving sharp, long process near posteromedian part and somite 6 with pair of anteriorly directed sharp processes at anterior end of ventral surface; pleura of somites 1–5 acutely produced ventrally, increasing in size towards posterior, accompanying median pleural carina supporting ventral spine or process, without additional tooth or spine on anterior margin (Figs 1, 2b). Telson broken off distally, but at least 2 pairs of dorsolateral spines present. Exopod of uropod shorter

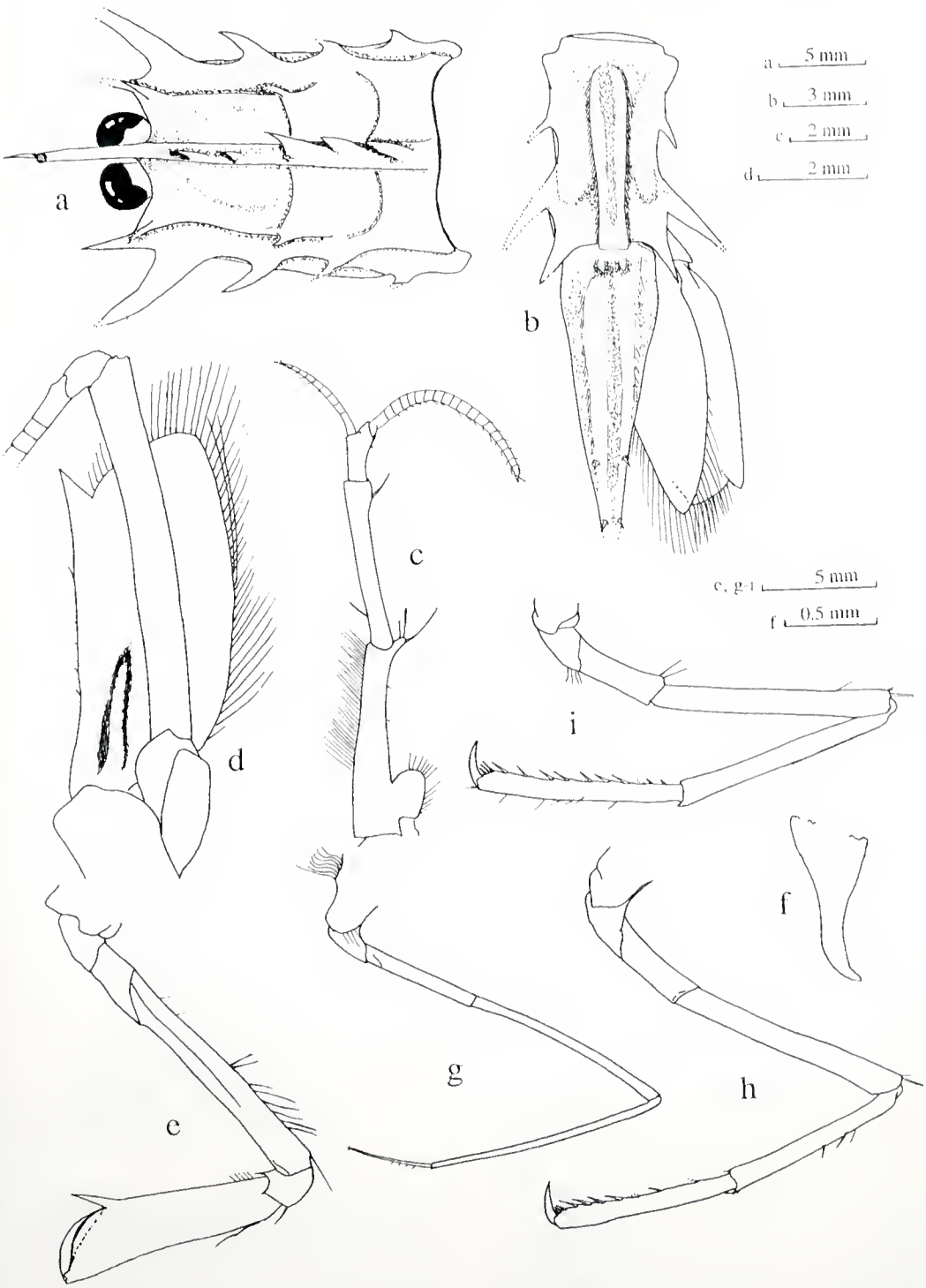

Figure 2. *Paracrangon australis* sp. nov., holotype ovigerous female (cl. 15.0 mm). a, carapace and eye, dorsal view. b, posterior part of body, dorsal view. c, antennule. d, antenna. e, pereopod 1. f, vestigial pereopod 2. g, pereopod 3. h, pereopod 4. i, pereopod 5.

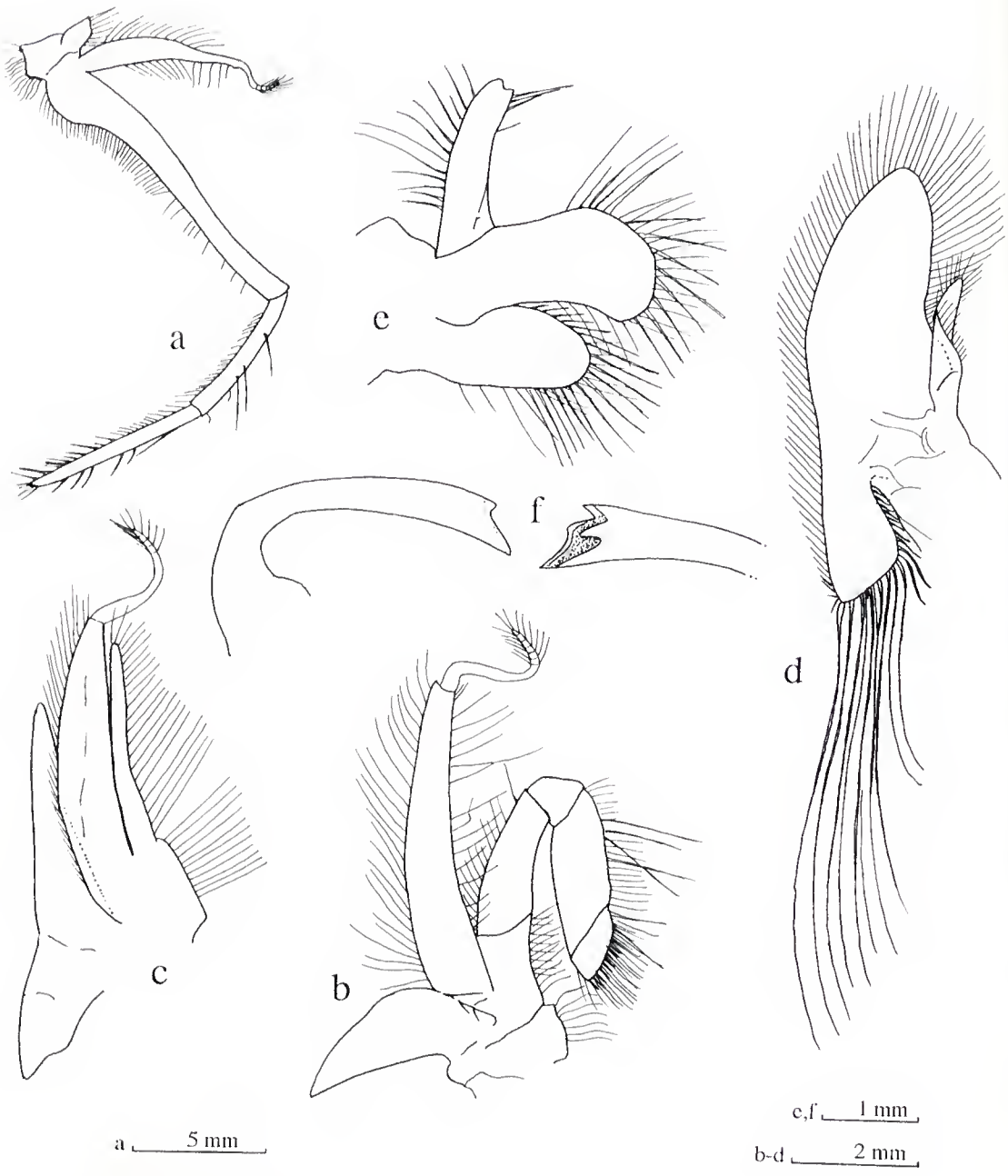

Figure 3. *Paracrangon australis* sp. nov., holotype ovigerous female (cl. 15.0 mm). a, maxilliped 3. b, maxilliped 2. c, maxilliped 1. d, maxilla 2. e, maxilla 1. f, mandible (dorsal view in right figure).

than endopod, with roundly produced distolateral lobe (Fig. 2b).

Eye with cornea well pigmented, slightly wider than eye-stalk (Fig. 2a).

Antennular peduncle relatively slender, with first segment 1.44 times as long as second, latter 2.81 times as long as third; upper flagellum short, composed of 19 articles, flattened towards distally, lower flagellum with 9 articles; styloccrite very short, distally rounded (Fig. 2c).

Antennal scale 0.53 times as long as carapace, 2.42 times as long as wide, distolateral spine falling short of end of lamella; carpocerite long, extending well beyond end of lamella (Fig. 2d).

Mouthparts as illustrated (Fig. 3b–f). Maxilliped 3 extending beyond end of antennular peduncle by length of whole distal segment, latter 1.36 times as long as penultimate (Fig. 3a).

Pereopod 1 subchelate, extending beyond end of antennular peduncle by length of distal third of propodus and dactylus, movable finger sharp, curving inward, fixed finger sharp (Fig. 2e). Pereopod 2 vestigial (Fig. 2f). Pereopod 3 slender, extending as far as end of pereopod 1, dactylus about third length of propodus, with long, sharp terminal seta (Fig. 2g). Pereopod 4 extending beyond end of antennular peduncle by about distal half length of propodus and dactylus; propodus with 8 long ventral spines; dactylus sharp, curving posteriorly, quarter–fifth length of propodus (Fig. 2h). Pereopod 5 extending beyond end of antennular peduncle by about distal third length of propodus and dactylus; propodus with 12–13 ventral spines, including 3 close-set distal spines; dactylus slightly less than fifth length of propodus (Fig. 2i).

Note on paratypes. The paratypes are more or less damaged in the carapace so the number of teeth on the dorsal median margin could not be counted accurately. The dorsal margin of abdominal somite 1 is more weakly ridged in the paratypes than in the holotype but not forming an acute carina as in following somites. Other external features including the carinal structure and ornamentation agree well with those of the holotype.

Colour in fresh condition. The background colour is basically light-red, with a slightly darker red on the rostrum and the posterior part of the abdomen.

Egg size. Non-eyed eggs are nearly spherical, moderately large, diameter 1.8—1.9 mm, and eyed eggs are oval, approximately 2.5 mm along longer axis.

Distribution. The type ovigerous females were collected from 987–1300 m depth approximately 84 km SSE off South East Cape, Tasmania. The more recently discovered material from Macquarie Island was at 363–1422 m. The characteristic red colour suggests this species to be a typical deepwater inhabitant.

Etymology. The specific name "*australis*" (= southern in Latin) indicates that the species is the southernmost inhabitant of the genus.

Remarks. Unlike the five described species of the genus *Paracrangon, P. australis* is unusual in possessing four–five dorsal median teeth on the carapace; all others have four or fewer. An irregularly reticulated structure of the supraventral part of the carapace noted in *P. australis* is similar to that in *P. areolata* and *P. okutanii*. This structure is not found in the remaining three species.

In addition to the carapace spine counts of the dorsal median margin, *P. australis* differs from *P. areolata* in having relatively shorter dactyli of the posterior two pereopods (fifth–sixth length of propodus vs third), and from *P. okutanii* by having proportionately shorter, obtuse ventral projections of the first two pleura, and the rostrum being directed more upward (50° vs 35°).

Although the disposition and number of teeth on the carapace display some intraspecific variations (Brashnikov, 1907; Hayashi, 1986), they have a specific pattern (Table 1). This may simply be due to lack of basic information about this feature partly reflecting the rarity of the species and future study may alter this table. In addition, an exact description of carinal structure of the carapace will be useful for definite identification of each species.

A microscopic chitinous lobe between the first and third pereopods is considered a second pereopod. Confirmation of this is needed in other species.

Discussion

Paracrangon is considered primarily a North Pacific genus with highest species richness in the waters around Japan, four of the five hitherto known species having been recorded there (Fig. 4). Prior to our finding, *Paracrangon areolata* was thought to be the only species to occur in the southern hemisphere.It occurs in the tropical eastern Pacific as far south as 17°S (Méndez, 1981; Hendrickx, 1995). The finding of a sixth species in southern Australian and Subantartic waters is a significant extension to the known geographical

Table 1. Disposition and number of teeth on carapace of species of *Paracrangon*

Species	dorsal median margin	dorsolateral part btween median and lateral carinae	lateral part mainly along lateral carina including branchiostegal and hepatic teeth	ventrolateral part between lateral carina and ventral margin
P. abei	3	2	4	0
P. areolata	4	2	4	0
P. australis	4–5	1	3	1
P. echinata	4	2–6	3–5	2
P. furcata	2–3	0	2	0
P. okutanii	4	1	3	1

range of the genus to 54°S. It is curious that the genus has not so far been found in the tropical western Pacific despite well organized intensive deepwater studies in the region over a hundred years.

Paracrangon is a well established crangonid genus and identification can be made using the following key. The key is modified from those provided by Kubo (1937) and Ohé and Takeda (1986), with a view to providing more conservative characters than the rostrum. The geographical and bathymetric ranges are included.

Key to species of *Paracrangon*

1. Supraventral carina of carapace forming distinct irregular reticulate structure 2
— Supraventral carina of carapace not forming distinct irregular reticulate structure 4
2. Dactyli of posterior 2 pereopods about third length of propodi..... *P. areolata* Faxon, 1893 (eastern tropical Pacific, from off Mexico to Peru; 650–1250 m)
— Dactyli of posterior 2 pereopods about fifth–sixth length of propodi..... 3
3. Rostrum shorter than carapace, obtuse ventral projection of first two pleura equal to or greater than depth of carapace ....*P. australis* sp. nov. (southern Australia, Macquarie Island; 360–1422 m)
— Rostrum longer than carapace; obtuse ventral projection of first two pleura shorter than depth of carapace..... *P. okutanii* Ohé and Takeda, 1986 (Central Pacific coasts of Japan; 425–1205 m)
4. Dorsal median margin of carapace with 4 teeth; all abdominal somites carinated dorsally ..... *P. echinata* Dana, 1852 (California to central Japan and Sea of Japan, throughout North Pacific boreal waters; sublittoral to 1380 m)
— Dorsal median margin of carapace with 2 or 3 teeth; abdominal somite 1 at least, rounded dorsally 5
5. First 2 median dorsal teeth of carapace denticulate distally; dorsal margin of carapace with 2 teeth and basal ventral spine simple, not furcate; abdominal somite 2 carinate dorsally ..... *P. abei* Kubo, 1937 (Japan, central to SW Pacific coasts, along Tushima Current in Sea of Japan; 150–300 m)
— Median dorsal teeth of carapace, simply tapering distally; dorsal margin of rostrum smooth and basal ventral spine furcate; abdominal somite 2 rounded dorsally..... .....*P. furcata* Kubo, 1937 (Japan, central to SW Pacific coasts; 320–400 m)

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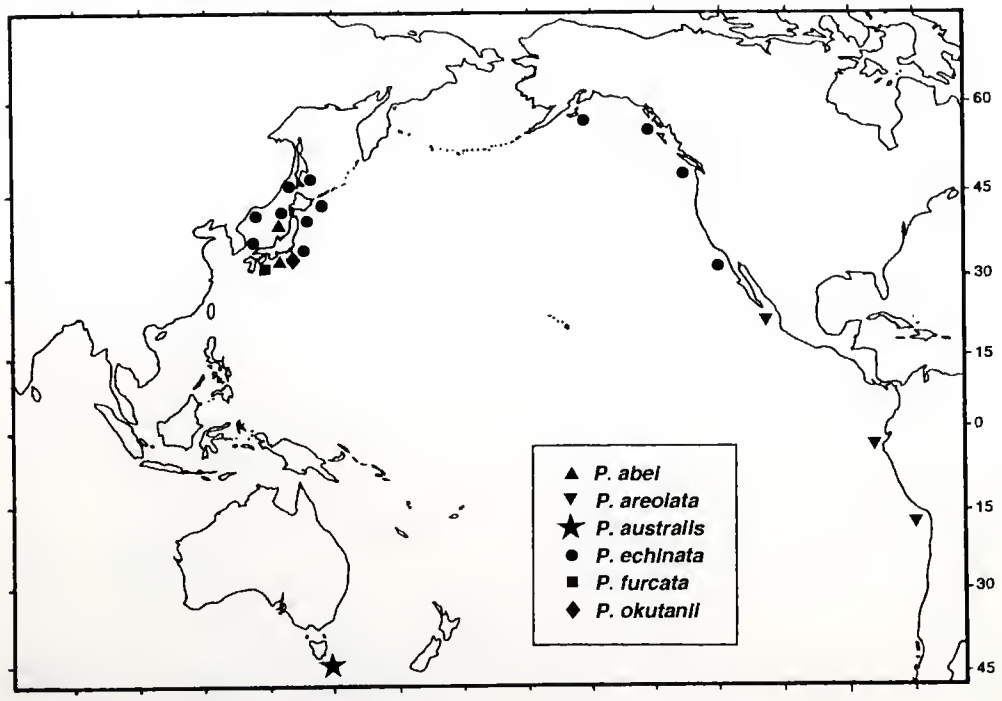

Figure 4. Distribution of species of *Paracrangon*.