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A New Species of *Paromola* (Crustacea, Decapoda,
Thelxiopidae) from New Zealand

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Abstract

A new species of *Paromola* is described and illustrated from a single adult male specimen taken in 50 fms. near Three Kings Islands. A key to the genus *Paromola* is provided. The new species is perhaps most closely related to the western Indian Ocean *P. profundarum* Alcock and Anderson. The affinities of one of the other two New Zealand thelxiopids, *Latreillopsis petterdi* Grant, are discussed.

INTRODUCTION

In January 1963 a small expedition from the University of Auckland Departments of Zoology and Botany, led by Mr Alan Baker, now of Victoria University of Wellington Zoology Department, visited the Three Kings Islands, some 36 miles north-west of Cape Maria Van Diemen. The purpose of the expedition was to investigate the flora and fauna of these islands and although most of the effort in the marine sphere was devoted to the intertidal zone, a few offshore stations were worked. One of these yielded a rather large crab which was forwarded to me by Mr Baker and Professor L. R. Richardson. The specimen proved to be a male of a new species belonging to the Family Thelxiopidae (= Homolidae). Up to the present time this family has been known to be represented in New Zealand by *Latreillopsis petterdi* Grant and *Latreillia australiensis* Henderson, species originally described from south-east Australia.

In this paper the new species is described and figured and a key is given to species of the genus *Paromola*, to which the new crab is referred. The terminology used for the most part follows that employed by Ihle (1913). In this family the rostral and orbital region appear, understandably, to provide some confusion to students of the group. At the front of the carapace is a central spine, termed the medial rostrum ("mediane Rostralzahn" of Ihle), which arises between the antennules. On either side of the rostrum and close to it are two spines which Ihle (1913, p. 55) terms the lateral rostral spines ("lateralen Rostralzahne"), and below these are some spines surrounding the orbit. In the new species there is a spine above the orbit and another below. These are termed respectively the supraorbital and infra-orbital spines. The carapace in crabs of this family bear more or less laterally a

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slender uncalcified line which is generally called the "linea homolica." In the description of the pleopods the abdominal surface is that lying against the abdomen and the sternal surface is that lying against the sternum.

Measurements were made with the aid of calipers and are expressed in millimetres. The measurement carapace length includes the length of the rostrum; the length of the chelipeds and ambulatory legs was measured along the ventral edge; all other measurements of parts of appendages were taken along the dorsal edge. Drawings were made with the aid of a graticule grid mounted in the ocular of the microscope, or by scale measurements.

SYSTEMATICS

Family THELXIOPIDAE Rathbun, 1937 (= HOMOLIDAE Henderson, 1888).

Genus PARAMOLA Wood Mason and Alcock, 1891.

Carapace decidedly macrurous in form; greatest width posteriorly, behind middle of carapace. Linea homolica conspicuous and well inside lateral border. Rostrum a simple cylindrical spine flanked on either side at base by a spine of equal or greater size. Antennae decidedly shorter than carapace, second segment seldom with a distal spine. Chelae of male generally elongate. Fourth pair of ambulatories seldom extending beyond tip of merus of preceding pair (Alcock, modified).

TYPE SPECIES: *Dorippe cuvieri* Risso, 1816, by monotypy.

This genus has previously been distinguished from *Thelxiope* Rafinesque (= *Homola* Leach) by the shape of the carapace and the form of the rostral spine (Alcock, 1889; Rathbun, 1937). If the presence or absence of a spine at the antero-external angle of the second antennal segment were to be emphasised the new species described here might be shifted to *Thelxiope*. However, the new species certainly appears to share a great many similarities with species at present included in *Paramola*.

Gordon has typified *Paramola* by the possession of 13-14 phyllobranchiate gills and 5-6 epipodites, and considers that *Latreilopsis petterdi* Grant, 1905, should be shifted to that genus. *L. petterdi* is not included in the key to species given here for reasons outlined in the discussion.

KEY TO SPECIES OF THE GENUS *Paramola*

- 1 (6) Lateral rostral spines with 1-2 accessory spinules on lateral or posterior surfaces.
- 2 (3) Lateral rostral spine with 2 small hooked spines on posterior surface. Carapace very weakly tuberculate *P. faxoni* (Schmitt, 1921). Pacific North America. (See Rathbun, 1937, p. 68, pls. 18, 19, fig. 1).
- 3 (2) Lateral rostral spine with a single accessory spinule. Carapace with numerous tubercles and spines.
- 4 (5) Carapace posterolaterally and posterodorsally bearing crowded subequal spinules. Merus and carpus of cheliped with spiniform tubercles, propodus tuberculate basally. Ambulatory merus 4 spinous dorsally and ventrally *P. japonica* Parisi, 1915. Japan, Hawaii. (See Sakai, 1936, p. 47, pl. III).

- 5 (4) Carapace posterolaterally and posterodorsally with several long spines and some smaller spinules. Merus of cheliped with a few spines dorsally, carpus and propodus smooth. Ambulatory merus 4 with a distal dorsal spine, otherwise smooth or with a few ventral spinules basally
- 6 (1) Lateral rostral spine lacking accessory spinules.
- 7 (10) Posterodorsal surface of carapace smooth, weakly tuberculate, or with scattered spinules. Ambulatory propodus 4 subtriangular, widest midway along.
- 8 (9) Medial rostral spine less than 1/6 post-rostral length of carapace. Posterolateral surfaces of carapace with a few spines. Chelae with longitudinal rows of spines
- 9 (8) Medial rostral spine more than 1/4 post-rostral length of carapace. Posterolateral surfaces of carapace smooth. Chelae smooth
- 10 (7) Posterodorsal surface of carapace strongly tuberculate. Ambulatory propodus 4 expanded at base.
- 11 (12) Terminal segment of eyestalk swollen at extremity. Chelipeds in adult male longer than ambulatories
- 12 (11) Terminal segment of eyestalk diminishing toward extremity. Chelipeds in adult male shorter than ambulatories.
- 13 (14) Second and third ambulatory legs densely spinose throughout their length. Supraorbital spines more slender than medial rostral spine and not much longer
- 14 (13) Second and third ambulatory legs weakly spinose basally, smooth distally. Supraorbital spines much stouter and longer than medial rostral spine
- P. alcocki* (Stebbing, 1920). South Africa, Maldive Archipelago. (See Gordon, 1950, p. 222, pl. I, fig. A.) (? = *P. majora* (Kubo, 1936). Japan, Hawaii—*vide* Gordon, 1950).
- P. spinimana* n.sp.
- P. profundarum* Alcock & Anderson, 1899. East Africa to India. (See Doflein, 1904, p. 16, pl. vii, figs 1-2).
- P. cuvieri* (Risso, 1816). North-east Atlantic, Mediterranean. (See Figueira, 1964, p. 69, pls. 1-2).
- P. rathbuni* Porter, 1908. Juan Fernandez. (See Rathbun, 1937, p. 69, pl. 19, fig. 2).
- P. machrochira* Sakai, 1961. Japan. (See Sakai, 1961, p. 146, pl. IV, fig. 5).

***Paromola spinimana* n.sp. (Figs. 1-8, pls. 1-2)**

HOLOTYPE: Male, carapace length 53, greatest carapace width (exclusive of spines) 41, cheliped length 190, chela height 17, cheliped dactyl length 33, first ambulatory leg length 160, fourth ambulatory leg length 70mm. Dominion Museum, Wellington (Cr. 1550).

TYPE LOCALITY: Off North East Island, Three Kings Islands, 50fms., January, 1963, A. Baker, Auckland University Three Kings Expedition.

Carapace urn-shaped, convex, longer than wide, greatest width just behind middle, posteriorly very slightly narrowed; anterior and lateral surfaces armed with coarse, conical sharply pointed spines, longest anteriorly; dorsum granular posteromedially, surface elsewhere smooth except for spines. Regions well defined posteriorly, linea homolica and cervical groove for the most part prominent, cervical pits deep. All legs including chelipeds very long (chelipeds almost 4 times carapace length, first ambulatory leg about 3 times carapace length, legs 2 and 3 slightly shorter, 4th ambulatory leg less than $\frac{1}{2}$ length of first), chelipeds moderately stout, ambulatories slender; chelipeds and ambulatory meri coarsely spinose. Carapace and legs with short fine hairs, a few longer hairs on ambulatories.

Medial rostral spine acuminate, simple, dorsally weakly concave with a longitudinal groove basally. Lateral rostral, supraorbital and infraorbital spines as long as medial rostral spine.

Protogastric regions each with five spines, two short ones submedially in a line behind lateral rostral spines, the second the longer, a spine as long as rostral spines centrally and two spines as long as submedial ones near cervical groove, one at posterolateral corner and a shorter one behind central spine. Metagastric region posteriorly with two submedial spinules and two similar spinules medially just in front of these. Urogastic regions with a pair of widely spaced spinules. Intestinal region with a single small medial spinule. Branchial regions with a short dorsal spine anteriorly close to junction of linea homolica and cervical groove and a group of 3-4 spinules just medial to linea homolica posteriorly. Junction of lateral and dorsal surfaces of carapace with a row of six spines subdorsally just outside linea homolica, one subdorsal spine on hepatic region with two or three slightly longer spines below; second spine, the longest of the carapace spines (up to twice length of other subdorsal spines), on region between branchial and cervical grooves, with or without an accessory spine on posterior border near base; a small spine below this; third spine, the first of branchial spines, with four spines below following branchial groove and one on anteroventral extension of branchial region almost opposite anterolateral corner of mouthfield. Lateral wall of branchial region with a poorly defined group of 6-10 spinules and a few others scattered about.

Antennules bulbous basally, two subterminal segments long and slender, terminal flagellum short. Antennae moderately long, about $\frac{1}{2}$ carapace length, slender, second segment with a short lateral spine distally, antennae otherwise unarmed.

Eyestalks with slender basal segment little longer than bulbous terminal segment, the latter weakly constricted midway along. Cornea large, circular.

Third maxillipeds subpediform, weakly flattened and widest at junction of ischium and merus, hairy and spinous. Ischium with 7-8 small spinules irregularly placed along inner edge; lateral edge with three spines equidistantly along distal half, the first a small spinule midway along, the last the longest on distal edge itself; distal edge with three further subequal spines, two towards inner edge and one on distal inner edge. Merus weakly curved, subcylindrical, narrow distally, two long spines midway along on lateral edge and two equally long divergent spines close together distally; seven generally smaller spines towards inner edge in a line curving slightly laterally towards distal edge, second from base about one half size of lateral and distal spines, remainder about one third length of second; a small spinule at base on inner edge. Palp subcylindrical, carpus and dactyl unarmed, propodus with 3 long equidistant subequal spines laterally; dactyl long, hardly tapering, bluntly pointed.

Chelipeds with ischium and merus subtriangular, bearing long spines in three ill-defined rows, dorsally, anteroventrally and posteroventrally, anteroventral comprising two adjacent rows. Carpus with several rows of scattered tubercles and spinules and about 3 very long spines midway along medial surface. Palm weakly compressed, enlarged distally, with straight edges, a dorsal and ventral row of long spines directed medially (inwards); a row of tubercles on middle of inner surface, two adjacent rows along middle of outer surface and one dorsally and one ventrally, parallel to rows of spines. Fingers carinate on inner edges, inwardly curved and ending in a sharp "hook".

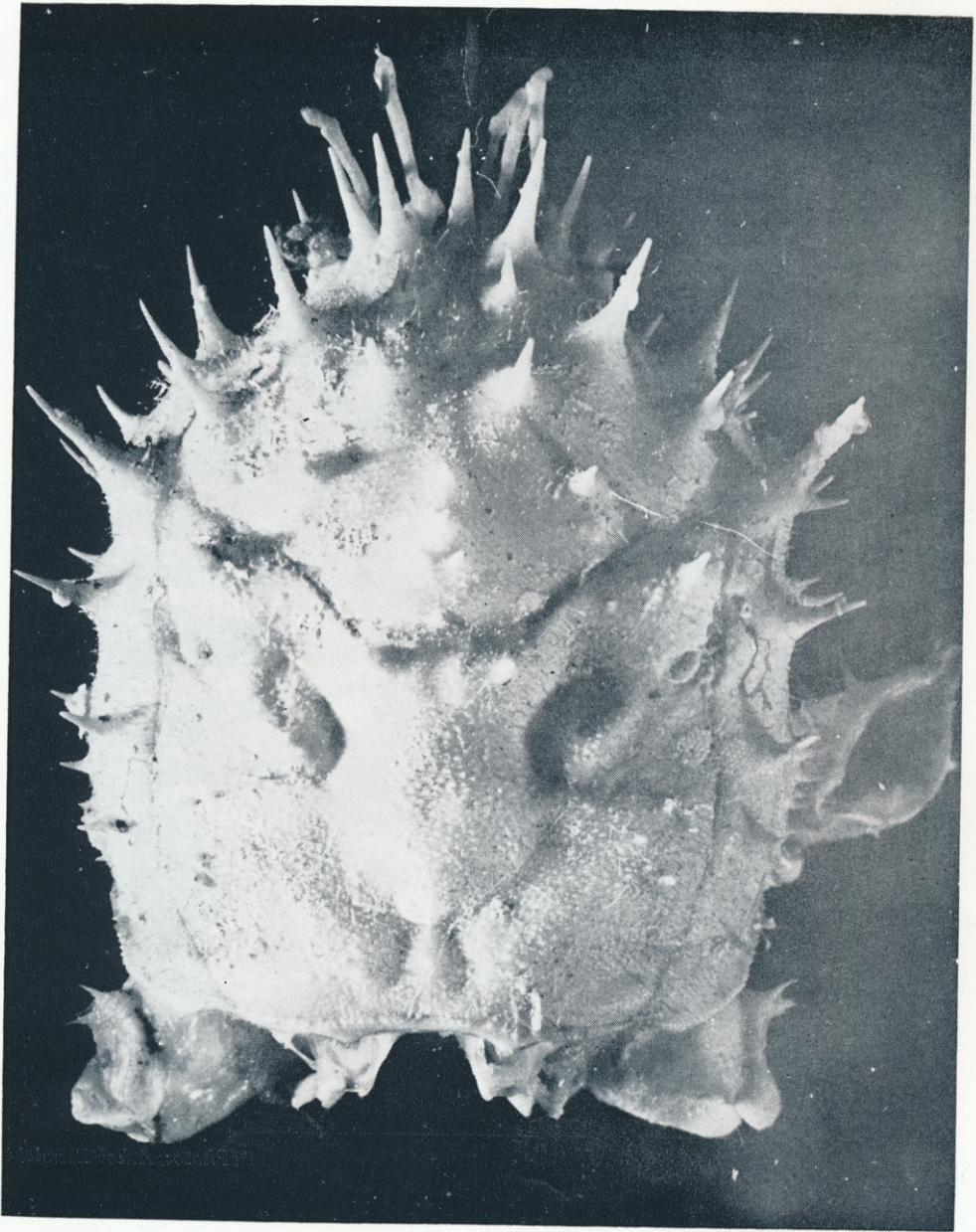
Ambulatories compressed. Meri with a row of scattered, moderately long spines along dorsal and ventral edges and a weak terminal spine dorsally. Dactyli of ambulatories 1-3 long and weakly tapering, with spinules along ventral edge, up to 3 spinules on ventral edge of propodi distally. Fourth ambulatories, as usual, shorter than preceding (reaching almost to tip of carpus of third leg), propodus strongly compressed, slightly expanded midway along ventral edge and armed along distal portion with five pairs of blunt spines, diminishing distally, in a double row. Dactyl subchelate, subcylindrical, terminating in a blunt spine.

Abdomen of 7 distinct segments, subovate, narrow, widest at middle of segment 5, each segment except last wider than long with slightly sinuous margins, lateral margin of sixth segment bilobate. Seventh segment longer than broad, tapering distally, abruptly narrowed into a blunt, subtriangular tip; surface with 3 grooves, a medial one in distal half and a lateral one in basal half. A broad low central ridge extending from segments 2-6 inclusive, segments 2 and 6 with a sharp spine centrally, segment 6 with an additional similar spine towards lateral edge distally. Surface with scattered hairs, mostly in ill-defined groups.



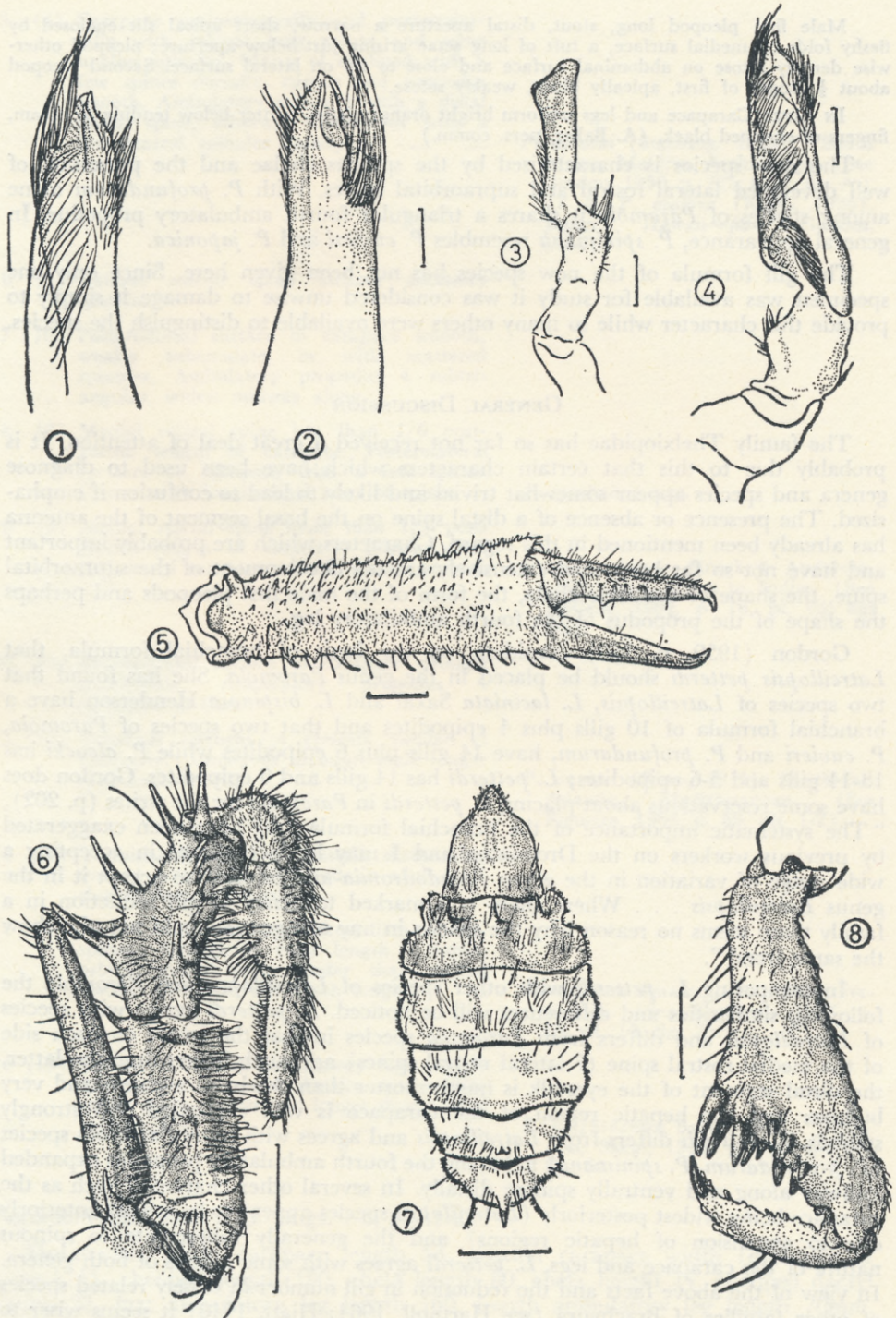
(Photo: Athol Beswick)

Paromola spinimana, n.sp. Holotype male in dorsal view.



(Photo: Athol Beswick)

Paromola spinimana, n.sp. Holotype male, carapace in dorsal view.



TEXT-FIGS. 1-8.—*Paromola spinimana* n.sp. Holotype male. 1, 2: male left first pleopod, tip. 1, abdominal aspect; 2, sternal aspect; 3, male left second pleopod, abdominal aspect; 4, male left first pleopod, abdominal aspect; 5, right chela; 6, right third maxilliped; 7, male abdomen; 8, right fourth ambulatory propodus and dactyl. Scale line in figs. 1-4 and 8 represents 2mm, in remaining figs. 10mm.

Male first pleopod long, stout, distal aperture a narrow, short apical slit enclosed by fleshy folds on medial surface, a tuft of long setae arising just below aperture; pleopod otherwise densely setose on abdominal surface and close to tip on lateral surface. Second pleopod about $\frac{1}{2}$ length of first, apically blunt, weakly setose.

IN LIFE: Carapace and legs uniform bright orange above, lighter below tending to cream, fingers of cheliped black. (A. Baker, pers. comm.)

The new species is characterised by the spinous chelae and the possession of well developed lateral rostral and supraorbital spines. With *P. profundarum* alone among species of *Paromola* it shares a triangular fourth ambulatory propodus. In general appearance, *P. spinimana* resembles *P. cuvieri* and *P. japonica*.

The gill formula of the new species has not been given here. Since only one specimen was available for study it was considered unwise to damage it simply to provide this character while so many others were available to distinguish the species.

GENERAL DISCUSSION

The family Thelxiopidae has so far not received a great deal of attention. It is probably due to this that certain characters which have been used to diagnose genera and species appear somewhat trivial and likely to lead to confusion if emphasized. The presence or absence of a distal spine on the basal segment of the antenna has already been mentioned in this regard. Characters which are probably important and have not so far been used extensively are the development of the supraorbital spine, the shape of the male chela, the form of the male first pleopods and perhaps the shape of the propodus of the fourth ambulatory leg.

Gordon (1950, p. 220) considers, on the basis of branchial formula, that *Latreillopsis petterdi* should be placed in the genus *Paromola*. She has found that two species of *Latreillopsis*, *L. laciniata* Sakai and *L. bispinosa* Henderson have a branchial formula of 10 gills plus 4 epipodites and that two species of *Paromola*, *P. cuvieri* and *P. profundarum*, have 14 gills plus 6 epipodites while *P. alcocki* has 13-14 gills and 5-6 epipodites; *L. petterdi* has 14 gills and 6 epipodites. Gordon does have some reservations about placing *L. petterdi* in *Paromola* for she writes (p. 202), "The systematic importance of the branchial formula may have been exaggerated by previous workers on the Dromiacea and I may be inconsistent in accepting a wide range of variation in the genus *Pseudodromia* and refusing to accept it in the genus *Latreillopsis* . . . Where there is a marked tendency to gill reduction in a family there seems no reason why the species in any one genus should not also show the same trend".

In comparing *L. petterdi* with other species of *Latreillopsis* and *Paromola* the following similarities and differences will be noticed. *L. petterdi* agrees with species of *Latreillopsis* and differs from *Paromola* species in that the spines on each side of the medial rostral spine (? lateral rostral spines) are much longer than the latter, the distal segment of the eyestalk is much shorter than the basal segment and very bulbous and the hepatic region of the carapace is well expanded and strongly spinous. *L. petterdi* differs from *Latreillopsis* and agrees with some *Paromola* species (*P. profundarum*, *P. spinimana*) in having the fourth ambulatory propodus expanded midway along and ventrally spinose distally. In several other characters such as the carapace being widest posteriorly (*Latreillopsis* species appear to be widest anteriorly due to expansion of hepatic regions) and the generally tuberculate to spinous nature of the carapace and legs, *L. petterdi* agrees with some species of both genera. In view of the above facts and the reduction in gill number in closely related species of other families of Brachyura (see Hartnoll, 1964; Hiatt, 1948) it seems wiser to leave a decision on the systematic position of *L. petterdi* to the context of a general revision of the Thelxiopidae, or at least until characters likely to be of value in the taxonomy of these crabs have been investigated more fully.

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LITERATURE CITED

- ALCOCK, A., 1899. Materials for a carcinological fauna of India. No. 5. The Brachyura primigenia or Dromiacea. *J. Asiat. Soc. Beng.* 68: 123-169.
- BALSS, H., 1957. Abteilung Brachyura, Borradaile, 1907. In H. G. Bronns' *Klassen und Ordnungen des Tierreichs* 5 (1) 7, Decapoda 12: 1505-1672, figs. 1131-1199.
- BENNETT, E. W., 1964. The Marine Fauna of New Zealand: Crustacea Brachyura. *N.Z. Dep. sci. industr. Res. Bull.* 153: 120 pp., 141 figs.
- DOFLEIN, F., 1904. Brachyura. In "Wissenschaftliche ergebnisse der Deutschen Tiefsee-Expedition auf dem dampfer "Valdivia" 1898-1899." 6: xiv, 314 pp., 68 text-figs., 58 pls. Fischer, Jena.
- EDMONDSON, C. H., 1951. Some Central Pacific Crustaceans. *Occ. Pap. Bishop Mus.* 20 (13): 183-243, figs. 1-38.
- FIGUEIRA, A. J. G., 1964. A new record of *Paromola cuvieri* (Risso) from the Azores. (Crustacea, Decapoda, Thelxiopidae). *Açoreana* 6 (1): 69-71, pls. I, II.
- GORDON, I., 1950. Crustacea Dromiacea. I. Systematic Account of the Dromiacea collected by the "John Murray" Expedition. II. The Morphology of the Spermatheca in certain Brachyura. *Sci. Rep. "John Murray" Exped. 1933-34* 9: 201-253, text-figs. 1-26, pl. I.
- GRANT, F. E., 1905. Crustacea dredged off Port Jackson in Deep Water. *Proc. Linn. Soc. N.S.W.* 30 (2): 312-324, pls. X, XI.
- HARTNOLL, R. G., 1964. Reduction of the gill number in Spider Crabs. *Crustaceana* 7 (2): 145-148.
- HIATT, R. W., 1948. The Biology of the Lined Shore Crab, *Pachygrapsus crassipes* Randall. *Pacif. Sci.* 2 (3): 135-213, 12 tables, 18 figs., pls. I, II.
- IHLE, J. E. W., 1913. Die Decapoda Brachyura der Siboga Expedition. I. Dromiacea. *Siboga Exped. Monogr.* 39b (71): 1-96, figs. 1-38, 4 pls.
- RATHBUN, M. J., 1937. The Oxystomatous and Allied Crabs of America. *Bull. U.S. nat. Mus.* 166: 278 pp., 47 figs., 86 pls.
- SAKAI, T., 1936. Studies on the Crabs of Japan. I. Dromiacea. *Sci. Rep. Tokyo Bunrika Daig.* (B) 3, Suppl. 1: 1-66, figs. 1-13, pls. 1-9.
- 1961. New species of Japanese crabs from the collection of His Majesty the Emperor of Japan. *Crustaceana* 3(2): 131-150, figs. 1-4, pls. III, IV.

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