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PRELIMINARY DESCRIPTIONS OF A NEW GENUS AND TWELVE NEW SPECIES OF NATANT DECAPOD CRUSTACEA FROM NEW ZEALAND

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A STUDY of New Zealand decapod shrimps and prawns under Professor L. R. Richardson at Victoria University of Wellington during 1953-1959 resulted in the production of two theses containing a number of new and named taxa from this area. Immediate publication of these new names was impossible owing to the constant inflow of fresh material during that period. This additional material made it necessary to delay individual publication until a full study of the whole natant decapod fauna of the area was completed. Since 1959 other commitments and other research have repeatedly delayed the planned completion of a full systematic and illustrated account of the New Zealand natant decapod Crustacea. Continued and increasing interest in the shrimps and prawns of this area, especially from the point of view of possible commercial exploitation, has made it advisable to publish without further delay preliminary descriptions of a new genus and twelve new species of New Zealand natants.

The majority of these new species were reviewed and systematically listed, but not named, in Richardson and Yaldwyn (1958), and references to that "Guide" and its key figures are given below where appropriate. The existence of a published guide to New Zealand natant decapods, with references to 19 new or unnamed species, and the availability of library copies of the two theses with their unpublished new names, has led to considerable confusion and the consequent danger of systematically unavailable names being published in technical or ecological reports. The following preliminary descriptions will make the majority of these manuscript names systematically available.

Four of the unnamed species in the 1958 guide were described by Yaldwyn (1960) and a further eleven are described here. Three new pontoniine palaemonids (Richardson & Yaldwyn, 1958: 34) are at present being described elsewhere by A. J. Bruce and the author. Since 1958 one species in the guide (*Periclimenes batei* Holthuis) has been renamed *Periclimenes yaldwyni* Holthuis, 1959, another (*Pontophilus* n.sp. Richardson & Yaldwyn, 1958: 41, fig. 49) has been described as *Pontophilus yaldwyni* Zarenkov, 1968 and a new genus and species from deep water off the east coast of the South Island has been described as *Bathyhippolyte yaldwyni* Hayashi & Miyake, 1970.

Order DECAPODA
Suborder NATANTIA
Section CARIDEA
Family PASIPHAEIDAE

Genus *Pasiphaea* Savigny, 1816

Pasiphaea notosivado n.sp.

Pasiphaea aff. *P. sivado* (Risso), Richardson & Yaldwyn, 1958: 29, fig. 11.

Rostrum not extending as far anteriorly as anterior margin of carapace. Carapace, but not abdomen, dorsally carinate and bearing a branchiostegal spine which does not project beyond anterolateral margin. No spines on abdominal segments; telson distally truncate. Merus of 1st pereopod armed with 2-3 spines, merus of 2nd with 6-8 spines. Colour in life transparent with irregularly scattered red chromatophores. Very close to the Northern Hemisphere *P. sivado* (Risso) but differing in the distinct carination of anterior half of carapace, the placement of the branchiostegal spine and in the absence of a posterodorsal spine on 6th abdominal segment.

Type material: Holotype, male, carapace length 20mm, from Victoria University Stn VUZ 13, Cook Strait midwater collection, 41°32'S, 174°56'E, 5 February 1955, 2 metre cone net at 50 to 100 fms over 400 fms (Dom. Mus. Z. Cr. 1869). Numerous paratypes from other Cook Strait midwater collections.

Pasiphaea barnardi n.sp.

Phye pacificus Barnard, 1950: 651, fig. 122e (NOT *Pasiphaea pacifica* Rathbun, 1904: 20, fig. 2).

Pasiphaea aff. *P. pacifica* Rathbun, Richardson & Yaldwyn, 1958: 29, fig. 12.

Rostrum not extending as far as, or extending slightly beyond, anterior margin of carapace. Carapace and 2nd to 6th abdominal segments dorsally carinate; branchiostegal spine arising near anterolateral margin and extending beyond it; branchiostegal sinus (concave notch in anterolateral margin below and a little behind branchiostegal spine) distinct. No spines on abdominal segments; telson with deep distal notch. Merus of 1st pereopod armed with 1-3 spines, merus of 2nd with 12-13 spines, basis of 2nd unarmed except for distal projection. Colour in life uniform scarlet. Close to the northern Pacific *P. pacifica* Rathbun but differing (as does Barnard's South African material identified as *P. "pacificus"*) in the placement of the branchiostegal spine.

Type material: Holotype, male, carapace length 26.5mm, from Victoria University Stn VUZ 82, Cook Strait midwater collection, 41°42.5'S, 175°9'E, 17 February 1957, beam trawl at c.500 fms over c.550 fms (Dom. Mus. Z. Cr. 1870). Paratypes from southern New Zealand mid-water collections.

Family RHYNCHOCINETIDAE

Genus *Rhynchocinetes* H. Milne Edwards, 1837

Rhynchocinetes ikatere n.sp.

Rhynchocinetes n.sp. Richardson & Yaldwyn, 1958: 29, fig. 25.

Rostrum with 5-6 dorsal teeth, 3-4 near apex, and 10-11 ventral teeth; articulation with carapace complete. Carapace with 2 postrostral teeth, antennal and pterygostomial spines present, but supraorbital reduced to blunt nodule; no angular projection bounding orbit above antennal spine. Abdomen strongly humped at 3rd segment, no lateral sutures on 1st to 3rd segments, no teeth posterolaterally on 4th and 5th segments. Integument finely striate. Arthrobranchs present on 1st and 2nd pereopods only. Distinctive colour pattern in life of symmetrically placed white bands on light red carapace and abdomen. Differs from other species of *Rhynchocinetes* by possessing in combination, two teeth on carapace behind rostral articulation, no supraorbital spine and no angular projection bounding the orbit above the antennal spine.

Type material: Holotype, female, carapace length 11mm, from Northern Prawn Investigation Stn 8, off Mayor Island, Bay of Plenty, 37°15'S, 176°12'E, 19 August 1956, Australian prawn trawl on bottom of sand and rock, 80-120 fms, m.v. *Ikatere* (Dom. Mus. Z. Cr. 1871). A paratype female taken at same station.

This species is named after the New Zealand Marine Department Fisheries Branch research trawler m.v. *Ikatere* (Captain W. Sampson) used by the author for commercial prawn investigations in the Bay of Plenty during August 1956.

Family ALPHEIDAE

Genus *Alpheopsis* Coutière, 1897

Alpheopsis garricki n.sp.

Alpheopsis sp. Richardson & Yaldwyn, 1958: 36 footnote.

Rostrum short, acute, reaching about two-thirds the distance to distal margin of first segment of antennular peduncle. Supra-orbital spines broad-based but acute, extending anteriorly more than half length of rostrum. Stylocerite slender, acute, extending anteriorly almost as far as distal margin of second segment of antennular peduncle. 1st pereopods subequal in size but differing in form and specialisation of fingers; single alpheopsid groove and short transverse groove on chela. Pereiopod dactyls simple; 2nd pereopod with 5 carpal subsegments. No arthrobranchs on maxillipeds or pereopods; epipods on 1st to 4th pereopods. Colour in life transparent with 8 broad, transverse, red bands on carapace and abdomen. Probably close to the inadequately known *A. trispinosus* (Stimpson) from Australia but appears to differ in relative lengths of rostrum and supraorbital spines, and in form of chela palm and fingers.

Type material: Holotype, male, carapace length 4mm, from Victoria University Stn VUZ 4, off Rangitoto Is, Cook Strait, 40°44'S, 174°O'E, 18 December 1954, beam trawl on coarse bryozoan, shell and stone bottom, 40-50 fms (Dom. Mus. Z. Cr. 1872). Paratypes from off Wanganui, Cook Strait and Chatham Island areas, 20-110 fms.

This species is named after Dr J. A. F. Garrick, Associate Professor of Zoology at Victoria University of Wellington, who first recognized and drew my attention to its distinctive colour markings.

***Betaeopsis* n.gen.**

Similar to *Betaeus* Dana, 1852 (see Barnard, 1950: 733), differing mainly in having no movable articulation between pleura of 6th abdominal segment and segment proper. Anterodorsal margin of carapace distinctly emarginate in midline; inner margins of orbital hoods in dorsal view extend posteriorly to delimit a deep groove in midline between the eyes (the form of this distinctive groove in *B. aequimanus* is discussed in detail by Coutière, 1899: 65-68, figs 9-11, 13). 1st pereopods subequal, never greatly enlarged, smooth (i.e. not granulated or tuberculated) and twisted so that free finger of chela is ventral. Epipods on maxillipeds and 1st to 2nd pereopods only.

Type species: *Betaeus aequimanus* Dana, 1852, an intertidal and shallow water New Zealand species (see Richardson & Yaldwyn, 1958: 37, fig. 36).

The only other species of this genus known is *Betaeopsis* (previously *Betaeus*) *indicus* (de Man, 1910) from Indonesian waters.

***Alpheus* Fabricius, 1798**

***Alpheus richardsoni* n.sp.**

Crangon novae-zealandiae Powell, 1947: 35, fig. 173 (NOT *Alpheus novaezealandiae* Miers, 1876—see Yaldwyn, 1956: 805-811, figs. 1-7). *Alpheus* sp. *Edwardsi* group Richardson & Yaldwyn, 1958: 37, fig. 35.

A member of the *Edwardsi* group with rostrum short, acute, reaching to distal end of proximal segment of antennular peduncle. A weak mid-dorsal carina extends from rostrum to fade out a little posterior to base of orbital hoods. Scaphocerite, reaching a little beyond antennular peduncle, about three times as long as broad; outer margin weakly concave and terminating distally in a strong spine which distinctly overreaches distal edge of lamella. 1st pereopod large chela swollen, a little more than 1.5 times as long as carapace and reaching with about half palm beyond scaphocerite; fingers about half as long as palm, free finger compressed and having outer margin evenly convex, fixed finger swollen on inner surface and partly concealing free; palm somewhat compressed, two-thirds as long as wide, both upper and lower margins emarginate, upper portion of both inner and outer surfaces with triangular depressions, that on inner surface having characteristic W-shaped lower margin. 1st pereopod small chela in male "*Balaeniceps*"-like, subequal in length to carapace and reaching with about half palm beyond scaphocerite; fingers unarmed and two-thirds length of palm; upper margin of palm with weak irregular lobe, lower margin more or less straight. Both 1st pereopods with carpus, merus and ischium all unarmed. Colour in life light green

on carapace, banded with light and dark green on abdomen. Within *Edwardsi* group, *A. richardsoni* belongs to a bracket comprising the Indo-Pacific species *A. euphrosyne* de Man, *A. microrhynchus* de Man, *A. eurydactylus* de Man and *A. paludicola* Kemp as well as the Mediterranean (? derived from Red Sea) species *A. inopinatus* Holthuis & Gottlieb. From the first three and the last it differs in the form of the scaphocerite and in details of the large chela, while from *A. paludicola* it differs in the length of the rostrum, the form of the groove on the large chela and the shape of the male small chela.

Type material: Holotype, male, carapace length 10mm, dredged from 1-3 fms off Marriott Id, Waikare River Inlet, Bay of Islands, 28 December 1956, J. C. Yaldwyn (Dom. Mus. Z. Cr. 1873). Numerous paratypes from mangrove swamps and from intertidal and shallow water mudflats from Parengarenga Harbour in the north to Tauranga Harbour on the east coast and Manukau Harbour on the west.

This abundant New Zealand snapping shrimp, long confused with the true *Alpheus novaezealandiae*, is named after Professor L. R. Richardson who first recognized it as an undescribed species in 1952.

Family OGYRIDIDAE

Genus *Ogyrides* Stebbing, 1914

Ogyrides delli n.sp.

Ogyrides n.sp. Richardson & Yaldwyn, 1958: 36, fig. 31.

Rostrum short and triangular; carapace with 6 to 8 dorsal spines, antennal spine acute but very small. Telson with broadly convex, setose, distal margin flanked by one small spine at distal end of lateral margin: 2 pairs of small dorsal spines situated posterior to lateral expansion of telson. Eye extending beyond scaphocerite to reach distal margin of antennular peduncle. 2nd pereopod with 5 carpal subsegments. A bifurcate, anteriorly projecting, sternal plate between bases of 4th pereopods. Colour in life transparent with prominent, transverse bands of red posteriorly on each abdominal segment. Differs from all other species of *Ogyrides*, except the West and South African *O. saldanhae* Barnard and the West African *O. rarisipina* Holthius, by the presence of 5 carpal subsegments in the 2nd pereopod. From *O. rarisipina* it can be distinguished by the higher number of dorsal carapace spines (6-8 compared with 3-5) and by the distinctive shape and lateral spinulation of the telson. From *O. saldanhae* it can be distinguished by the relative length of the eye and also by the distinctive shape and lateral spinulation of the telson.

Type material: Holotype, male, carapace length 6mm, from stomach of gurnard, caught in 4 fms, Lowry Bay, Wellington Harbour, 31 May 1953, R. K. Dell & J. Moreland (Dom. Mus. Z. Cr. 1874). Paratypes from off North Auckland in north to Chatham Islands in the south, about 4 to 27 fms.

This species is named after Dr R. K. Dell, Director of the Dominion Museum.

Family HIPPOLYTIDAE

Genus *Hippolyte* Leach, 1814*Hippolyte multicolorata* n.sp.*Hippolyte* n.sp. Richardson & Yaldwyn, 1958: 35, fig. 27.

Rostrum slightly longer than carapace, downcurved distally, with a trifid apex, no dorsal rostral teeth and 4 to 9 ventral teeth. Carapace smooth, with supraorbital, antennal and branchiostegal spines. 6th abdominal segment with acute pleura. Telson with 2 pairs of dorsal spines and a truncate tip with one medial and 4 pairs of lateral spines. Stylocerite slightly shorter than distal segment of antennular peduncle, which bears a strong distal spine. Scaphocerite about three times as long as broad, lamellar apex reaching well beyond distal spine. Carpus of 2nd pereopod with 3 subsegments. 3rd to 5th pereopods with meral spines (about 5 on 3rd, 4 on 4th, 3 on 5th), with one carpal spine and about 10 spines on each dactyl. Colour in life highly variable (see Richardson & Yaldwyn, 1958: 35). Differs from all but five species of *Hippolyte* in the complete lack of teeth on dorsal surface of rostrum. Differs from the remaining five in the trifid rostral apex and the high number of ventral rostral teeth. Close to the variable Indopacific *H. ventricosa* H. Milne Edwards, with its synonym *H. australiensis* (Stimpson). Australian specimens of *H. ventricosa* almost invariably have no dorsal rostral teeth, but the weakly concave dorsal midline of the carapace, the simple acute rostral apex and the single meral spines on 3rd to 5th pereopods, clearly distinguish them from *H. multicolorata*.

Type material: Holotype, ovigerous female, carapace length 8.5mm, from intertidal algae, Island Bay, Wellington, 4 August 1953, R. K. Dell (Dom. Mus. Z. Cr. 1875). Paratypes from Wellington Harbour in the north to Otago Harbour in the south, intertidal algal zone to about 4 fms.

Genus *Hippolysmata* Stimpson, 1860*Hippolysmata (Hippolysmata) morelandi* n.sp.

Rostrum slightly less than half length carapace, armed with 5 to 6 teeth dorsally (the 3 posterior teeth of series being on dorsal surface of carapace) and 2 teeth ventrally; distal portion of dorsal surface without teeth. Carapace with rounded anterolateral margin, no pterygostomial spine. Distal margin of telson setose, bluntly pointed in midline, bearing a pair of long spines medially and a pair of short spines laterally. 1st pereopod with carpus subequal with palm. 2nd pereopod with 36 carpal and 15 meral subsegments. Meri of 3rd, 4th and 5th pereopods bearing 4 lateral and 2 ventral, 4 lateral and 2 ventral, and 3 lateral spines respectively. Dactyls of 3rd, 4th and 5th pereopods with 5 ventral spines in addition to terminal claw. Colour in life bright red with 3 longitudinal lateral bands of white on abdomen, 2 of which extend onto branchial region of carapace. Differs from all other members of the subgenus *Hippolysmata* in its combination of rostral formula, rostral length, absence of pterygostomial spine, 2nd pereopod subsegment numbers and colour pattern. Appears close to the Indopacific *H. (H.) kuekenthali* (de Man) but differs in the higher number of 2nd pereopod carpal subsegments and a longitudinally banded colour pattern rather than a transversely banded one.

Type material: Holotype, ovigerous female, carapace length 13.5mm, collected by "pronoxfish" fish poison from subtidal brown algal beds on rocky substrate down to a depth of about 20 feet, Bay of Islands, North Auckland, February 1961, J. Moreland (Dom. Mus. Z. Cr. 1876). Paratypes from same localities.

This species is named after Mr J. M. Moreland, Curator of Fishes at the Dominion Museum.

Family PROCESSIDAE

Genus *Processa* Leach, 1815

Processa moana n.sp.

Processa ?n.sp. Richardson & Yaldwyn, 1958: 34, fig. 32.

Rostrum extending slightly beyond eye, narrow and slender, with bifid apex but without a dorsal tooth. Antennal spine on carapace. Abdomen with pleura of 5th segment broadly rounded, pleura of 6th posteriorly acute. Telson with 2 pairs of dorsal spines, anterior pair in anterior third. Antennular peduncle with first segment longer than second and third combined, second a little longer than third. Scaphocerite long and narrow, lateral margin straight, distal spine projecting slightly beyond lamella. 2nd pereopods subequal, carpus with 13 subsegments, merus without distinct subsegments. 3rd and 4th pereopods with 4 meral and 2 ischial spines; 3rd to 5th pereopods without propodal spines. Differs from all other species of *Processa*, except the Indopacific *P. aequimana* Paulson and *P. coutierei* Nobili and the Atlantic *P. parva* Holthius, by having subequal 2nd pereopods and an antennal spine on the carapace. From these three species it is distinguished by having in combination a narrow, bifid rostrum extending slightly beyond the eye, a large number of carpal subsegments (13) and no distinct meral subsegments in the 2nd pereopods.

Type material: Holotype, male, carapace length 6mm, trawled off Cuvier Id, Bay of Plenty, 30 July 1956, 30-40 fms, S. G. Hume on m.v. *Ikatere* (Dom. Mus. Z. Cr. 1877). Paratypes from Bay of Plenty.

The specific name *moana* is formed from the Maori word for "sea" (*moana*) as used in the name for the Bay of Plenty (*Te Moana-a-Toi*).

Family PANDALIDAE

Genus *Parapandalus* Borradaile, 1899

Parapandalus costelloi n.sp.

Parapandalus sp. Richardson & Yaldwyn, 1958: 38, fig. 39.

Rostrum a little less than three times length of carapace; dorsal margin armed with 4 large teeth proximally and a large number (at least 15) small teeth distally; ventral margin with a large number (at least 30) small, closely and evenly spaced teeth. Carapace with antennal and pterygostomial spines. 3rd abdominal segment unarmed posteriorly. 6th abdominal segment twice length 5th and twice as long as deep anteriorly. Penultimate segment of 3rd maxilliped subequal with ultimate. 3rd to 5th pereopods very long and slender; propodus of 5th 1.5 times length of

carpus. No epipods on pereopods. Colour in life transparent with red rostrum, appendages and viscera; eyes black; eggs blue. Within *Parapandalus*, *P. costelloi* belongs to a group of species, *P. zurstrasseni* Balss; *P. adensameri* Balss, *P. richardi* (Coutière) and *P. miles* (A. Milne Edwards), characterized by the dorsal margin of the rostrum bearing a few large proximal teeth and smaller, unevenly-spaced distal teeth. *P. costelloi* differs in the relative size of the 6th abdominal segment from the Indopacific *P. zurstrasseni* and *P. adensameri*; and the North Atlantic *P. richardi*, and in the length, armature and relative depth of the rostrum from the Western Atlantic *P. miles*.

Type material: Holotype, male, carapace length 18mm, trawled off Astrolabe Reef, Bay of Plenty, January 1956, 65 fms, J. Costello (Dom. Mus. Z. Cr. 1878). Paratypes from Bay of Plenty, 65-120 fms.

This species is named after Mr J. Costello, managing-director of Union Fish & Ice Co. Ltd., Tauranga, who brought the first collections of this potentially commercial prawn to my notice in 1956.

Family CRANGONIDAE

Genus *Pontophilus* Leach, 1817

Pontophilus hamiltoni n.sp.

Pontophilus n.sp. Richardson & Yaldwyn, 1958: 40.

Rostrum relatively broad, expanding very slightly at abruptly truncate distal margin, which reaches beyond suborbital spine but not beyond eye. Carapace armed dorsally with 2 spines, the posterior one being a little anterior to midpoint of carapace but posterior to posterior spine of first lateral row; the anterior one is midway between orbit and posterior dorsal spine. Laterally on carapace at level of suborbital spine, there is a row of 4 spines, the penultimate spine of this row being larger and slightly higher on carapace than other three. Ventral to this row there is a strong hepatic spine, but there is no spine at level of branchiostegal spine. No sculpturing or carinae on abdomen; 5th abdominal segment with small, curved posterolateral tooth, but no posteroventral tooth. Scaphocerite relatively broad and long with unarmed outer margin straight and produced into a spine projecting a little beyond distal edge of lamella. Within *Pontophilus*, *P. hamiltoni*, and the New Zealand *P. australis* (Thomson) and *P. chiltoni* Kemp, belong to a group of species with the outer margin of the scaphocerite entire, the first four abdominal segments smooth and two spines on the middorsal line of the carapace. The three New Zealand species can be distinguished from all other members of this group by having 5 or 6 lateral spines on the carapace. *P. hamiltoni* differs from *P. australis* and *P. chiltoni* in having the dorsal carapace spines spaced apart (the posterior spine being at about the midpoint of carapace), the rostrum broad and distally truncate, no spine on carapace at level of branchiostegal spine (i.e. carapace with 5 lateral spines) and no posteroventral tooth on 5th abdominal pleuron.

Type material: Holotype, ovigerous female, carapace length 6.5mm, trawled off Portobello Marine Biological Station wharf, Otago Harbour, 14 August 1955, 2-4 fms, R. K. Dell & J. Moreland (Dom. Mus. Z. Cr. 1879). Paratypes from Wellington Harbour in the north to Stewart Island in the south, immediately subtidal to at least 55 fms.

This species is named after Augustus Hamilton, Director of the Dominion Museum, 1903-1913, who first collected it on the Foveaux Strait oysterbeds in 1903.

***Pontophilus quadrispinosus* n.sp.**

Pontophilus n.sp. Richardson & Yaldwyn, 1958: 41, fig. 50.

Rostrum slender, with bluntly rounded apex reaching as far as sub-orbital spine but not beyond eye. Carapace armed dorsally with 4 relatively evenly spaced, subequal spines. Laterally on carapace, at level of suborbital spine, there is a row of 4 subequal spines; ventral to this row is an hepatic spine, and finally at level of branchiostegal spine there is another spine, anterior to hepatic spine. No dorsal carinae on abdomen, but a very weak pair of dorsolateral carinae present on 6th abdominal segment; 5th segment with posterolateral and posteroventral angles, margin between them concave. Scaphocerite relatively broad and long with unarmed outer margin straight and produced into a spine projecting a little beyond distal edge of lamella. Differs from other species of *Pontophilus* by possessing in combination, an entire outer margin to the scaphocerite, the first four abdominal segments dorsally smooth and four spines on the middorsal line of the carapace.

Type material: Holotype, female, carapace length 3.5mm, from *Discovery* Expedition Stn 929, off Cape Reinga, North Auckland, approx. 34°21.5'S, 172°49'E, 16 August 1932, conical dredge or otter trawl on bottom at 58m (c.32 fms), R.R.S. *Discovery* II. Two paratype males from same station.

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