A COLLECTION OF THALASSINIDEA, ANOMURA AND BRACHYURA (CRUSTACEA: DECAPODA) FROM THE KIMBERLEY REGION OF NORTHWESTERN AUSTRALIA

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One hundred and five species of thalassinidean, anomuran and brachyuran decapod crustaceans are recorded from a 1988 collecting expedition to the Kimberley region of northwestern Australia. An additional 70 species are recorded from the literature. One new species of pagurid hermit crab and a new species of xanthid crab are described.

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Contents

Introduction and historic review

The Kimberley region of northwestern Australia extends from the vicinity of Broome (17°58'S, 122°14'E) to the Western Australian-Northern Territory border (14°26'S, 129°00'E) and is one of the least accessible areas of Australia. The coastline is largely uninhabited between a few small isolated towns (Broome, Derby, Wyndham) and land access to the coast is impossible for most of its length.

The remoteness and inaccessibility of the Kimberley coast have resulted in only limited European exploration and biological research. Early maritime explorers of the area included the Dutch navigator Abel Tasman in 1644. William Dampier sailed along a short stretch of the coast in the "Cygnet" in 1688, making land-fall on the west side of King Sound where a small biological collection may have been made (Marchant, 1988). Some scientific investigation of the Kimberley coast was carried out by the French expedition led by T. Nicolas Baudin on the "Naturaliste" in 1803. However, it appears that little or no biological study was undertaken in the Kimberley by the expedition's resident naturalist Francois Peron (Cornell, 1974).

Quite extensive biological collection, especially of flora and molluscs, was undertaken on Phillip Parker King's oceanographic surveys of the Kimberley coast aboard HMC "Mermaid" in 1819-1821. King's (1827) narrative also describes sightings of birds and mammals. The molluscs of King's expeditions were described by Gray (1827). Collections of mainly terrestrial invertebrates were made by J. Walker on the survey ship HMS "Penguin" in 1890-1891 and the molluscs described by Smith (1894).

Subsequent to the early maritime studies, there have been several terrestrial surveys and collecting expeditions to the Kimberleys (e.g. Brockman, 1902; Easton, 1922; Morgan, 1955). Limited terrestrial and freshwater biological work has continued including surveys of the Prince Regent and Drysdale River regions (Miles & Burbidge, 1975; Kabay & Burbidge, 1977), the offshore Kimberley islands (Burbidge and McKenzie, 1978) and the Mitchell Plateau and Admiralty Gulf areas (Wilson, 1981). These studies have concentrated on the flora and vertebrate fauna.

Most recently, in 1988, an Anglo-Australian scientific programme, jointly organised by the Royal Geographic Society and the Linnean Society of London, collected terrestrial biota from the Kimberleys. The results of this work are yet to be published.

The first extensive collection of marine biological specimens from northwestern Australia was undertaken during the Swedish Mjöberg Expeditions of 1910-1913. The only area of the Kimberleys sampled was that around Broome, while Cape Jaubert, 160 km to the south, was quite intensively collected. Several marine crustacean taxa were the subject of publications incorporating the Kimberley material e.g. Cirripedia (Broch, 1916), Stomatopoda, Macrura, Paguridea and Galatheidea (Balss, 1921), Cumacea (Zimmer, 1921) and Brachyura, Albuneidae and Porcellanidae (Rathbun, 1924), together with terrestrial isopods (Wahrberg, 1922) and some freshwater Phyllopoda and Ostracoda (Schwartz, 1917; Skogsberg, 1917). It must be emphasised that only a very small subsample of the material of these papers was derived from the Kimberleys and the marine specimens were collected only from the southernmost shores of that region. McCulloch (1918) recorded three species of brachyurans and two species of hermit crabs collected by a Dr Basedow from King Sound in the Kimberley region.

To the present day, biological investigation of the marine intertidal and subtidal habitats of the Kimberleys has been scant. Wells (1978, 1981) and Wells & Slack-Smith (1981) described aspects of the distribution of molluscs in Admiralty Gulf and nearby islands. Some assessment of molluscan, crustacean and fin-fish fishery species has been carried out (e.g., Dybdahl & Rose, 1986; Western Australian Department of Fisheries unpublished reports).

There have been no extensive collections made of crustaceans of the Kimberley coast. A number of taxonomic revisions and reviews include reference to specimens from the area e.g. Penaeidae (Dall, 1957), Porcellanidae (Haig, 1965), *Macrophthalmus* (Barnes, 1967), Alpheidae (Banner & Banner, 1975, 1982), Thalassinidea (Poore & Griffin, 1979), Cirolanidae (Bruce, 1986) and Majidae (Griffin & Tranter, 1986), but Kimberley representatives tend to be few.

During July 1988, a three week biological collecting expedition to the Kimberley coast was jointly organised by the Western Australian Museum, Perth, and the Field Museum of Natural History, Chicago. The purpose of the boat-based expedition was to collect invertebrate fauna from as many coastal habitats as possible, on both the mainland and offshore islands. Emphasis was placed on collection of marine and ter-

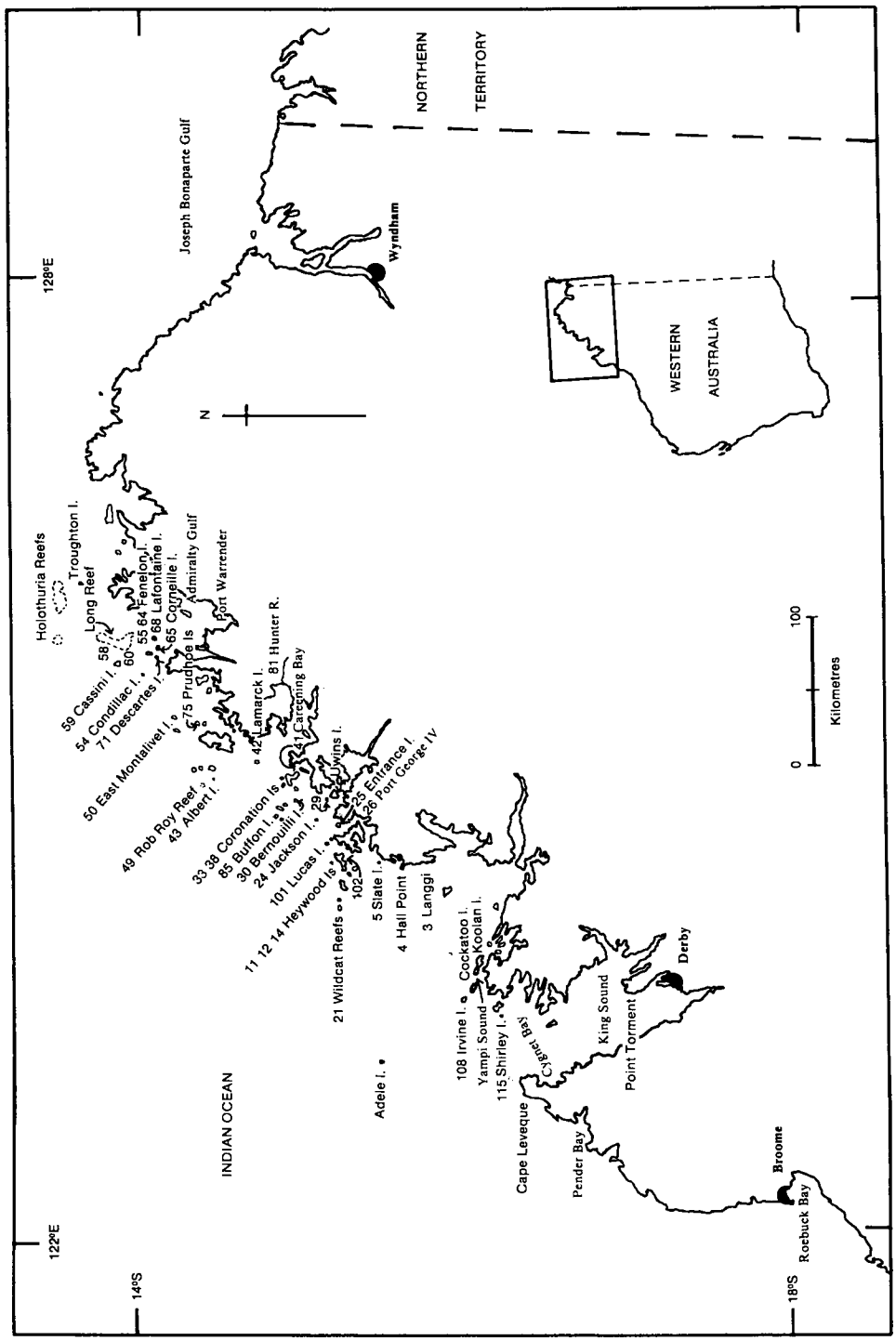

Fig. 1. Map of Kimberley region, showing localities and sampling stations mentioned in text.

restrial molluscs, polychaete worms and decapod crustaceans. The expedition was motivated by the dearth of information and specimens of Kimberley invertebrate faunas.

This paper reviews the thalassinidean, anomuran and brachyuran crustaceans collected on the expedition. Specimens were sampled by hand on intertidal flats and rock platforms and using SCUBA to a depth of 30 m. A small boat-towed dredge was used at some soft-bottomed subtidal sites. Particular attention was paid to xanthoid and hermit crabs, diverse inhabitants of tropical marine habitats and very poorly collected in the past.

Synonymies are abbreviated, with reference to the first use of any name and citations relevant to the Australian faunas. Size abbreviations used are SL (shield length) and CL (carapace length); dimensions of the carapace of porcellanids and brachyurans are cited as length × width. Two new species are described. Biogeographic affinities of species are discussed. Specimens are lodged in the Western Australian Museum, Perth (WAM) and the Rijksmuseum van Natuurlijke Historie, Leiden (RMNH). Most of the localities mentioned in the text are indicated in Fig. 1 and more detailed maps are provided by Burbidge & McKenzie (1978).

In addition, previous records of thalassinideans, anomurans and brachyurans from the Kimberleys are tabulated with collection localities.

Systematics

Infraorder Thalassinidea Latreille, 1831

Axiidae Huxley, 1879

Axiopsis (Paraxiopsis) brocki (De Man, 1887)

Axius Brocki De Man, 1887a: 475, pl. 20 fig. 3.
Axiopsis (Paraxiopsis) Brocki; De Man, 1905: 597; De Man, 1925: 7, 101, pl. 8 fig. 19.
Axiopsis (Paraxiopsis) brocki; Poore & Griffin, 1979: 228, fig. 3.

Material.— ♂, CL 6.5 mm, Lucas Island (stn 101), 3-29 m, sand and silt, some coral rubble, 24.vii.1988, WAM 115-89.

Remarks.— This is a common and widespread species in Western Australia.

Distribution.— Indonesia, Australia from Augusta in the southwest to Darwin in the north.

Scytoleptus serripes Gerstaecker, 1856

Scytoleptus serripes Gerstaecker, 1856; 158, pl. 6 figs. 1-4; De Man, 1925: 5, 49, fig. 9; Poore & Griffin, 1979: 243, fig. 11.
Evaxius tricarinatus Kingsley, 1882: 130, pl. 1 fig. 1.

Material.— ♂, CL 21.1 mm, Careening Bay (stn 41), intertidal sand and rocks, 13.vii.1988, WAM 993-88; ♂, CL 24.8 mm, Albert Island (stn 43), intertidal, rocks and coral, 14.vii.1988, WAM 989-88; ♂, CL 13.2 mm, East Montalivet Island (stn 50a), intertidal rocks on sand, 15.vii.1988, RMNH D 37756.

Remarks.— The lateral spines on the base of the rostrum can be more acute than described and illustrated by Poore & Griffin (1979).

Distribution.— East and south Africa, east to Indonesia, Australia from Exmouth Gulf north and east to Northern Territory.

Thalassinidae Latreille, 1831
Thalassina squamifera De Man, 1915

Thalassina anomala var. *squamifera* De Man, 1915: 445, pl. 29 fig. 16.
Thalassina anomala; Bennett, 1968: 22, figs. (part); McNeill, 1968: 26; Murray & Hanley, 1986: 59, figs. 3-6.
Thalassina squamifera; Campbell & Woods, 1970: 41; Poore & Griffin, 1979: 285, fig. 42.

Material.— Chela, Descartes Island (stn 71), mangal, mud, 20.vii.1988, WAM 210-89; chela, Shirley Island (stn 115), mangal, mud, 26.vii.1988, WAM 44-89.

Remarks.— Only detached chelae of *T. squamifera* were collected, though there is ample evidence of its burrowing activity in Kimberley Island mangals. The name *T. anomala* (Herbst) continues to be used for Australian specimens of the genus (e.g. Murray & Hanley, 1986) but I have accepted the diagnostic differences noted in detail by Poore & Griffin (1979) and assigned the name *T. squamifera* to the Kimberley material.

Hess (1865) described *Thalassina maxima* from Sydney (see also Haswell, 1882b). As noted by Poore & Griffin (1979), this locality is very unlikely. Hess's (1865) figure (pl. 7 fig. 18) of a cheliped of his species clearly illustrates an oblique tuberculate ridge on the lateral face of the propodus. This would suggest that his specimen was in fact *T. anomala* (Herbst) but the correct collection locality remains unknown.

Distribution.— Philippines, New Guinea, Indonesia, northern Australia from Exmouth in the west to Gladstone in the east.

Upogebiidae Borradaile, 1903
Upogebia (*Upogebia*) *carinicauda* (Stimpson, 1860)

Gebia carinicauda Stimpson, 1860: 23; Miers, 1884: 280.
Gebia barbata Strahl, 1861: 1062, figs. 7-9.
Upogebia carinicauda; De Man, 1928: 22, 60, pls 3, 4 figs. 6-6n.
Upogebia (*Upogebia*) *carinicauda*; Poore & Griffin, 1979: 292; Sakai, 1982: 35, pls A5, C5-6, text figs. 6d, 8a.

Material.— ♂, CL 12.8 mm, Entrance Island (stn 25), intertidal rocks, 12.vii.1988, WAM 127-89.

Remarks.— This is possibly the first specimen of the species to be lodged in an Australian museum (Poore & Griffin, 1979). Poore & Griffin (1979: 223) also noted that in *U. carinicauda* the "propod of pereopod 1 (is) dorsally smooth" while on this specimen there is a dorsal row of spines, albeit slightly smaller than in *U. giralia* Poore & Griffin.

Distribution.— Southeast Asia, Hong Kong, New Guinea, Samoan and Solomon

Islands, Northern Territory, Queensland and now recorded from northwestern Australia.

Infraorder Anomura H. Milne Edwards, 1832
Coenobitidae Dana, 1851
Coenobita spinosus H. Milne Edwards, 1837

Cenobita spinosa H. Milne Edwards, 1837: 242.
Coenobita olivieri Owen, 1839: 84.
Coenobita brunnea Dana, 1852b: 470; Dana, 1855: pl. 29 fig. 10a, b.
Birgus hirsutus Hess, 1865: 36, pl. 7 fig. 16.
Coenobita spinosus; Ortmann, 1892: 318, pl. 12 fig. 24; McCulloch, 1909: 305, pl. 88 fig. 1, 1a; Morgan, 1987a: 167.
Coenobita spinosus var. *variabilis* McCulloch, 1909: 305, pl. 88 fig. 2, 2a.

Material.— 2 ♂♂, SL 11.1, 4.8 mm, 4 ♀♀, SL 5.2-3.8 mm, Langgi (stn 3), supratidal sand, 9.vii.1988, WAM 104-89; ♂, SL 11.1 mm, 4 ♀♀, SL 9.7-9.2 mm, Hall Point (stn 4), inter- and supratidal sand and rocks, 9.vii.1988, WAM 2113-88 (3), RMNH D 37771 (2); 4 ♂♂, SL 2.2-1.7 mm, 2 ♀♀, 2.0 mm, 1.7 mm, Heywood Islands (stn 14), mangal, 10.vii.1988, RMNH D 39045; ♀, SL 4.9 mm, Coronation Island (stn 33), intertidal rocks, 13.vii.1988, WAM 2114-88; 10 specs, SL 2.8-1.4 mm, Corneille Island (stn 65), intertidal rocks, sand, mangal, 19.vii.1988, WAM 101-89; 15 specs, SL 7.2-1.7 mm, Katers Island (stn 72), intertidal rocks, 20.vii.1988, WAM 103-89; 2 ♂♂, SL 11.1, 5.1 mm, 2 ♀♀, 6.5, 4.5 mm, Wollaston Island (stn 74), intertidal rocks, 20.vii.1988, WAM 102-89.

Remarks.— The taxonomic uncertainty regarding this species has been discussed by Morgan (1987a). Kimberley specimens show considerable variation in the development of the stridulatory ridge on the palm of the left cheliped, some approaching the condition of *C. rugosus* H. Milne Edwards, others with only a few enlarged dorsal tubercles. All specimens show a distinct tuft of long setae on the ventral surface of the merus of the right cheliped. There is a strong possibility that this nominal species is polyspecific (A. Harvey, pers. comm.).

Coloration agreed with that of northern Australian animals described by Morgan (1987a).

Specimens were collected from shells of *Monodonta labio* (Linnaeus), *Turbo cinereus* Born, *Thais kieneri* (Deshayes), *Ancillista cingulata* (Sowerby), *Clypeomorus* cf. *batillariaeformis* Habe & Kosuge and other cerithiids, *Cronia avellana* (Reeve), *Nassarius glans glans* (Linnaeus), *Planaxis sulcatus* (Born) and several unidentified species.

Distribution.— Uncertain due to taxonomic problems. Nominal species recorded from east Africa to Tahiti, northern Australia from Exmouth Gulf to north Queensland.

Diogenidae Ortmann, 1892
Calcinus gaimardii (H. Milne Edwards, 1848)

Pagurus gaimardii H. Milne Edwards, 1848: 63.
Calcinus gaimardii; Dana, 1852b: 457; Dana, 1855: pl. 28 fig. 9; Stimpson, 1858: 234; Alcock, 1905: 56, pl. 5 fig. 3; Grant & McCulloch, 1906: 35; McNeill, 1968: 27; Ball & Haig, 1972: 101; Haig & Ball, 1988: 159.

Calcinus gaimardi; Fize & Serène, 1955: 49, pl. 2 figs. 5-8, text-figs. 7, 8; Miyake, 1956: 326, figs. 16, 17; Lee, 1969: 54, fig. 11; Haig & McLaughlin, 1984: 108; Wooster, 1984: 131.

Material examined.— 2 ♂♂, SL 8.1, 6.3 mm, ♀, 3.7 mm, Cassini Island (stn 59), intertidal rocks and coral, 18.vii.1988, WAM 2100-88.

Remarks.— Coloration and morphology of this widespread intertidal species are adequately described by the above workers. The Kimberley specimens were collected from an unidentified fasciolariid spec.

Distribution.— East Africa east to Indonesia, Japan, northeastern and now recorded from northwestern Australia, New Guinea, Hawaiian and Tuamotu Islands.

Calcinus guamensis Wooster, 1984

Calcinus guamensis Wooster, 1984: 141, fig. 4; Haig & McLaughlin, 1984: 107; Haig & Ball, 1988: 159.

Material.— ♂, SL 2.5 mm, Rob Roy Reef (stn 49), 8-9 m, live corals, 15.vii.1988, WAM 2096-88.

Remarks.— The colour and morphology of the species are adequately described by Wooster (1984) and Haig & Ball (1988). It appears that *C. guamensis* has been confused by some workers with *C. latens* (Randall) (see Distribution below). *C. guamensis* is very similar to *C. vachoni* Forest as is discussed in this paper for the latter species. Haig & McLaughlan (1984) noted that the paper by Wooster (1984) in Micronesica is dated 1982 (to be precise, December 1982) but in fact was published in February 1984. Haig & McLaughlan's paper is dated December 1983 but also was published in 1984 (see Haig & Ball, 1988: 194).

Distribution.— Mariana and Hawaiian Islands, Indonesia, now recorded from northwestern Australia. Probably from Vietnam as aberrant *C. vachoni* (in Forest, 1958) and southern Japan as *C. latens* (in Miyake, 1956, see Haig & McLaughlin, 1984) and as *C. vachoni* (in Miyake, 1978, see remarks for *C. vachoni* this paper).

Calcinus latens (Randall, 1839)

Pagurus latens Randall, 1839: 135.
Pagurus cristimanus H. Milne Edwards, 1848: 64.
Calcinus cristimanus; Heller, 1862a: 254; Stimpson, 1858: 234.
Calcinus intermedius De Man, 1881: 102.
Calcinus terrae-reginae Haswell, 1882a: 760; Haswell, 1882b: 158; Alcock, 1905: 57, pl. 5 fig. 7.
Calcinus latens; Dana, 1852b: 459; Dana, 1855: pl. 28 fig. 11; Heller, 1865: 88; Alcock, 1905: 58, pl. 5 fig. 5; Grant & McCulloch, 1906: 34; McNeill, 1926b: 304; Fize & Serène, 1955: 58, pl. 2 figs. 9-11, text-fig. 9; McNeill, 1968: 27; Lee, 1969: 53, fig. 12; Lewinsohn, 1969: 48; Ball & Haig, 1972: 101; Wooster, 1984: 154; Haig & McLaughlin, 1984: 107; Haig & Ball, 1988: 160; Morgan, 1989: 406.

Material.— ♂, SL 4.3 mm, Albert Island (stn 43), intertidal, 14.vii.1988, RMNH D 37805; ♀ (ovig.), SL 5.1 mm, Cassini Island (stn 59), intertidal rocks and coral, 18.vii.1988, WAM 2101-88.

Remarks.— One of the most ubiquitous and widespread hermit crabs of the Indo-West Pacific, *C. latens* has been redescribed and discussed by numerous work-

ers. Some dispute has arisen over the pattern of coloration of the proximal dark band on the second and third pereiopods. Some workers describe the band as solid colour (e.g. Edmondson, 1946; Ball & Haig, 1972; Wooster, 1984), while others note short dark longitudinal stripes on a slightly paler background (e.g. Haig & McLaughlin, 1984). In an effort to resolve this small discrepancy, Haig & Ball (1988) suggested that the solid band is "probably typicai of live specimens in most parts of the Indo-West Pacific" and that the short stripes appear in preserved material. This suggestion is not applicable to the Kimberley specimens nor to other Australian animals (pers. obs.) which display red or purple dactylar stripes on a pink or blue-pink background in the live condition.

The Kimberley specimens were collected from shells of *Cerithium echinatum* Lamarck and *Rhinoclavis brettinghami* Cernohorsky.

Distribution.— East Africa and Red Sea to southeast Asia, Japan, east to Hawaiian and Tuamotu Islands, Australia from Rottnest Island north and east to Sydney region.

Calcinus minutus Buitendijk, 1937

Calcinus minutus Buitendijk, 1937: 269, figs. 13-15; Forest, 1958: 185, figs. 1, 6-8, 14, 18; Ball & Haig, 1972: 102; Wooster, 1984: 152; Haig & Ball, 1988: 160.

Material.— ♂, SL 4.4 mm, 2 ♀♀, SL 2.7, 2.6 mm, ♂♀, SL 3.1 mm, Rob Roy Reef (stn 49), 8-9 m, coral and coral rubble, 15.vii.1988, WAM 2097-88; 2 ♂♂, SL 4.0, 3.4 mm, Long Reef (stn 58), to 15 m, *Acropora* and *Pocillopora* corals, 17.vii.1988, WAM 2098-88.

Coloration (in life).— Shield cream with scattered orange dots, sometimes faint pale orange patch anteromedially. Ocular peduncles cream or very pale brown, some brown-orange proximally; ocular acicles cream with brown-orange distally; corneas black. Antennular peduncles with proximal two segments brown; ultimate segment brown on proximal half, cream or white distally; flagella pale orange. Antennal peduncles brown and cream; flagella very pale brown. Chelipeds white with minute to small orange spots on pores; propodus sometimes with pale diffuse orange patch mesially on palm; carpus sometimes with orange patch dorsally; merus usually with pale orange patch on mesial and lateral faces. Pereiopods 2 and 3 cream or white with scattered orange spots on setal pores; dactyl bright orange with some cream at tip; propodus orange distally.

Remarks.— *Calcinus minutus* is a common Indo-West Pacific species, associated with reef corals. The species has been redescribed adequately by Forest (1958: 185) and more briefly by Wooster (1984: 152) but the Australian specimens show interesting colour variation. *C. minutus* closely resembles *C. nitidus* Heller, and coloration of live specimens is a major tool for their discrimination (Forest, 1956a, 1958). Forest recorded that *C. minutus* can be distinguished by the absence of obvious red-orange patches anteromedially on the shield and on the mesial and lateral faces of the merus and propodus of chelipeds. As recorded above, the Kimberley specimens show variable development of orange patches on those sites thus approaching the *C. nitidus* condition. The dactyl and distal propodus of pereiopods 2 and 3 are orange and the other pereiopod segments cream or white, agreeing with the *C. minutus* condition.

Wooster (1984: 153) recorded the pale orange medial area on the shield of Guam specimens of C. *minutus* and Ball & Haig (1972: 102) noted the presence of brown spots on the mesial surfaces of the merus, carpus and chela of chelipeds of New Guinea specimens. Morphological differences between the species are very minor (Forest, 1958: 190) and thus convergence in coloration must further blur specific recognition.

The three males of C. *minutus* examined here show some evidence of rudimentary female gonopores and one specimen from stn 49 has male and female pores apparently equally developed.

The Kimberley specimens were collected from shells of *Drupella cornus* (Röding), *Morula* spec. and an unidentifiable thaid spec.

Distribution.— Red Sea, southeast Asia, Japan, New Guinea, Mariana Islands, now recorded from northwestern Australia.

Calcinus vachoni Forest, 1958
(fig. 2)

Calcinus vachoni Forest, 1958: 285, figs. 2, 3, 9, 10, 15, 19; Wooster, 1984: 137.

Material.— ♂, SL 2.9 mm, Long Reef (stn 58), subtidal to 15 m, 17.vii.1988, WAM 2099-88.

Coloration (in life).— Shield cream with pale grey area medially and darker grey-brown patches submedially; pale yellow laterally with dark brown areas along lateral faces. Two dark black-brown spots adjacent to cervical groove, equidistant from midline. Smaller, paler dot on thorax at posterior margin of shield, on midline. Ocular peduncles dark grey with large dorsal areas of black subproximally, these areas punctuated by small paler spots at setal pores; cream or white proximal to black areas and thin white line at base of corneas; ocular acicles grey; corneas black. Antennular peduncles mostly grey, penultimate segment with broad black-brown band over most of surface; flagella very pale orange. Antennal peduncles mottled grey and cream, ultimate segment pale orange; flagella orange-red. Chelipeds with dactyl cream; propodus finger cream, palm grey-green; carpus and merus grey. Pereiopods 2 and 3 with dactyl cream; propodus cream with pale grey tinge on proximal half; carpus and merus cream with grey tinges, grey more intense on merus. Pereiopods 4 and 5 cream-yellow and grey.

Remarks.— The single specimen of C. *vachoni* agrees well with the description in Forest (1958) with the exception that the ocular acicles possess only two distal spines and the right posterior lobe of the telson bears more numerous marginal spines (eight) extending onto the lateral edge (fig. 2f). The coloration of the species is variable (Forest, 1958) and the colours of this specimen are noted above. Forest's figures are clear and accurate but the shield and cephalic appendages of this Australian specimen are depicted here to show the very distinctive dark patterning on the ocular and antennular peduncles (fig. 2a). Forest did not describe or illustrate the smaller right cheliped of C. *vachoni* which is here figured, together with the left cheliped for comparison (fig. 2b, c). Forest also did not illustrate the second pereiopod which differs from pereiopod 3 in proportions and setation, and these appendages are illustrated here again for comparison (fig. 2d, e).

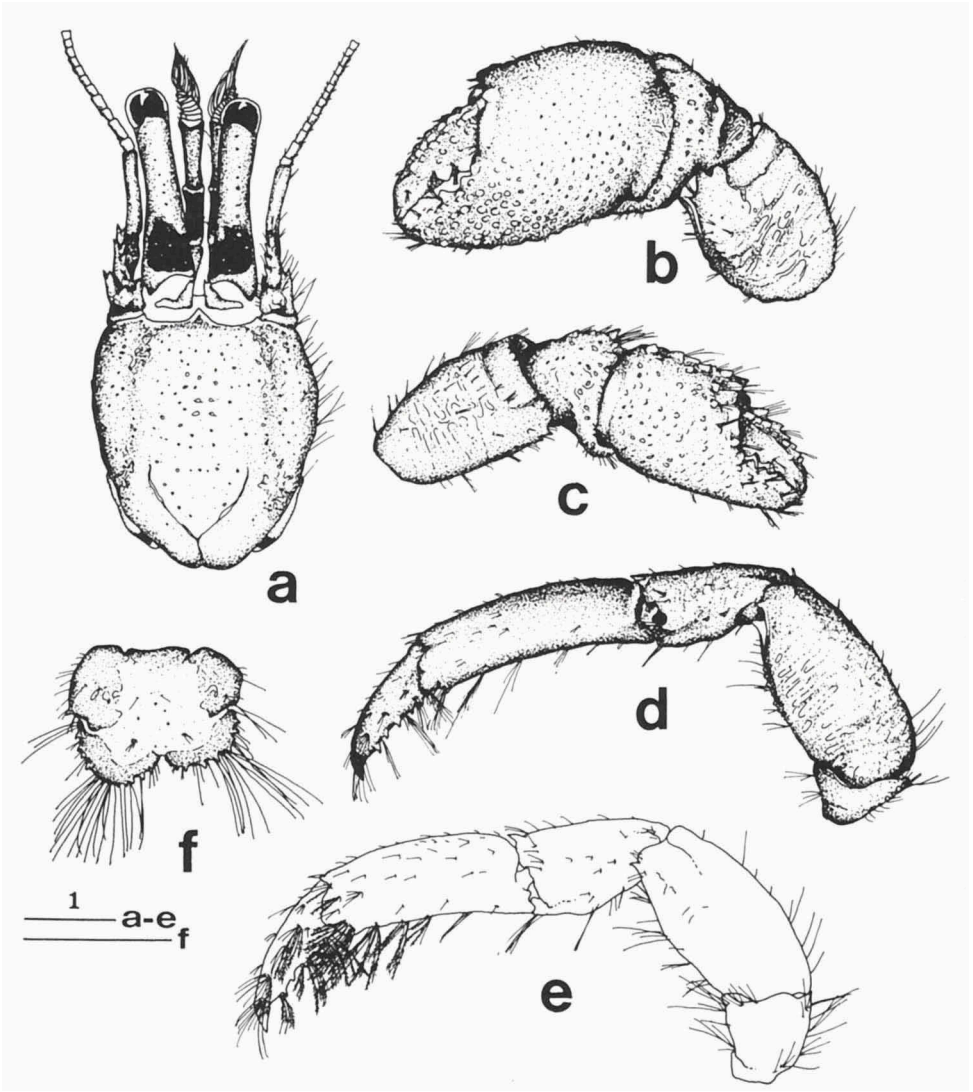

Fig. 2. *Calcinus vachoni* Forest, ♂ WAM 2099-88. a, shield and cephalic appendages (dorsal view) (setae omitted left side); b, left cheliped (lateral view); c, right cheliped (lateral view); d, left second pereiopod (lateral view); e, left third pereiopod (lateral view); f, telson (dorsal view). Scales = 1.0 mm.

Forest (1958) distinguished *C. vachoni* from *C. minutus* Buitendijk, *C. nitidus* Heller and *C. rosaceus* Heller. The species is also very similar to *C. guamensis* Wooster, a widespread species in the Indo-West Pacific. The specimen and description of *C. vachoni* were compared to the description of *C. guamensis* in Wooster (1984) and to specimens definitely identifiable as *C. guamensis* from Christmas Island, Indian Ocean (WAM 564-87). The species are similar in spination of the chelipeds, pereiopods 2 and 3, ocular acicles and telson and in the length of the ocular peduncles. Morphological differences are small but the dactyl of pereiopods 2 and 3 is distinctly shorter and its setation more sparse on *C. guamensis* (cf. Wooster, 1984: fig. 4).

Wooster noted that *C. guamensis* has about three spines along the ventral edge of the dactyl but specimens can display up to five spines, similar to *C. vachoni*.

The species can be distinguished easily on the basis of coloration. Although *C. guamensis* shares the dark brown or black band on the ocular peduncles, on that species the band is much more extensive occupying about half the length of the ocular peduncles. In addition, *C. guamensis* has the carpus and distal third of the merus of the chelipeds, and the proximal third of the dactyl of pereiopods 2 and 3, predominantly black. *C. guamensis* also has a small black spot at the base of the dactyl of pereiopod 4. The colours noted for *C. vachoni* by Miyake (1978: 54) in a key to the Japanese species of *Calcinus* are certainly incorrect and would appear to refer to *C. guamensis*. Similarly, the colour notes for an unusual female specimen discussed under *C. vachoni* by Forest (1958: 287) agree with the colours of *C. guamensis*.

The setation of the dactyl and distal part of the propodus of the third pereiopod of *C. vachoni* approaches the "brush" condition of *C. gaimardii* (H. Milne Edwards) and *C. elegans* (H. Milne Edwards) referred to frequently in keys and descriptions of *Calcinus* species (e.g. Miyake, 1978; Haig & McLaughlin, 1984; Wooster, 1984). The setal brush is far sparser than in the latter two species however, and in this intermediate condition *C. vachoni* resembles *C. laurentae* Haig & McLaughlin and *C. argus* Wooster.

Neither *C. vachoni* nor *C. guamensis* are common in the Kimberleys. The specimen of *C. vachoni* was collected from the eroded shell of a fasciolariid, possibly *Peristernia incarnata* (Deshayes).

Distribution.— Vietnam and now recorded from northwestern Australia. (Record for Japan in Miyake (1978) probably refers to *C. guamensis*, see above).

Clibanarius longitarsus (De Haan, 1849)

Pagurus longitarsus De Haan, 1849: 211, pl. 50 fig. 3.
Clibanarius longitarsis; Dana, 1852b: 464.
Clibanarius longitarsus; De Man, 1902: 741; Fize & Serène, 1955: 83, pl. 3 figs. 1, 7, 10, 13, text-fig. 11; Lee, 1969: 44; Morgan, 1987a: 172; Haig & Ball, 1988: 163.

Material.— 4 ♂♂, SL 4.0-2.6 mm, 4 ♀♀, SL 2.7-1.7 mm, Slate Island (stn 5), intertidal sand, 9.vii.1988, WAM 2076-88; ♂, SL 3.4 mm, Heywood Islands (stn 12), intertidal sand, 10.vii.1988, WAM 2082-88; ♂, SL 1.9 mm, 2 ♀♀, SL 4.2, 2.0 mm, Heywood Islands (stn 14), mangal, sand, 10.vii.1988, WAM 2083-88; 3 ♂♂, SL 4.1, 3.3, 2.0 mm, 3 ♀♀, SL 3.1, 2.8, 2.3 mm, Jackson Island (stn 24), intertidal sand near mangal, 11.vii.1988, WAM 2080-88; 3 ♂♂, SL 3.1, 2.7, 1.3 mm, ♀, SL 1.6 mm, Entrance Island (stn 25), intertidal rocks and sand, 12.vii.1988, WAM 2079-88; 3 ♂♂, SL 9.8, 7.6, 2.2 mm, 2 ♀♀, SL 9.1, 1.9 mm, Bernouilli Island (stn 30), intertidal sand in and near mangal, 12.vii.1988, WAM 39-89; 2 ♂♂, SL 2.7, 2.6 mm, 3 ♀♀, SL 3.2, 2.6, 2.3 mm, Coronation Island (stn 38), mangal, sand, 13.vii.1988, WAM 2078-88; 4 ♂♂, SL 6.4-5.5 mm, ♀, SL 1.6 mm, Careening Bay (stn 41), intertidal, in and near mangal, 13.vii.1988, RMNH D 37794; 14 specs, SL 3.0-1.2 mm, Corneille Island (stn 65), mangal, mud-sand, 19.vii.1988, RMNH D 37790; ♂, SL 2.2 mm, Descartes Island (stn 71), intertidal sand, 20.vii.1988, WAM 100-89; ♂, SL 8.3 mm, Prudhoe Islands (stn 75), intertidal sand and rocks, 21.vii.1988, RMNH D 37789; ♀, SL 6.6 mm, Shirley Island (stn 115), intertidal sand near mangal, 26.vii.1988, WAM 2081-88.

Remarks.— Coloration of *C. longitarsus* has been discussed by Fize and Serène (1955), Ball & Haig (1972), Morgan (1987a) and Haig & Ball (1988). Colours appear to

vary somewhat over the range of the species and a species complex has been suggested (Fize & Serène, 1955). Kimberley material agrees well with specimens from the Northern Territory (Morgan, 1987a).

Specimens were collected from shells of *Morula margariticola* (Broderip), *Nerita lineata* Gmelin, *Cerithium coralium* Kiener and other cerithiids, *Vexillum plicarium* (Linnaeus), *Terebralia palustris* (Linnaeus), *Cerithidea largillierti* (Philippi), *Turritella terebra* (Linnaeus), *Strombus urceus* Linneaus, *Thais kieneri* (Deshayes), *Turbo cinereus* Born and *Planaxis sulcatus* (Born).

Distribution.— East and south Africa and Red Sea to Japan, Vietnam, New Guinea, Philippines, Indonesia, northern and northwestern Australia.

Clibanarius taeniatus (H. Milne Edwards, 1848)

Pagurus clibanarius; Quoy & Gaimard, 1824: 529, pl. 78 fig. 1 (not *Clibanarius clibanarius* (Herbst, 1791)).
Pagurus taeniatus H. Milne Edwards, 1848: 63.
Clibanarius taeniatus; Stimpson, 1858: 235; Miers, 1884: 265; Grant & McCulloch, 1906: 34; McCulloch, 1913: 349, pl. 11 fig. 1; McNeill, 1968: 30; Morgan, 1987a: 173.

Material.— 2 ♂♂, SL 5.3, 2.1 mm, 3 ♀♀, SL 6.0, 3.4, 2.8 mm, Slate Island (stn 5), intertidal rocks and sand, 9.vii.1988, WAM 2075-88; 2 ♀♀, SL 3.5, 2.3 mm, Heywood Islands (stn 11), intertidal sand, 10.vii.1988, WAM 2073-88; 3 ♂♂, SL 3.5, 3.4, 3.3 mm, 3 ♀♀, SL 4.0, 3.2, 1.9 mm, Jackson Island (stn 24), intertidal sand, 11.vii.1988, WAM 2074-88; 2 ♂♂, SL 8.3, 2.1 mm, Bernouilli Island (stn 30), intertidal sand, 12.vii.1988, WAM 2072-88; 2 ♂♂, SL 4.0, 3.3 mm, ♀, SL 6.1 mm, Careening Bay (stn 41), intertidal sand, 13.vii.1988, WAM 2071-88; 3 ♂♂, SL 2.6, 2.1, 2.1 mm, ♀, SL 3.5 mm, Corneille Island (stn 65), intertidal sand and rocks near mangal, 19.vii.1988, RMNH D 37792; 6 ♂♂, SL 7.2-2.6 mm, Descartes Island (stn 71), intertidal sand, 20.vii.1988, RMNH D 37793; ♀, SL 3.4 mm, Prudhoe Islands (stn 75), intertidal sand, 21.vii.1988, WAM 97-89; 2 ♂♂, SL 3.6, 3.3 mm, ♀, SL 3.6 mm, Shirley Island (stn 115), intertidal sand, 26.vii.1988, RMNH D 37791.

Remarks.— Coloration of northern Australian specimens has been described by Morgan (1987a). Some Kimberley specimens, especially smaller animals, were very pale in life, with the areas of blue-green particularly etiolated. Also discussed by Morgan (1987a) was the close similarity of *C. taeniatus* with *C. padavensis* De Man. The two species have probably been confused in the past and the record of *C. padavensis* from Koolan Island (spelt "Kollan Island"), Kimberleys, by McCulloch (1918: 2) must be regarded with suspicion. *C. taeniatus* is a common and widespread inhabitant of intertidal sand and mangrove flats and rocky platforms of northern and northwestern Australia but *C. padavensis* was not collected during the present survey nor previously from the Northern Territory (Morgan, 1987a). McCulloch (1913: 349) recorded the latter species from Torres Strait and north Queensland but I have not examined those specimens.

C. taeniatus was collected from shells of *Turbo foliaceus* Philippi, *Morula margariticola* (Broderip), *Clypeomorus* cf. *batillariaeformis* Habe & Kosuge and other cerithiids, *Thais kieneri* (Deshayes), *Strombus urceus* Linnaeus, *Tectus niloticus* Linnaeus, *Astralium rotularia* (Lamarck), *Cronia avellana* (Reeve) and *Planaxis sulcatus* (Born).

Distribution.— Northern Australia from Shark Bay in the west to Port Hacking in the east.

Clibanarius virescens (Krauss, 1843)

Pagurus virescens Krauss, 1843: 56, pl. 4 fig. 3.

Clibanarius virescens; Dana, 1852b: 466; Dana, 1855: pl. 29 fig. 6a, b; Grant & McCulloch, 1906: 34; McCulloch, 1913: 346, pl. 11 fig. 2; Barnard, 1950: 435, fig. 80b, c; Fize & Serène, 1955: 138, fig. 21; McNeill, 1978: 28; Lee, 1969: 49; Miyake, 1978: 50, pl. 3 figs. 3, 4; Morgan, 1987a: 171; Haig & Ball, 1988: 163; Morgan, 1988: 317.

Material.— ♂, SL 2.8 mm, Slate Island (stn 5), intertidal rocks and sand, 9.vii.1988, WAM 2094-88; 19 specs, SL 4.2-2.6 mm, Heywood Islands (stn 11), intertidal rock platform, 10.vii.1988, WAM 2090-88; 4 ♂♂, SL 4.0-2.0 mm, ♀, SL 2.1 mm, Heywood Islands (stn 12), intertidal sand and rocks, 10.vii.1988, WAM 2091-88; 20 specs, SL 6.8-2.0 mm, Jackson Island (stn 24), intertidal rocks and sand, 11.vii.1988, WAM 2089-88; 4 ♂♂, SL 4.2-3.4 mm, 3 ♀♀, SL 3.7 (ovig.), 3.7, 3.5 mm, rubble spit near Jackson Island (stn 24), intertidal, 11.vii.1988, RMNH D 37788; 20 specs, SL 5.1-1.7 mm (incl. 2 ovig. ♀♀), Bernouilli Island (stn 30), intertidal rocks and sand, 12.vii.1988, WAM 2086-88; ♀, SL 4.3 mm, Coronation Islands (stn 33), intertidal rocks, 13.vii.1988, WAM 2087-88 ; 4 ♂♂, SL 7.0-3.8 mm, 3 ♀♀, SL 4.5, 3.2, 3.0 mm (ovig.), Careening Bay (stn 41), intertidal rocks, 13.vii.1988, WAM 2085-88; 13 specs, SL 6.2-1.7 mm, Albert Island (stn 43), intertidal rock platform, 14.vii.1988, RMNH D 37780; 5 ♂♂, SL 2.4-1.7 mm, 2 ♀♀, SL 1.8, 1.5 mm, East Montalivet Island (stn 50a), intertidal rocks, 15.vii.1988, WAM 2095-88; 5 ♂♂, SL 2.9-1.7 mm, 3 ♀♀, SL 3.1-2.2 mm, Condillac Island (stn 54a), intertidal rocks and sand, 16.vii.1988, WAM 944-88; 2 ♂♂, SL 4.4, 3.7 mm, 8 ♀♀, 3.9-2.6 mm, Fenelon Island (stn 55), intertidal limestone platform, 17.vii.1988, RMNH D 37779; ♂, SL 5.5 mm, Descartes Island (stn 71), intertidal sand, 20 .vii.1988, WAM 94-89; 14 specs, Prudhoe Islands (stn 75), intertidal rock platform, 21.vii.1988, WAM 93-89.

Remarks.— Coloration of this species has been discussed by McCulloch (1913), Fize & Serène (1955), Morgan (1987a, 1988) and Haig & Ball (1988). *C. virescens* is the most common hermit crab on intertidal rock platforms in the Kimberleys, often associating in vast numbers on the edge of rock pools and under rocks.

Specimens were collected from shells of *Monodonta labio* (Linnaeus), *Nerita lineata* Gmelin, *N. squamulata* Le Guillou, *Morula margariticola* (Broderip), *M. granulata* (Duclos), *Calliostoma* spec., cerithiids including *Cerithium coralium* Kiener, *C. echinatum* Lamarck, *C. novaehollandiae* A. Adams and *Rhinoclavis brettinghami* Cernohorsky, *Strombus vittatus* Linnaeus, *S. urceus* Linnaeus, *Turbo cinereus* Born, *Thais kieneri* (Deshayes), *T. aculeata* (Deshayes), *Terebra affinis* Gray, *Peristernia incarnata* (Deshayes), *Cronia avellana* Reeve, *Conus* cf. *miliaris* Hwass in Bruguière and *Planaxis sulcatus* (Born).

Distribution.— East Africa to Indonesia, Japan, east to Fiji Islands, northern Australia from Geraldton in the west to Port Jackson in the east.

Dardanus deformis (H. Milne Edwards, 1836)

Pagurus deformis H. Milne Edwards, 1836: 272, pl. 13 fig. 4; Alcock, 1905: 88, pl. 9 fig. 4; Grant & McCulloch, 1906: 37; Fize & Serène, 1955: 199, pl. 4 fig. 6, text-figs. 31, 33 E, F.

Pagurus cavipes White, 1847b: 122; Stimpson, 1858: 233.

Pagurus difformis; Dana, 1852b: 449 (misspelling).

Dardanus deformis; Edmondson, 1925: 24; McNeill, 1926b: 303; McNeill, 1968: 30; Lee, 1969: 47; Ball & Haig, 1972: 93.

Material.— ♂, SL 14.4 mm, East Montalivet Island (stn 50a), intertidal rocks on sand and shell grit, 15.vii.1988, WAM 2106-88.

Coloration (3 months in alcohol).— Dark brown-orange band immediately proximal to corneas and another proximally on ocular peduncles. Pereiopods diffusely banded in pale brown-orange usually darkest at midlength of segments; dactyl fairly uniformly pale orange.

Remarks.— This species is similar to *D. pedunculatus* (Herbst) and confusion in recognising the two species has occurred in the past (e.g. McNeill, 1926b: 303). Fize & Serène (1955) discussed and figured the specific differences in some detail, making recognition quite straightforward. Live coloration of *D. deformis* was not recorded at length until Ball & Haig (1972) but they did not record the diffuse bands on pereiopods noted above and by Lee (1969).

The Kimberley specimen, while certainly male, also bears rudimentary female gonopores. It was collected from a *Tonna allium* (Dillwyn) shell.

Distribution.— East Africa and Red Sea east to Hawaiian and Tuamotu Islands, including New Guinea, Philippines, Taiwan, northeastern and now northwestern Australia.

Dardanus lagopodes (Forskål, 1775)

Cancer lagopodes Forskål, 1775: 93.

Pagurus sanguinolentus Quoy & Gaimard, 1824: 532, pl. 79 fig. 2; Forest, 1953: 559, figs. 12-14; Fize & Serène, 1955: 166, pl. 4 figs. 4, 5, text-fig. 25.

Pagurus affinis H. Milne Edwards, 1836: 274.

Pagurus euopsis Dana, 1852b: 452; Dana, 1855: pl. 28 fig. 6; Alcock, 1905: 86, pl. 9 fig. 2; Grant & McCulloch, 1906: 37.

Pagurus depressus Heller, 1861a: 22.

Dardanus hellerii Paulson, 1875: 90, pl. 12 fig. 4.

Dardanus sanguinolentus; McNeill, 1968: 31.

Dardanus lagopodes; Lewinsohn, 1969: 32, pl. 2 figs. 1, 2; Lee, 1969: 50; Ball & Haig, 1972: 92; Morgan, 1987a: 181; Haig & Ball, 1988: 166.

Material.— ♀, SL 12.2 mm, Albert Island (stn 43), intertidal rocks and coral, 14.vii.1988, WAM 2103-88; ♂, SL 8.9 mm, Rob Roy Reef (stn 49), to 31 m, limestone and coral, 15.vii.1988, RMNH D 37803; ♂, SL 16.2 mm, Condillac Island (stn 54), 10 m, sand and coral, 16.vii.1988, WAM 2105-88; 2 ♂♂, SL 13.8, 7.0 mm, ♀, SL 10.4 mm, Cassini Island (stn 59), intertidal rocks and coral, 18.vii.1988, WAM 2104-88; ♀, SL 7.0 mm, reef west of Buffon Island (stn 85), 3-22 m, sand, coral, coral rubble, 23.vii.1988, RMNH D 37804.

Remarks.— This is a variable species, both in morphology and coloration (Fize & Serène, 1955; Forest, 1953; Ball & Haig, 1972: Morgan, 1987a; Haig & Ball, 1988). Although *D. lagopodes* is quite large and distinct, this is only the third record of it from Australia. Unlike the Northern Territory animals discussed by Morgan (1987a), all Kimberley specimens collected are of the "red" form, with a bright red patch on the carpus of chelipeds and pereiopods 2 and 3. Specimens inhabiting shells with narrow apertures are usually more flattened dorsoventrally than are animals in wide-mouthed shells.

The Kimberley specimens were collected from shells of *Tectus fenestratus* Gmelin, *Angaria delphinus* (Linnaeus) and *Lambis chiragra* (Linnaeus).

Distribution.— Red Sea and east Africa to New Guinea, Japan east to Tuamotu Archipelago; northern, northeastern and now recorded from northwestern Australia.

Diogenes avarus Heller, 1865

Diogenes avarus Heller, 1865: 83, pl. 7 fig. 2; Alcock, 1905: 68, pl. 6 fig. 6; Forest, 1956b: 524, figs. 1-4; Grant & McCulloch, 1906: 35; Lewinsohn, 1969: 37, fig. 4; Morgan, 1987a: 174; Haig & Ball, 1988: 167.

Material.— ♀ (ovig.), SL 2.1 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, WAM 2053-88; 5 ♂♂, SL 3.9-2.3 mm, 2 ♀♀, SL 2.5 (ovig.), 2.4 mm, Careening Bay (stn 41), intertidal sand, 13.vii.1988, WAM 2052-88; ♂, SL 2.4 mm, Corneille Island (stn 65), intertidal sand, 19 July 1988, RMNH D 37796; 12 specs, SL 1.8-1.2 mm, Prudhoe Islands (stn 75), intertidal sand, 21.vii.1988, RMNH D 37795; ♂, SL 2.7 mm, 4 ♀♀, SL 2.8-1.9 mm (incl. ovig. ♀), Shirley Island (stn 115), intertidal sand, 26.vii.1988, WAM 2051-88.

Remarks.— Live coloration of Kimberley specimens of *D. avarus* agrees with the notes for Northern Territory animals described by Morgan (1987a). A notable difference from the coloration recorded for east Indonesian specimens by Haig & Ball (1988) is in the pattern on the large cheliped. They recorded the chela as white with carpus and merus solid light brown. On the Australian animals, there is frequently a dark patch, often irregular in outline, on the ventral or lateral face of the palm. Sometimes dark brown is also present on the dactyl and carpus.

Although the most common intertidal hermit crab of the Darwin area (Morgan, 1987a), *D. avarus* appeared consistently outnumbered by and less widespread than *D. gardineri* Alcock in the Kimberleys. *D. avarus* was collected from various small gastropod shells, particularly cerithiid spp. but also including *Nassarius bicallosus* (E.A. Smith), *Turbo foliaceus* Philippi and a fasciolariid spec.

Distribution.— East Africa and Red Sea to Malaysia, Philippines, Indonesia, northern and now recorded from northwestern Australia.

Diogenes biramus Morgan, 1987
(fig. 3)

Diogenes biramus Morgan, 1987a: 177, fig. 2.

Material.— ♂, SL 2.2 mm, 2 ♀♀, SL 2.4, 2.2 mm, Long Reef, west edge (stn 58), to 15 m, coral and coral rubble, 17.vii.1988, WAM 2032-88; 3 ♂♂, SL 4.0, 2.9, 2.8 mm, 2 ♀♀, SL 2.9 (ovig.), 1.8 mm, Shirley Island (stn 115), intertidal coral and sand, 26.vii.1988, WAM 2033-88.

Remarks.— Coloration and most aspects of morphology of the Kimberley material agree with the description by Morgan (1987a). No female was available for consideration in the original description, examination of females collected here indicates but few sexual differences. The large left cheliped of females is slightly stouter and has longer, curved proximomedial spines on the lateral surface of the palm than in males, but otherwise chela morphology is similar (fig. 3a). Female pleopods 1 to 3 are biramous, pleopod 4 uniramous, typical of *Diogenes* species.

However, a major diagnostic character requires revision. The species was diagnosed by Morgan (1987a) as having four obviously biramous pleopods on the male, very atypical for *Diogenes*. Examination of further material indicates that this charac-

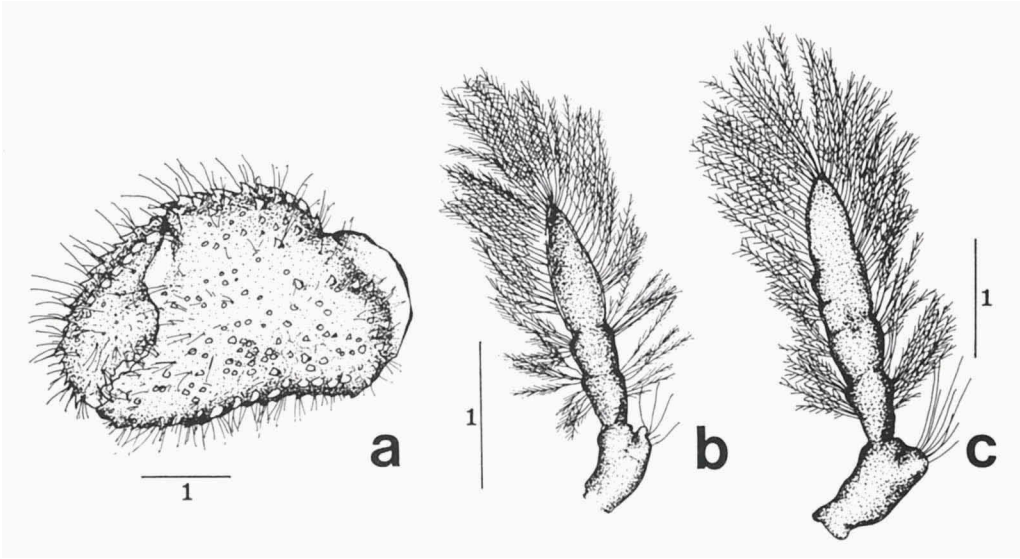

Fig. 3. *Diogenes biramus* Morgan. a, left chela of ♀ SL 2.4 mm (WAM 2032-88) (lateral view); b, second pleopod of ♂ SL 2.9 mm (WAM 2033-88) (mesial view); c, second pleopod of ♂ SL 4.0 mm (WAM 2033-88) (mesial view). Scales = 1.0 mm.

ter is variable. Of the four additional males considered here, three show only very small second rami on the pleopods (fig. 3b) and on the fourth specimen no second ramus can be detected (fig. 3c). This last animal is also the largest specimen examined while the other three are smaller than the holotype, and therefore size variation is not easily proposed as the cause of observed differences. Until a good series of specimens is collected, it must be concluded that there is individual variation in this trait, that careful examination of the male pleopods may be necessary to detect a second ramus and that, in some cases, the ramus may be absent.

D. biramus can still be recognised by its extremely long ocular peduncles, far exceeding the antennular peduncles and lacking a distal brown annulus. In this the species resembles the recently described *D. viridis* Haig & Ball but the latter differs in having the shield as broad as long, lacking proximomedial spines on the outer face of the palm of the left cheliped, in the shape of the telson and possession of strong spines on the carpus and propodus of pereiopod 4 (Haig & Ball, 1988).

Kimberley specimens were collected in shells of *Cerithium novaehollandiae* A. Adams, *Morula spinosa* (H. & A. Adams), *Strombus urceus* Linnaeus and several unidentified shell fragments.

Distribution.— Northern Territory and now known from northwestern Australia.

Diogenes gardineri Alcock, 1905

Diogenes gardineri Alcock, 1905: 73, pl. 7 fig. 3; Forest, 1956b: 530, fig. 16; Lewinsohn, 1969: 45; Ball & Haig, 1972: 91; Morgan, 1987a: 175.

Material.— ♀ (ovig.), SL 1.8 mm, Hall Point (stn 4), intertidal sand, 9.vii.1988, WAM 2045-88; 16 specs, SL 2.4-1.4 mm (incl. 3 ovig. ♀♀), Slate Island (stn 5), intertidal sand, 9.vii.1988, WAM 2043-88; ♂, SL 1.6 mm, 3 juvs, all SL 1.0 mm (approx.), Heywood Islands (stn 11), intertidal sand, 10.vii.1988, WAM 2035-88; 4 ♂♂, SL 1.4-1.1 mm, 5 ♀♀, SL 1.6-1.2 mm, Heywood Islands (stn 12), intertidal sand, 10.vii.1988, WAM 2036-88; 5 ♂♂, SL 1.7-1.6 mm, 2 ♀♀ (ovig.), SL 1.8, 1.6 mm, Heywood Islands (stn 14), mangal, sand, 10.vii.1988, RMNH D 37799; 26 specs, SL 2.2-1.0 mm, Jackson Island (stn 24), intertidal sand, 11.vii.1988, WAM 2042-88; 17 specs, SL 2.2-1.1 mm (incl. 6 ovig. ♀♀), Bernouilli Island (stn 30), intertidal sand, 12 July 1988, RMNH D 37797; ♂, SL 2.3 mm, Coronation Islands (stn 38), mangal, sand, 13.vii.1988, WAM 2041-88; 3 ♂♂, SL 2.6, 2.2, 1.7 mm, 2 ♀♀ (ovig.), SL 2.2, 2.1 mm, Careening Bay (stn 41), intertidal sand, 13.vii.1988, RMNH D 37798; 28 specs, SL 1.7-1.2 mm (incl. 4 ovig. ♀♀), Corneille Island (stn 65), mangal and rocks, 19.vii.1988, WAM 73-89; 10 specs, SL 1.6-1.1 mm (incl. ovig. ♀), Descartes Island (stn 71), intertidal sand, 20.vii.1988, WAM 82-89; 13 specs, SL 1.7-1.1 mm (incl. 2 ovig. ♀♀), Prudhoe Islands (stn 75), intertidal rocks and sand, 21.vii.1988, WAM 72-89; 10 specs, SL 3.1-1.6 mm, Hunter River estuary (stn 81), intertidal mud-sand, 22.vii.1988, WAM 2044-88; 23 specs, SL 2.1-1.1 mm (incl. 7 ovig. ♀♀), Shirley Island (stn 115), intertidal sand, 26.vii.1988, WAM 2034-88.

Remarks.— Coloration of Kimberley specimens was similar to that of Northern Territory animals described by Morgan (1987a). The relationships of *D. gardineri* have been discussed by Forest (1956b), Lewinsohn (1969) and Morgan (1987a).

The species is the most common hermit crab in the Kimberley region, inhabiting intertidal sand flats, often near mangroves, and rock platforms especially when coated with some sand. *D. gardineri* is frequently sympatric with *D. avarus*. It would be interesting to determine the mechanism of niche separation whereby the two similar species can coexist.

Commonly utilised shells were a variety of cerithiids including *Cerithium novaehollandiae* A. Adams and *Clypeomorus* cf. *batillariaeformis* Habe & Kosuge, *Morula margariticola* (Broderip), *Trochus histrio* Reeve, *Peristernia nassatula* (Lamarck), *Calliostoma* cf. *rubriginosa* Valenciennes and a costellariid and columbellid spec.

Distribution.— East Africa and Red Sea, New Guinea, east to Tuamotu Islands, northern and northwestern Australia.

Diogenes serenei Forest, 1956b

Diogenes serenei Forest, 1956b: 530, figs. 12-15; Ball & Haig, 1972: 91; Morgan, 1987a: 176; Haig & Ball, 1988: 168.

Material.— ♀, SL 1.4 mm, Slate Island (stn 5), intertidal rocks and sand, 9.vii.1988, WAM 2047-88; ♂, SL 1.4 mm, Wildcat Reefs (stn 21), 7-22 m, limestone and coral, 11.vii.1988, WAM 2029-88; 3 ♂♂, SL 3.0, 2.6, 1.6 mm, ♀, SL 2.4 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, WAM 2049-88; ♂, SL 1.2 mm, Condillac Island (stn 54a), intertidal, sand, 16.vii.1988, WAM 934-88; 2 ♂♂, SL 1.8 (both), Fenelon Island (stn 55), intertidal rock platform with pools, 17.vii.1988, RMNH D 37802; ♂, SL 2.3 mm, Long Reef, southwestern edge (stn 60), to 15 m, coral and rubble, 18.vii.1988, WAM 78-89; ♂, SL 1.4 mm, Fenelon Island (stn 64), 7-8 m, sand and coral, 18.vii.1988, WAM 75-89; 2 juvs, SL 1.1 mm (both), Lafontaine Island (stn 68), 5 m, sand and rubble, 19.vii.1988, WAM 77-89; ♂, SL 1.4 mm, ♀ (ovig.), SL 2.7 mm, Descartes Island (stn 71), intertidal sand and rocks, 20.vii.1988, RMNH D 37801; 9 specs, SL 2.5-0.9 mm, west of Buffon Island (stn 85), 3-22 m, sand, rubble and coral, 23.vii.1988, RMNH D 37800; 2 ♂♂, SL 3.0, 1.2 mm, 2 ♀♀, SL 3.5, 1.4 mm, Lucas Island (stn 101), 3-29 m, sand, silt, some coral and rock, 24.vii.1988, WAM 80-89; 10 specs, SL 3.7-1.6 mm, east of Heywood Island (stn 102), 3-4 m, limestone and sand, 24.vii.1988, WAM 2048-88; ♂, SL 2.9 mm, Shirley Island (stn 115), intertidal, 26.vii.1988, WAM 2046-88.

Remarks.— Morphology, coloration and relationships of *D. serenei* have been discussed by the above authors. In the Kimberley material, the ventral secondary spine on the rostral process appears to be a good diagnostic character and the distal brown annuli on the ocular peduncles were apparent even on specimens too small to clearly distinguish the rostral spine. As in most hermit crabs, and particularly in the genus *Diogenes*, allometric variation is pronounced and small specimens show shorter, stouter ocular peduncles than those illustrated for an adult animal by Forest (1956b).

Kimberley specimens inhabited shells of several cerithiid species, mostly unidentified but including *Cerithium novaehollandiae* A. Adams. *Strombus vittatus* Linnaeus and a variety of small often damaged, shells were also utilised.

Distribution.— Gulf of Iran, Vietnam, New Guinea, Indonesia, north and northwestern Australia.

Paguristes alegrias Morgan, 1987

Paguristes alegrias Morgan, 1987a: 168, fig. 1.

Material.— ♂, SL 4.2 mm, ♀, SL 3.7 mm, Slate Island (stn 5), intertidal rock platform, 9.vii.1988, RMNH D 37781; ♂, SL 3.1 mm, Wildcat Reefs (stn 21), 7-22 m, limestone and coral, 11.vii.1988, WAM 2059-88; ♂, SL 5.8 mm, 5 ♀♀ (all ovig.), SL 5.0-3.6 mm, Bernouilli Island (stn 30), intertidal rock platform with some live coral, 12.vii.1988, WAM 2067-88; ♂, SL 4.5 mm, 2 ♀♀ (ovig.), SL 6.0, 5.4 mm, Careening Bay (stn 41), intertidal rock platform, 13.vii.1988, RMNH D 37782; ♂, SL 6.0 mm, ♀ (ovig.), SL 5.5 mm, Albert Island (stn 43), intertidal rocks and coral, 14.vii.1988, RMNH D 37783; ♀, SL 3.5 mm, East Montalivet Island (stn 50a), intertidal rocks on sand, 15.vii.1988, WAM 2069-88; 5 ♂♂, SL 4.8-3.7 mm, 10 ♀♀, SL 4.5-2.2 mm (7 ovig.), Don Island (stn 50b), 8 m, sand and coral with rubble, 16.vii.1988, WAM 938-88; ♀, SL 3.4 mm, Condillac Island (stn 54a), intertidal rocks, 16.vii.1988, WAM 939-88; ♂, SL 3.5 mm, Condillac Island (stn 54b), 10 m, sand and coral, 16.vii.1988, WAM 2068-88; ♂, SL 2.9 mm, Fenelon Island (stn 55), intertidal limestone platform with pools, 17.vii.1988, WAM 2065-88; ♂, SL 8.9 mm, ♀ (ovig.), SL 5.5 mm, Long Reef, west edge (stn 58), to 15 m, coral and rock, 17.vii.1988, RMNH D 37778; 2 ♂♂, SL 5.1, 4.5 mm, Cassini Island (stn 59), intertidal rocks and coral, 18.vii.1988, WAM 2064-88; ♂, SL 4.5 mm, 2 ♀♀, SL 4.6, 3.6 mm, Fenelon Island (stn 64), 7-8 m, sand and coral, 18.vii.1988, WAM 92-89; 3 ♂♂, SL 7.0, 6.4, 3.8 mm, west of Buffon Island (stn 85), 3-22 m, rocks and corals, 23.vii.1988, WAM 91-89; 13 specs, SL 7.6-3.7 mm (incl. 3 ovig. ♀♀), Irvine Island (stn 108), intertidal coral, 25.vii.1988, WAM 2061-88; ♂, SL 6.2 mm, Shirley Island (stn 115), intertidal sand and coral, 26.vii.1988, WAM 2066-88.

Remarks.— A very common hermit crab in the Kimberley region, *P. alegrias* inhabits intertidal and subtidal coral and rocky reef areas.

A wide variety of shells was utilised for shelter including *Morula margariticola* (Broderip), *M. spinosa* (H. & A. Adams), *Turbo foliaceus* Philippi, *Cerithium echinatum* Lamarck, *C. novaehollandiae* A. Adams, *Rhinoclavis brettinghami* Cernohorsky, *Astralium rotularia* (Lamarck), *Tectus fenestratus* Gmelin, *Cronia avellana* (Reeve), *Trochus hanleyanus* Reeve, *Thais kieneri* (Deshayes) and a *Strombus* spec.

Ovigerous females bear large eggs, numbering 15-70 on 9 females for which counts were taken. One specimen from stn 30 (WAM 2067-88) carries hatched juveniles on the pleopods, indicating a form of abbreviated development. Direct developing juveniles have been recorded for other species of *Paguristes* e.g. *P. abbreviatus* Dechancé (see Dechancé, 1963) and *P. frontalis* (H. Milne Edwards) (see Morgan, 1987c) and a number of other species are known to carry few, large eggs implying

abbreviated development (e.g. *P. monoporus*, Morgan, 1987b, this paper).

Distribution.— Northern Territory and now extended to northwestern Australia.

Paguristes monoporus Morgan, 1987

Paguristes monoporus Morgan, 1987b: 379, figs. 1-3; Haig & Ball, 1988: 173.

Material.— ♂, SL 2.5 mm, ♀ (ovig.), SL 2.9 mm, Wildcat Reefs (stn 21), 7-22 m, limestone and corals, 11.vii.1988, WAM 2058-88; ♂, SL 2.6 mm, 3 ♀♀, SL 2.7 (ovig.), 2.4, 2.3 mm (ovig.), Albert Island (stn 43), intertidal corals and rocks, 14.vii.1988, WAM 2056-88; ♀ (ovig.), SL 3.1 mm, Rob Roy Reef (stn 49), 8-31 m, corals, 15.vii.1988, WAM 2057-88; ♀, SL 1.5 mm, Don Island (stn 50b), 8 m, sand, coral and rubble, 16.vii.1988, WAM 937-88; ♀, SL 1.8 mm, Condillac Island (stn 54b), 10 m, sand and coral, 16.vii.1988, WAM 2054-88; 2 ♂♂, SL 3.1, 2.7 mm, 2 ♀♀, SL 2.6, 2.0 mm (ovig.), Cassini Island (stn 59), intertidal rocks and coral, 18.vii.1988, RMNH D 37785; 2 ♂♂, SL 2.3, 2.2 mm, ♀ (ovig.), SL 2.3 mm, Long Reef, southwest edge (stn 60), to 15 m, coral and rubble, 18.vii.1988, RMNH D 37786; 2 ♂♂, SL 3.8, 3.4 mm, ♀, SL 3.1 mm, Fenelon Island (stn 64), 7-8 m, sand and coral, 18.vii.1988, RMNH D 37784; ♂, SL 1.8 mm, ♀, SL 2.3 mm, Lafontaine Island (stn 68), 5-24 m, sand and silt, coral rubble, 19.vii.1988, WAM 86-89; 13 specs, SL 2.8-2.0 mm, west of Buffon Island (stn 85), 3-22 m, sand, rocks, coral, 23.vii.1988, WAM 85-89.

Remarks.— Morphology and coloration of the species were described by Morgan (1987b), with further discussion of its relationships in Haig & Ball (1988). As noted by the latter authors, Australian records of *P. hians* Henderson (e.g. Grant & McCulloch, 1906; McCulloch, 1913) refer to *P. monoporus*.

A relatively common species in the Kimberleys, usually associated with living coral or coral rubble, *P. monoporus* was collected from shells of *Cronia avellana* (Reeve), *Cerithium novaehollandiae* A. Adams, *Morula spinosa* (H. & A. Adams), *Peristernia incarnata* (Deshayes), at least one *Conus* spec., a turrid cf. small *Xenoturris angulifera* (Lamarck) and one specimen was found in a length of serpulid polychaete tube. Many inhabited shells were too heavily encrusted with coralline algae to permit identification.

Ovigerous females carry low numbers (15-71) of relatively large eggs, suggesting some degree of abbreviated development as proposed by Morgan (1987b) (see also *Paguristes alegrias*, this paper).

Distribution.— Known from southeastern Indonesia, New Guinea and northern Australia from the Kimberleys to central coastal Queensland.

Trizopagurus strigatus (Herbst, 1804)

Cancer strigatus Herbst, 1804: 25, pl. 61 fig. 3.
Pagurus strigatus; Olivier, 1811: 647.
Pagurus annulipes H. Milne Edwards, 1848: 63.
Aniculus strigatus; Alcock, 1905: 97, pl. 7 fig. 4.
Trizopagurus strigatus; Forest, 1952a: 2; Forest, 1952b: 6, figs. 5, 14, 21; Lewinsohn, 1969: 52, fig. 7; Ball & Haig, 1972: 94; Haig & Ball, 1988: 177.

Material.— ♂, SL 6.3 mm, Rob Roy Reef (stn 49), to 31 m, 15.vii.1988, WAM 925-88.

Remarks.— The live colours (Ball & Haig, 1972; Haig & Ball, 1988) of this extremely vivid species permit its easy identification in the field. The dorsoventrally flattened body is well suited to habitation of narrow-aperture shells; the single specimen collected in the Kimberleys inhabited a shell of *Conus capitaneus* Linnaeus.

Distribution.— Red Sea and East Africa, to India, Indonesia, New Guinea, Hawaiian and Society Islands; now recorded from northwestern Australia.

Paguridae Latreille, 1803
Pagurixus cf. *boninensis* (Melin, 1939)

Eupagurus (*Pagurixus*) *boninensis* Melin, 1939: 38, figs. 16-19.
Pagurus (*Pagurixus*) *boninensis*; Gordan, 1956: 327; Ball & Haig, 1972: 103.
Pagurixus boninensis; Ooishi, 1970: 90, pl. 12 fig. 13; McLaughlin & Haig, 1984: 124, fig. 1.
Pagurus boninensis; Miyake, 1978: 79 (key).

Material.— ♂, SL 2.8 mm, Long Reef (stn 58), to 15 m, coral, sand and silt, 17.vii.1988, WAM 2112-88.

Coloration (in life).— Shield with very pale orange-green stippling on cream. Ocular peduncles cream with small darker patch distomesially; corneas black and gold. Antennular peduncles with penultimate segment distally cream, green stripes at midlength; ultimate segment and flagella pale green-brown. Antennal peduncles pale green-brown, ultimate segment with darker lateral lines; flagella orange. Chelipeds with dactyl cream; propodus with finger cream, grading to very pale orange-green on palm; carpus pale orange-green; merus cream with dark orange-brown distal band, paler orange-green subdistal band and indistinct subproximal band. Pereiopods 2 and 3 with dactyl, propodus and carpus pale orange-green; merus cream with distal, midlength and subproximal pale green-brown bands.

Remarks.— This specimen lacks the large right cheliped and identification is consequently less than certain. The animal keys in McLaughlin & Haig (1984) to *P. boninensis*, and agrees quite well with their diagnosis. They did not describe live coloration.

One character that differs from their description and figure of *P. boninensis* is the shape and spination of the telson. On this specimen, telsonic lobes are more rounded and bear only minute posterior spinules. It cannot be decided here whether these differences are specific or variation within the species. McLaughlin & Haig (1984) observed that Lewinsohn's (1969) redescription of *P. boninensis* in fact refers to *P. anceps* (Forest).

Distribution.— Marshall, Ogasawara and Maldive Islands; if conspecific, range now extended to northwestern Australia.

Pagurus boriaustraliensis spec. nov.
(fig. 4)

Pagurus sp. A Morgan, 1987a: 183.

Material.— Holotype: ♂, SL 5.1 mm, Rob Roy Reef (stn 49), 8-31 m, coral and coral rubble, 15.vii.1988, WAM 927-88.— Paratypes: ♀, SL 2.3 mm, type locality, WAM 209-89; 14 specs, SL 3.5-1.9 mm (incl. 3

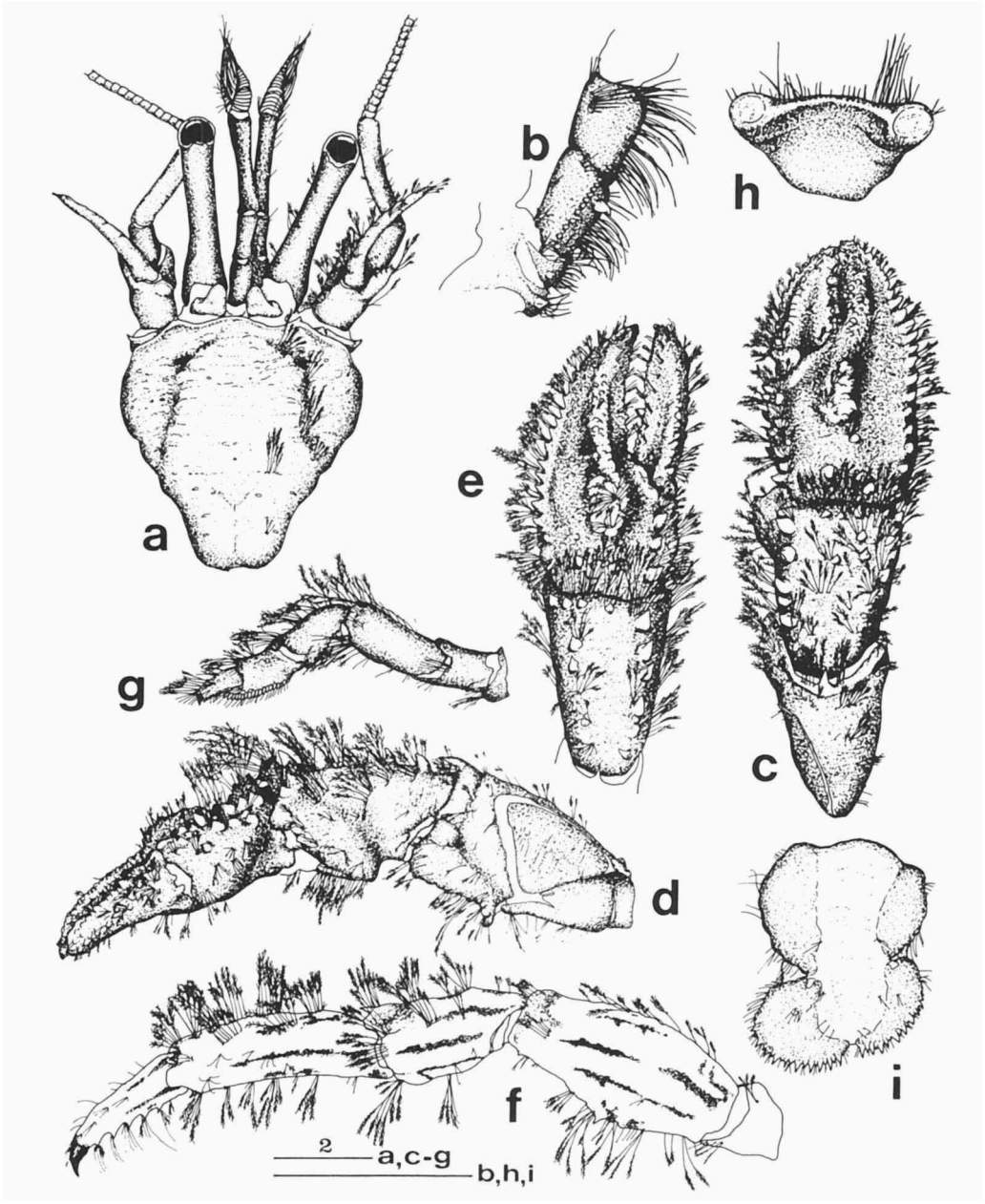

Fig. 4. *Pagurus boriaustraliensis* sp. nov., holotype ♂. a, shield and cephalic appendages (dorsal view) (setae omitted left side); b, basis, ischium and merus of endopod of third maxilliped (mesial view); c, right cheliped (dorsal view); d, right cheliped (mesial view); e, left cheliped (dorsal view); f, left second pereiopod (lateral view); g, left fourth pereiopod (lateral view); h, sternite of fifth pereiopods; i, telson (dorsal view). Scales = 2.0 mm.

ovig. ♀♀), west of Buffon Island (stn 85), 3-22 m, coral and rubble, 23.vii.1988, WAM 107-89(12), RMNH D 38341(2).

Description.— Shield (fig. 4a) very slightly longer than broad; anterolateral margins terraced. Rostrum very obtusely triangular, slightly less pronounced than lateral projections; anterior margin between rostrum and lateral projections concave; lateral projections triangular, tipped by distinct spinule. Shield with scattered clumps of long plumose setae.

Ocular peduncles elongate, slightly shorter than front of shield, about 2/3 length of shield, inflated basally, less so distally; sparsely setose. Ocular acicles large, anterolateral edge sinuous or concave, tipped with pronounced spine slightly offset ventrally, separated basally by about 1/2 width of one acicle.

Antennular peduncles slightly longer than ocular peduncles; segments unarmed except for distoventral spine on basal segment. Antennal peduncles about same length as antennular peduncles. Fifth (ultimate), fourth and third segments unarmed; second segment with one large distal spine and two or three spines proximomesial to this, spines decreasing in size proximally; first segment with distinct distolateral spine; segments bearing scattered plumose setae. Acicle reaching to half length of ultimate peduncular segment, tipped with strong spine; mesial margin setose. Flagellum longer than thorax, articles with minute distal setae.

Third maxilliped (fig. 4b) with dactyl, propodus, carpus and merus unarmed; basis-ischium fusion apparently incomplete; ischium with well developed crista dentata and one large accessory tooth; basis with one or two mesial spines; coxa with larger mesial spine.

Right cheliped of holotype (fig. 4c, d) similar length to and only slightly broader than left, distinctly larger than left in smaller specimens. Dactyl as long as palm, slightly deflexed, mesial margin strongly curved; tip slightly overlapped by propodus; cutting edge with four or five large teeth; dorsal surface with pronounced proximomesial spines diminishing in size to blunt granules in ridge almost reaching distal tip of dactyl, plumose setae heavy on proximal part of ridge obscuring some spines and granules; dorsal surface between ridge and margins of dactyl rather smooth or with scattered low granules; mesial margin with row of spines supporting long plumose setae; ventral surface almost smooth. Fixed finger slightly deflexed, lateral margin strongly curved; cutting edge with large subdistal and several smaller teeth; dorsal surface with pronounced granular ridge extending from tip back along finger and onto palm, granules becoming supplanted by spines on palm, ridge with obvious hiatus lacking spines subproximally then several spines at proximal margin of palm; ridge with usually long, plumose setae on palm but almost asetose on finger; lateral margin of finger and dorsolateral margin of palm with row of spines, these spines curving semi- perpendicular from propodus and fringed with long plumose setae; dorsomesial margin of palm with irregular row of spines and some scattered spines ventral to this; dorsal surface of fixed finger and palm between dorsal ridge and margins smooth or lightly granular; propodus smooth ventrally. Carpus as long as or slightly longer than palm; dorsomesial, dorsolateral and distal margins with row of spines, mesial spines larger than lateral; dorsal surface between spine rows flattened but with scattered spines; plumose setae dorsally and along margins; mesial face smooth, ventromesial margin produced in flattened crest, edge of crest unarmed or with several tubercles or low spines distally; lateral and ventral surfaces of carpus smooth. Merus approximately length of carpus, subtriangular; large distodorsal spine and several smaller spines or spinules distoventrally on lateral

margin; very pronounced flattened crest ventromesially, edge of crest with irregularly sized spines or tubercles, one particularly large tubercle usually present proximoventrally; lateral and mesial faces smooth. Male and female chelipeds similar.

Left cheliped of holotype (fig. 4e) slightly more elongate than right; in smaller specimens left cheliped distinctly shorter and less robust. Dactyl slightly to conspicuously longer than palm and much more elongate than on right chela; cutting edge with numerous small teeth; dorsal surface smooth or lightly granular except for row of large spines proximally diminishing in ridge along finger to low granules; mesial margin with low spines or tubercles in irregular row that merges proximally with dorsomesial row; mesial margin and dorsomesial ridge bearing long plumose setae; dactyl almost smooth ventrally. Fixed finger deflexed, lateral margin less strongly curved than on right chela; cutting edge with numerous teeth, largest proximally; dorsal surface smooth or weakly granular with granular ridge extending from finger tip proximally onto palm and, as on right chela, terminating subproximally and separated by smooth hiatus from several spines or tubercles medially near articulation with carpus; lateral margin of finger and palm with row of spines, spines largest at midlength; dorsomesial margin of palm with row of spines, sometimes with scattered spines ventral to this; long plumose setae along lateral margin and proximally on medial ridge; ventral surface of propodus smooth. Carpus longer than palm; dorsal surface flattened; dorsomesial margin with row of large spines and irregular row of spines on dorsal surface just mesial to lateral margin; lateral margin unarmed or with low granules; distal margin spinose; ventromesial margin not produced into crest although distal carpus rather inflated; dorsal distomesial angle with one or more spines; mesial, lateral and ventral surfaces of carpus almost smooth; long plumose setae scattered over surface but especially along distal margin. Merus subtriangular; pronounced distodorsal spine and several spines or spinules along ventromesial and ventrolateral margins; larger spine or tubercle proximally on ventromesial margin; lateral and mesial surfaces almost smooth.

Second pereiopods (fig. 4f) longer than chelipeds. Dactyl shorter than propodus, straight in lateral view and only slightly twisted in dorsal view; terminating in strong corneous claw; ventral margin with five or six corneous spines, largest distally. Propodus longer than carpus, with several ventromesial corneous spines, largest distally. Carpus about 3/4 length of merus, with strong distodorsal spine. Merus laterally compressed, spine or spinule at distolateral angle and one or more spines along ventral margin. All segments with plumose setae, especially along dorsal and ventral margins.

Third pereiopods similar to second except distodorsal carpal spine and ventral meral spines smaller.

Fourth pereiopods (fig. 4g) lacking preungual process; propodal rasp with single row of scales.

Sternite of third pereiopods with anterior lobe subrectangular, much broader than long, centrally produced and bearing long simple setae. Sternite of fifth pereiopods (fig. 4h) with anterolateral angles weakly produced and symmetrical.

Male with three unpaired pleopods, endopod rudimentary; female with four unpaired pleopods, endopod larger than exopod on pleopods 1 and 2, smaller on pleopod 3 and rudimentary on pleopod 4.

Telson (fig. 4i) with left posterior lobe larger and more rounded than right; lobes

separated by deep median cleft; terminal and lateral margins with numerous alternating large and small spines; anterior lobes unarmed.

Coloration (in life).— Shield cream or pale brown with dark brown mottling especially sublaterally and just posterior to frontal margin. Ocular peduncles cream with short longitudinal stripes distally (about 3 stripes) and subproximally (about 5 stripes); ocular acicles cream and brown; corneas black with pale flecks. Antennular peduncles with penultimate segment cream with distodorsal and ventral dark stripe; ultimate segment cream; flagellum bright orange. Antennal peduncles cream with dark flecks; ultimate segment with dark lines laterally; flagellum cream with dark brown bands, bands increasing in length distally. Chelipeds cream-brown with dark brown lines; dactyl with some short lines proximomesially; propodus with four irregular lines laterally and ventrally (lateral two most distinct) and more diffuse brown area mesially; carpus with two lateral and two mesial lines, several less distinct proximodorsal stripes/flecks and irregular dark flecks ventrally; merus with several distal and proximal bands. Pereiopods 2 and 3 with dactyl bearing brown band subdistally and two lateral and two mesial dark proximal stripes; propodus with subdistal brown patches dorsally and ventrally, almost forming lines, and one dorsal, one lateral, one short ventral and three mesial stripes; carpus and merus similar to propodus; background colours of propodus, carpus and merus slightly darker around midline under stripes.

Etymology.— Named from the Greek for "northern" and new Latin for "Australia".

Remarks.— *P. boriaustraliensis* was collected previously from the Northern Territory but insufficient material prevented its identification or description (Morgan, 1987a). The species most closely resembles *P. hedleyi* (Grant & McCulloch), *P. kulkarnii* Sankolli, *P. conformis* De Haan, *P. triserratus* (Ortmann) and possibly *P. acantholepis* (Stimpson).

P. hedleyi and *P. kulkarnii* share with *P. boriaustraliensis* the pronounced ventromesial crests on the merus and carpus of the right cheliped, the obsolescent rostrum, the shape of ocular and antennal peduncles, shape and spination of the telson and the single row of scales on the propodal rasp of pereiopod 4 (Sankolli, 1962: Haig & Ball, 1988). *P. boriaustraliensis* can be recognised by the very distinct dorsomedial crest of low spines and plumose setae on the palm of the right cheliped and in its coloration. The latter most closely resembles that of *P. kulkarnii* but the species are readily distinguished by the respective colours of the ocular peduncles (Morgan, 1987a; this paper).

P. conformis as keyed and described in Ortmann (1892) and Miyake (1978) resembles *P. boriaustraliensis* in the shape of the rostrum and ocular peduncles and in the medial crest on the right chela but differs in having the dactyls of pereiopods long and thin, exceeding the propodi in length, and multispinose ocular acicles.

P. triserratus also bears a distinct medial crest on the right palm but this chela is almost devoid of setae, the dactyls of pereiopods are as long as or longer than the propodi and the rostrum is more pronounced. As illustrated by Ortmann (1892: pl. 12 fig. 15), the antennal flagella are extremely short.

P. acantholepis has not been illustrated and the description by Stimpson (1858: 251) is very brief. Spinules on the chelipeds are triseriate, probably similar to the pattern of *P. boriaustraliensis*. The ocular peduncles are longer than the antennal pedun-

cles, however, and the ocular squamulae (presumably ocular acicles) are bidentate.

P. boriaustraliensis was collected from shells of *Morula spinosa* (H. & A. Adams), *Peristernia incarnata* (Deshayes) and several small unidentified species. The species occurs in shallow sublittoral habitats, associated with sand and coral.

Distribution.— Known only from northern and northwestern Australia.

Pagurus kulkarnii Sankolli, 1962

Pagurus kulkarnii Sankolli, 1962: 136, figs. 1, 2; Morgan, 1987a: 182; Haig & Ball, 1988: 185.

Material.— ♂, SL 3.0 mm, Slate Island (stn 5), intertidal rocks and sand, 9.vii.1988, WAM 2110-88; ♀, SL 3.4 mm, Bernouilli Island (stn 30), intertidal rocks and coral, 12.vii.1988, WAM 2108-88; ♂, SL 4.0 mm, Albert Island (stn 43), intertidal rocks and coral, 14.vii.1988, WAM 2109-88; ♀, SL 2.7 mm, Fenelon Island (stn 64), 7-8 m, sand and coral, 18.vii.1988, WAM 105-89; ♂, SL 3.1 mm, ♀ (ovig.), SL 3.4 mm, east of Heywood Island (stn 102), 3-4 m, coral and limestone, 24.vii.1988, RMNH D 37772.

Coloration (in life).— As per Morgan (1987a), with the following comments: grey-blue areas and brown stripes can be tinged strongly with dark green; may be thin cream line between central blue band and distal orange band on ocular peduncles; proximal part of penultimate segment of antennular peduncle can be cream; brown bands on antennal flagella notably increase in length distally; dactyl of larger chela with pale subdistal brown band and often proximal dark lines; propodus of larger chela with subdistal band on finger and usually dark lines dorsally, laterally and ventrally; stripes on pereiopods 2 and 3 on both lateral and mesial surfaces.

Remarks.— The close similarity of *P. kulkarnii* and *P. hedleyi* has been discussed at some length by Sankolli (1962), Morgan (1987a) and Haig & Ball (1988). The former species has been recorded previously from the Northern Territory, the latter from the Arafura Sea and Queensland south to Port Curtis. As observed by Haig & Ball (1988), the two species are best separated by respective colours. To this end, the colour notes in Morgan (1987a) for Northern Territory animals are slightly augmented above. Some differences are apparent between these specimens and the types illustrated by Sankolli (1962). Sankolli showed no evidence of dark striping on the larger chela and the second and third pereiopods are shown with only two stripes visible from (apparently) mesial view on the merus, carpus, propodus and dactyl. A shorter ventral stripe is also apparent both laterally and mesially on all segments except the dactyl of most of the Kimberley specimens. Sankolli did not record the distinctive blue and orange coloration of the ocular peduncles; the blue and orange colour of the antennular peduncles is shared with *P. hedleyi* (Haig & Ball, 1988).

The species was collected from shells of *Cerithium novaehollandiae* A. Adams, *Cronia avellana* (Reeve) and *Morula margariticola* (Broderip).

Distribution.— India, northern and now recorded from northwestern Australia.

Pagurus spec.

Material.— ♀ (ovig.), SL 1.6 mm, Don Island (stn 50b), 8 m, sand and coral, 16.vii.1988, WAM 934-88; ♀ (ovig), SL 1.7 mm, Cassini Island (stn 59), intertidal rocks and coral, 18.vii.1988, WAM 2111-88; 2 ♂♂, SL 1.8, 1.7 mm, Fenelon Island (stn 64), 7-8 m, sand, coral, 18.vii.1988, WAM 106-89.

Remarks.— This species of *Pagurus*, represented here by four small specimens, could not be identified. The coloration resembled that of *P. boriaustraliensis* but ocular peduncles are much shorter than antennular peduncles, chelae are gradually convex dorsally with only a few scattered spines and lack a granular ridge, and setae are simple. Female maturity obviously is attained at a small size. Confident identification of the species must await collection of further specimens.

Porcellanidae Haworth, 1825
Aliaporcellana suluensis (Dana, 1852)

Porcellana suluensis Dana, 1852b: 414; Dana, 1855: pl. 26 fig. 4; Rathbun, 1924: 30, pl. 1 figs. 15, 16.
Polyonyx denticulatus Paulson, 1875: 32, pl. 1 fig. 11 (nom. nud.).
Polyonyx hexagonalis Zehntner, 1894: 187, pl. 8 fig 18, 18a.
Polyonyx suluensis; Haig, 1964: 373, fig. 3; Haig, 1965: 112; McNeill, 1968: 37; Lewinsohn, 1969: 166, fig. 37.
Aliaporcellana suluensis; Nakasone & Miyake, 1969: 21, fig. 1; Haig, 1972: 447; Haig, 1973: 285; Haig, 1983: 285.

Material.— ♂, 2.8x2.9 mm, ♀ (ovig.), 4.2x4.7 mm, Condillac Island (stn 54b), 10 m, sand and coral, 16.vii.1988, WAM 69-89.

Remarks.— The species has been well redescribed and figured by Haig (1964: fig. 3; 1965), Lewinsohn (1969: fig. 37) and Nakasone & Miyake (1969: fig. 1). The genus *Aliaporcellana* was erected by Nakasone and Miyake (1969) and as restricted by Haig (1978) contains two Western Australian species previously accorded by Haig (1965) to the genus *Polyonyx* Stimpson (*A. suluensis* and *A. telestophila* (Johnson)).

Distribution.— Red Sea east to Malaysia, Indonesia, Palau Islands, northwestern Australia and Queensland.

Ancylocheles gravelei (Sankolli, 1963)

Porcellana gravelei Sankolli, 1963: 280, fig. 1; Haig, 1965: 108; Haig, 1972: 447.
Ancylocheles gravelei; Haig, 1978: 710; Haig, 1981: 275.

Material.— ♀, 2.9x2.8 mm, Albert Island (stn 43), intertidal, 14.vii.1988, WAM 58-59; 2 ♀♀, 3.2x3.1, 3.1x3.0 mm, Long Reef, western edge (stn 58), to 15 m, limestone, coral, rubble, 17.vii.1988, WAM 57-89.

Remarks.— Specimens agree with Haig's (1965) diagnosis of north Australian specimens, with the exception that lateral margins of the carapace may bear more than three spinules, up to five on these animals.

Distribution.— India, Gulf of Mannar, Australia from Esperance in the southwest north and east to New South Wales.

Lissoporcellana spinuligera (Dana, 1852)

Porcellana armata Dana, 1852b: 426 (not *Porcellana armata* Gibbes, 1850).

Porcellana spinuligera Dana, 1852c: 1593; Dana, 1855: pl. 26 fig. 14.
Porcellana latifrons Stimpson, 1858: 243; Stimpson, 1907: 190, pl. 23 fig. 4; Rathbun, 1924: 31.
Porcellana danae Heller, 1865: 74.
Petrolisthes helleri Kingsley, 1880: 405 (footnote).
Pisidia spinuligera; Haig, 1960: 208; Haig, 1965: 105; Haig, 1972: 447.
Lissoporcellana spinuligera; Haig, 1978: 712; Haig, 1981: 281.

Material.— 2 ♂♂, 4.6x4.0, 4.2x3.7 mm, 3 ♀♀, 4.2x3.8, 3.7x3.3, 3.4x3.0 mm, Rob Roy Reef (stn 49), 8-9 m, coral and limestone platform, 15.vii.1988, WAM 928-88; 6 ♂♂, 4.4x4.1-3.6x3.2 mm, 7 ♀♀, 4.4x4.1-3.2x3.0 mm (incl. 4 ovig. ♀♀), Don Island (stn 50b), 8 m, sand, coral, coral rubble, 16.vii.1988, WAM 932-88; 2 ♂♂, 3.4x2.9 mm (both), 4 ♀♀, 3.5x3.1-3.1x2.6 mm (incl. 2 ovig. ♀♀), Condillac Island (stn 54b), to 10 m, sand and coral, 16.vii.1988, WAM 52-89; 77 specs, 5.1x4.2-2.1x1.7 mm, Long Reef, west edge (stn 58), to 15 m, coral, 17.vii.1988, WAM 53-89; ♂, 4.2x3.7 mm, ♀, 3.7x3.2 mm, Cassini Island (stn 59), intertidal rocks and coral, 18.vii.1988, WAM 54-89; 9 specs, 4.6x4.0-2.6x2.2 mm, Long Reef, southwest edge (stn 60), to 15 m, coral and rubble, 18.vii.1988, RMNH D 37810; 3 ♂♂, 4.2x3.7, 3.5x3.1, 2.8x2.5 mm, ♀ (ovig.), 4.5x4.1 mm, Fenelon Island (stn 64), 7-8 m, sand and coral, 18.vii.1988, RMNH D 37809.

Remarks.— Kimberley specimens agree well with previous descriptions of the species (e.g. Dana, 1852b; Stimpson, 1907; Haig, 1965) with some minor qualifications. The median frontal lobe is described as quadridentate and the lateral lobes as bidentate, resulting in the "entire front thus consisting of eight small subequally projecting pointed teeth" (Haig, 1965: 106). On many of the Kimberley animals the lateral lobes bear two or three prominent distal spines and frequently one or two smaller spines between the lateral and median lobes. The median frontal lobes not infrequently carry three spines. There are many intergrades and individual variations and no specific separation from *L. spinuligera* is warranted. Live coloration of the species is distinctive, particularly the red spot or longitudinal band on the dorsal margin of the dactyl of chelipeds and the red-orange stripes on the propodus of ambulatory legs (Haig, 1965). One large male (4.6x4.0 mm) displays an aberrant condition of spination on the inner edge of the carpus of the left cheliped (right cheliped is missing). Typically the species has three or four spines on this margin, while on this specimen spines are absent, the edge being sinuous. Otherwise, it is typical of the species. One female at stn 50b (WAM 932-88) carried hatched larvae in the prezoeal stage under her abdomen.

L. spinuligera was very abundant under subtidal, sometimes intertidal, coral slabs and rubble.

The genus *Lissoporcellana* was erected by Haig (1978) and contains two other species recorded from Western Australia: *L. furcillata* (Haig) and *L. nitida* (Haswell).

Distribution.— Indonesia, Hong Kong, Palau and Ryukyu Islands, northwestern Australia as far south as Houtman Abrolhos Islands.

Pachycheles johnsoni Haig, 1965

Pachycheles johnsoni Haig, 1965: 102, fig. 1; Haig, 1987: 11.

Material.— ♂, 2.3x2.4 mm, Long Reef, western edge (stn 58), to 15 m, coral and rubble, 17.vii.1988, WAM 70-89.

Coloration (in life).— Carapace bright red-orange with median white longitudi-

nal stripe, widest posteriorly. Chelipeds orange with white bands distally on carpus and proximally on propodus, and finger tips white. Walking legs banded orange and white.

Remarks.— The one small Kimberley specimen agrees reasonably well with the species description in Haig (1965). The animal was also compared with specimens identified by J. Haig in the WAM collection.

P. johnsoni closely resembles *P. sculptus* (H. Milne Edwards), a widespread species in the Indo-West Pacific. Haig (1965) compared the two species in some detail. Distinction is based primarily upon the shape and arrangement of the tubercles on the chelipeds and the sculpturing of the anterior portion of the carapace. The present specimen bears the anterior carapace grooves of *P. johnsoni* but the cheliped tubercles are only weakly scalloped and lack free edges. The latter may be an effect of the small size of the animal and in most respects it more closely resembles *P. johnsoni*.

Coloration of the species was not recorded by Haig (1965a) except to note the median stripe on the carapace.

Distribution.— Xisha, Palau, Caroline and Marshall Islands, western and northern Australia from Cape Leeuwin in the southwest to Northern Territory.

Petrolisthes haswelli Miers, 1884

Petrolisthes haswelli Miers, 1884: 269, pl. 29 fig. A, a; Haig, 1965: 100; McNeill, 1968: 35; Haig, 1972: 447.

Material.— 2 ♀♀, 10.0x9.6, 8.0x7.8 mm, Slate Island (stn 5), intertidal rocks and sand, 9.vii.1988, WAM 62-89; ♂, 8.8x8.1 mm, 2 ♀♀, 9.0x8.3 (ovig.), 7.3x7.0 mm, Careening Bay (stn 41), intertidal rocks, 13 July 1988, RMNH D 37807; ♂, 11.0x10.6 mm, Albert Island (stn 43), intertidal rocks, 14.vii.1988, WAM 59-89; 4 ♂♂, 9.5x8.5-5.6x5.2 mm, ♀, 6.4x5.8 mm, East Montalivet Island (stn 50a), intertidal rocks, 15.vii.1988, WAM 60-89.

Remarks.— The Kimberley specimens agree well with descriptions in Miers (1884) and Haig (1965). Miers' figure (1884: pl. 29 fig. A) exaggerates the sinuous form of the front of the carapace, giving the impression that it is bilobate. Although Miers noted that the tubercles on the upper surface of the palm are "merging... into longitudinal striae", his figure does not illustrate ridges which can be quite distinct on the Kimberley specimens.

Distribution.— Queensland, Northern Territory and Western Australia south to Shark Bay.

Petrolisthes kranjiensis Johnson, 1970

Petrolisthes kranjiensis Johnson, 1970: 16, fig. 2 h-k; Haig, 1988: 76.

Material.— ♂, 8.8x8.1 mm, Heywood Islands (stn 14), mangal, 10.vii.1988, RMNH D 37808; ♂, 5.8x5.3 mm, Corneille Island (stn 65), intertidal rocks and mangal, 19.vii.1988, WAM 65-89; 2 ♀♀, 10.5x10.1, 8.6x8.1 mm, Hunter River estuary (stn 81), mangal, mud, rocks, 22.vii.1988, WAM 63-89.

Coloration (in life).— Carapace and chelipeds mottled red-orange and cream;

walking legs brown with cream bands distally on merus, subdistally on carpus, distally and just proximal to midlength on propodus; distinct blue-purple on distal segments of endopod of maxilliped 2 and 3, contrasting with orange setae.

Remarks.— One of the Indo-West Pacific species complex keyed by Haig (1988), *P. kranjiensis* is very similar to *P. teres* Melin discussed by Haig (1964, 1965). The species are distinguished most easily by the development of the proximoventral spine on the merus of the first walking leg. *P. kranjiensis* lacks the long marginal setae on the propodus of the chelae and the bifurcate dactyl of walking legs characteristic of *P. limicola* Haig.

Distribution.— Singapore, now recorded from northwestern Australia.

Petrolisthes limicola Haig, 1988

Petrolisthes limicola Haig, 1988: 71, figs. 1, 2.

Material.— ♀, 6.7x6.2 mm, Hunter River estuary (stn 81), mangal, mud and rocks, 22.vii.1988, WAM 64-89.

Remarks.— The single specimen agrees well with Haig's (1988) description and figures. The absence of epibranchial and supraocular spines, the presence of long setae fringing the outer margin of the propodi of the chelae and the bifurcate dactyls of the walking legs are distinctive.

Distribution.— Northern Territory and now recorded from northwestern Australia.

Petrolisthes militaris (Heller, 1862)

Porcellana annulipes White, 1847a: 63 (nom. nud.).
Porcellana militaris Heller, 1862b: 523.
Petrolisthes annulipes; Miers, 1884: 270, 558, pl. 29 fig. B, b; Henderson, 1888; 106.
Petrolisthes militaris; Ortmann, 1892: 259; Rathbun, 1924: 29; Haig, 1964: 357, fig. 1; Haig, 1965: 98; Haig, 1966: 40; McNeill, 1968: 36; Haig, 1972: 447; Haig, 1983: 280.

Material.— ♂, 4.7x4.6 mm, Rob Roy Reef (stn 49), 8-9 m, limestone, coral and rubble, 15.vii.1988, WAM 929-88; 3 ♂♂, 4.3x4.2, 3.7x3.5, 3.0x2.7 mm, ♀, 5.0x4.8 mm, Long Reef, western edge (stn 58), to 15 m, silt, sand, coral and rubble, 17.vii.1988, RMNH D 37806; 2 ♂♂, 5.5x5.1, 5.1x4.6 mm, Cassini Island (stn 59), intertidal rocks and coral, 18.vii.1988, WAM 55-89; ♀ (ovig.), 6.6x6.5 mm, Lafontaine Island (stn 68), 5-24 m, sand and coral rubble, 19.vii.1988, WAM 119-89.

Remarks.— The species is readily recognised from the diagnosis of Haig (1965). The differences between *P. militaris* and *P. scabriculus* (Dana) in the anterior portion of the carapace are illustrated by Haig (1964). On some specimens the two bands of colour on the merus of pereiopods are very indistinct or indistinguishable.

Distribution.— Indian Ocean from Seychelle Islands to India and Nicobar Islands, Japan, Philippines, Indonesia, northern Australia from Shark Bay in the west to northern Queensland.

Petrolisthes spec.

Material.— ♂, 8.8x8.3 mm, Wildcat Reefs (stn 21), 7-22 m, limestone and coral, 11.vii.1988, WAM 68-89.

Coloration (in life).— Carapace brown with darker red spots; chelipeds similar or slightly darker dorsally, deep red-violet ventrally. Walking legs with merus pale brown with dark red spots and irregular distal band(s); carpus with proximal and distal dark bands; propodus with proximal, midlength and distal dark bands.

Remarks.— This species closely resembles *P. militaris* (see Haig, 1964; 1965) and *P. heterochrous* Kropp (see Kropp, 1986) in carapace spination but differs conspicuously in lacking any development of a longitudinal crest on the palm of the chelae. Instead, the dorsal surface of the chelae is evenly covered in squamiform tubercles. The single specimen could not be identified but is possibly a new species and certainly a new record for Western Australia.

Pisidia gordonae (Johnson, 1970)

Porcellana serratifrons; Henderson, 1888: 110 (part); Grant & McCulloch, 1906: 39; McNeill, 1968: 34 (not *P. serratifrons* Stimpson, 1858).
Porcellana spinulifrons; Gordon, 1931: 530, figs. 4C, 5 (not *P. spinulifrons* Miers, 1879 = *P. serratifrons* Stimpson).
Pisidia cf. *Spinulifrons*; Haig, 1965: 105.
Porcellana (*Pisidia*) *gordoni* Johnson, 1970: 29, fig. 3m-p.
Pisidia gordoni; Haig, 1973: 283; Haig, 1978: 707; Haig, 1981: 277.

Material.— 3 ♀♀, 4.2x3.9 (ovig.), 3.4x3.2, 3.1x2.8 mm, Don Island (stn 50b), 8 m, sand and coral rubble, 16.vii.1988, WAM 933-88; ♂, 4.4x4.1 mm, ♀ (ovig.), 4.5x4.2 mm, west of Buffon Island (stn 85), 3-22 m, coral and rubble, 23.vii.1988, WAM 67-89.

Remarks.— *Pisidia gordonae* was collected from similar habitats to, but in fewer numbers than, *L. spinuligera*. This species can be recognised as *P.* cf. *Spinulifrons* (Miers) noted by Haig (1965). The Kimberley specimens display some differences from Haig's diagnosis, including the extension of the row of spines along the entire mesial edge of the carpus of chelipeds, although the spines are much larger proximally. Haig (1965) and Johnson (1970) discussed the probable confusion between this species and *Pisidia serratifrons* (Stimpson) (the latter including the synonymous *P. spinulifrons* (Miers)).

The termination of the name is here emended to correspond in gender to the person after whom the species was named, Isabella Gordon (International Code of Zoological Nomenclature, Articles 31(a)(ii), 32(c)(i)).

Distribution.— East Africa and Red Sea, Hong Kong, Indonesia, India, Australia from northern areas of Western Australia, Northern Territory and Queensland.

Galatheidae Samouelle, 1819

Galathea orientalis Stimpson, 1858

Galathea orientalis Stimpson, 1858: 252; Ortmann, 1892: 252, pl. 11 fig. 10, 10a,i; Tirmizi, 1966: 182, figs.

6-8; Miyake & Baba, 1967: 232, fig. 5; Haig, 1972: 447.

Material.— ♂, 5.0 mm, Rob Roy Reef (stn 49), 0-9 m, coral and rubble, 15.vii.1988, WAM 931-88; ♂, 4.8 mm, Irvine Island (stn 108), intertidal, coral, 25.vii.1988, WAM 34-89; ♂, 4.7 mm, Shirley Island (stn 115), intertidal, coral, 26.vii.1988, WAM 208-89.

Remarks.— The specimens agree well with most descriptions of the species and the figures of Miyake & Baba (1967). The anteromedian spine on the lateral face of the pterygostomial flap and spination of the carpus and merus of the third maxillipeds facilitate identification of *G. orientalis*. Tirmizi's (1966) description and figures indicate the species to be very variable in several characters.

Distribution.— Japan, Hong Kong, Bonin Islands, northwestern Australia.

Infraorder Brachyura Latreille, 1803
Calappidae De Haan, 1833
Calappa hepatica (Linnaeus, 1758)

Cancer hepatica Linnaeus, 1758: 630.
Cancer tuberculatus Herbst, 1785: 204, pl. 13 fig. 78.
Calappa hepatica; Miers, 1877: 238; Haswell, 1882b: 136; Miers, 1884: 257; Grant & McCulloch, 1906: 24; McNeill, 1926b: 306; Ward, 1928: 243, pl. 27; Tyndale-Biscoe & George, 1962: 69, fig. 2.6; McNeill, 1968: 43; Sakai, 1976: 128, pl. 38 figs. 1, 3.

Material.— Carapace, 30.0x49.0 mm, Lamarck Island (stn 42), intertidal, 14.vii.1988, WAM 1020-88.

Distribution.— East Africa and Red Sea east to Japan, Hawaiian and Sandwich Islands, Australia from Houtman Abrolhos Islands in the west, north and east to Queensland and possibly as far south as Sydney.

Matuta granulosa Miers, 1877

Matuta granulosa Miers, 1877: 245, pl. 39 figs. 8, 9; Haswell, 1882b: 134; Tyndale-Biscoe & George, 1962: 71, fig. 4.2; Campbell & Stephenson, 1970: 246.

Material.— ♂, 14.3x17.2 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, WAM 40-89.

Remarks.— Coloration of the specimen agrees with that noted by Tyndale-Biscoe & George (1962) with red spots on the otherwise cream carapace and red bands at the base of the lateral spines.

Distribution.— Indian Ocean, northern Australia from Shark Bay in the west to Moreton Bay in the east.

Leucosiidae Samouelle, 1819
Leucosia perlata De Haan, 1841

Leucosia perlata De Haan, 1841: 134; Tyndale-Biscoe & George, 1962: 84, fig. 7.3a, b.
Leucosia moresbiensis Haswell, 1879: 49.

Leucosides perlata; Buitendijk, 1939: 230.

Material.— ♂, 18.5x15.5 mm, Descartes Island (stn 71), intertidal sand, 20.vii.1988, RMNH D 37757; 3 ♂♂, 21.5x18.6, 21.2x18.0, 20.3x17.0 mm, ♀, 21.0x18.2 mm, Shirley Island (stn 115), intertidal sand, 26.vii.1988, WAM 2116-88.

Remarks.— The tightly coiled male first pleopod (Tyndale-Biscoe & George, 1962: fig. 7.3a, b) is distinctive. Specimens bear a dark spot on each side of the cardiac region of the carapace.

Distribution.— Persian Gulf to Indonesia, Hong Kong, New Guinea and Western Australia from Cockburn Sound to Kimberleys.

Leucosia reticulata Miers, 1877

Leucosia reticulata Miers, 1877: 237, pl. 38 figs. 13-15; Haswell, 1879: 45; Haswell, 1882b: 118; Tyndale-Biscoe & George, 1962: 80, figs. 4.11, 8.6.

Material.— 4 ♂♂, 24.8x20.4-17.5x14.5 mm, 7 ♀♀, 24.0x20.8-15.5x13.2 mm (incl. ovig. ♀), Port George IV (stn 26), 5 m, sand, 12.vii.1988, WAM 2117-88, RMNH D 37758.

Remarks.— The species is keyed by Tyndale-Biscoe & George (1962) as having the "front not produced beyond eyes; anterior margin straight". On Kimberley specimens, the front is slightly produced beyond the eyes and the anterior margin is weakly sinuous giving a vaguely bilobate effect. There is considerable variation in development of the dark tubercles on the hepatic region of the carapace. In general, tubercle number increases with size but there are exceptions. While most specimens bear three to six tubercles per side, one large specimen has only three weak tubercles on one side and none on the other.

Distribution.— Western and northern Australia from Shark Bay to Darwin.

Myra affinis Bell, 1855

Myra affinis Bell, 1855: 296, pl. 32 fig. 2; Haswell, 1879: 50; Haswell, 1882b: 121; Miers, 1884: 250; Rathbun, 1924: 26; Tindale-Biscoe & George, 1962: 88, figs. 7.10a,b, 8.9a, 8.10b; Campbell & Stephenson, 1970: 250, fig. 11.

Material.— ♀, 14.4x11.5 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, WAM 2119-88.

Remarks.— *M. affinis* is very similar to *M. mammilaris* Bell. Miers (1884) suggested that the two species might be synonymous but subsequent workers have recognised both species and Tyndale-Biscoe & George (1962) keyed them apart on the basis of the relative sizes and shapes of the three posterior carapace spines. On this specimen, the median spine is only slightly longer and more pointed than the laterals and scarcely "long, recurved, sharply pointed" (Tyndale-Biscoe & George, 1962: 88). The specimen agrees with other animals identified as *M. affinis* by Tyndale-Biscoe & George in the WAM collection, however, and is therefore assigned to that species. Campbell & Stephenson (1970) illustrated (fig. 11) the median lobe as only slightly sharper than the laterals on *M. affinis* from Queensland.

Distribution.— Red Sea, India, Indonesia, Philippines, northern Australia.

Myra australis Haswell, 1879

Myra Australis Haswell, 1879: 50, pl. 5 fig. 3; Haswell, 1882b: 122.
Myra australis Miers, 1884: 251; Tyndale-Biscoe & George, 1962: 88, figs. 7.11a, b, 8.9b, 8.10a.

Material.— ♀, 21.9x19.2 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, WAM 2121-88.

Remarks.— The specimen examined here agrees well with earlier descriptions. Tyndale-Biscoe & George (1962) discussed the validity of *M. australis* as separate from *M. affinis* Bell. The specimen agrees with the brief colour notes of Tyndale-Biscoe & George (1962) although they did not record the orange lyre-shaped patch evident on the carapace of this animal.

Distribution.— Singapore, Malaysia, Queensland and Western Australia north of Dampier Archipelago.

Myra cf. *australis*

Material.— ♂, 13.7x11.4 mm, ♀, 7.9x6.5 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, WAM 2120-88.

Remarks.— While similar to *M. australis* in many respects, these small specimens bear irregularly sized tubercles on the carapace and the median posterior spine is larger and sharper than the laterals. The animals agree well with a specimen in the WAM collection identified as *M. australis* by R. George although the above variations were not noted by Tyndale-Biscoe & George (1962). It appears that in several species of *Myra*, juveniles bear larger, more irregularly sized tubercles than adults and the median spine may also be allometrically variable.

Philyra platychira De Haan, 1841

Philyra platychira De Haan, 1841: 132, pl. 33 fig. 6; McNeill & Ward, 1930: 368, fig. 1; Tyndale-Biscoe & George, 1962: 75, fig. 4.9; Sakai, 1976: 109, pl. 32 fig. 4, text-fig. 59a.

Material.— ♂, 10.5x9.9 mm, ♀, 10.5x9.9 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, WAM 2118-88.

Distribution.— East Africa and Persian Gulf to India, Indonesia, Philippines, Japan, eastern and southwestern Australia and now recorded from northwestern Australia.

Majidae Samouelle, 1819

Hyastenus hilgendorfi De Man, 1887

Hyastenus hilgendorfi De Man, 1887b: 14, pl. 1 figs. 3, 4; Griffin, 1968: 103, pl. 1, text-fig. 1; Griffin &

Tranter, 1986: 147, fig. 42 h, i.
Halimus hilgendorfi; Rathbun, 1906: 881.

Material.— ♂, 14.5x7.4 mm, west of Buffon Island (stn 85), 3-22 m, coral and rubble, 23.vii.1988, WAM 2123-88.

Remarks.— The genus *Hyastenus* is a difficult group taxonomically (Griffin, 1968) but the present small specimen concurs well with the above descriptions of the species. The male first pleopod appears identical to that illustrated for *H. hilgendorfi* in Griffin (1968: fig. 1a) and Griffin & Tranter (1986: fig. 42h,i). Several similar species differ slightly in the form of the pleopod, ornamentation of the carapace or shape of the orbital hiatus (e.g. *H. auctus* Rathbun, *H. borradailei* (Rathbun), *H. sebae* White, *H. trispinosus* Rathbun and *H. whitei* Griffin).

Distribution.— East Africa, Red Sea east to India, Indonesia, Philippines, Hawaiian Islands, northern Australia including Queensland, Northern Territory and now recorded from Western Australia.

Menaethius monoceros (Latreille, 1825)

Pisa monoceros Latreille, 1825: 139.
Menaethius monoceros; H. Milne Edwards, 1834: 339; Haswell, 1882b: 9; Miers, 1884: 521; McNeill, 1926b: 306; Montgomery, 1931: 417; Forest & Guinot, 1961: 14, fig. 9a, b; McNeill, 1968: 44; Sakai, 1976: 205, pl. 70 fig. 1; Griffin & Tranter, 1986: 89.

Material.— ♂, 18.2x11.1 mm, Albert Island (stn 43), intertidal, rocks and coral, 14.vii.1988, WAM 1010-88.

Remarks.— This species carries a very extensive synonymy, as noted by Sakai (1976) and Griffin & Tranter (1986). This is due in part to variability of the species. The male first pleopod of the present specimen agrees well with the illustration in Forest & Guinot (1961).

Griffin & Tranter (1986) recorded the absence of a distoventral setal clump or produced lobe on the propodus of the first walking leg as a diagnostic difference between *Menaethius* and the similar genus *Huenia*. The propodus of this specimen bears a clump of three fine setae distoventrally but there is no produced lobe and hence the condition, while diverging slightly from Griffin & Tranter's generic key (1986: 65), is much closer to *Menaethius*.

The walking legs are noncarinate, hence differing from *M. orientalis* (Sakai), but the base of the rostrum is somewhat broadened. Griffin & Tranter (1986) noted that Hawaiian specimens also display broader rostra than is typical for the species. The anterior branchial lobe is less pronounced than in the illustration of Sakai (1976: pl. 70 fig. 1).

Distribution.— East Africa and Red Sea east to Japan, Fijian and Hawaiian Islands, western, northern and eastern Australia.

Schizophrys aspera (H. Milne Edwards, 1834)

Mithrax aspera H. Milne Edwards, 1834: 320.

Schizophrys aspera; A. Milne Edwards, 1872: 231, pl. 10 fig. 1, 1a-f; Haswell, 1882b: 22; Miers, 1884: 197; Rathbun, 1924: 6; Hale, 1927: 138; Griffin, 1966: 286, pl. 16; Griffin & Tranter, 1986: 245, figs. 88a, 91g, h.

Material.— ♀, 35.7x30.9 mm, Bernouilli Island (stn 30), intertidal, rocks and coral, 12.vii.1988, WAM 2122-88.

Remarks.— Diagnostic characters of the species have been most recently discussed and illustrated by Griffin & Tranter (1986). In particular, *S. dama* (Herbst), a species also occurring in northwestern Australia, can be distinguished by its possession of two lateral rostral accessory spines.

Distribution.— East Africa and Red Sea, to Indonesia, Japan, Fijian and Hawaiian Islands, widespread around Australia but more common in the north.

Corystidae Samouelle, 1819
Gomeza bicornis Gray, 1831

Gomeza bicornis Gray, 1831: 39; Grant & McCulloch, 1906: 19; Hale, 1927: 145; Sakai, 1976: 304, fig. 170.
Corystes (Oeidea) vigintispinosa De Haan, 1835: 44, pl. 2 fig. 5.
Gomeza vigintispinosa; A. Milne Edwards, 1874: 52, pl. 3 fig. 5.

Material.— Carapace, 36.1x25.4 mm, Fenelon Island (stn 64), 7-8 m, sand and coral, 18.vii.1988, WAM 50-89.

Remarks.— The dorsal tubercles on the carapace of *G. bicornis* may be fairly evenly distributed so that the transverse series of tubercles noted by Sakai (1976: 305) are inconspicuous.

Distribution.— Sri Lanka, Indonesia, Japan, southern and eastern and now recorded from northwestern Australia.

Portunidae Rafinesque, 1815
Portunus hastatoides Fabricius, 1798

Portunus hastatoides Fabricius, 1798: 368; Stephenson & Campbell, 1959: 101, pl. 1 fig. 4, pls 4D, 5D, text-figs. 2D, 3D; Crosnier, 1962: 68, figs. 96, 109, 117, 122-123; Campbell & Stephenson, 1970: 271; McNeill, 1968: 55; Stephenson, 1972b: 40.
Neptunus (Amphitrite) hastatoides; De Haan, 1833: 39, pl. 1 fig. 3; Miers, 1884: 229.
Neptunus (Hellenus) hastatoides; Alcock, 1899: 38; Sakai, 1939: 391, pl. 47 fig. 1.
Portunus (Xiphonectes) hastatoides; Sakai, 1976: 344, pl. 119 fig. 2.

Material.— ♂, 11.6x25.5 mm, ♀, 10.2x23.0 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, WAM 12-89 (♂) and RMNH D 38342(♀).

Distribution.— East Africa to Philippines and Japan, Australia from Exmouth Gulf in the west, north and east to Darwin and Torres Straits, south to Moreton Bay.

Portunus pelagicus (Linnaeus, 1767)

Cancer pelagicus Linnaeus, 1767: 1042.

Portunus pelagicus; Fabricius, 1798: 367; Hale, 1927: 149, fig. 150; Stephenson & Campbell, 1959: 96, pl. 1 fig. 1, pls 4A, 5A, text-figs. 2A, 3A; Campbell & Stephenson, 1970: 271; Stephenson, 1972b: 41.
Neptunus pelagicus; De Haan, 1833: 37, pls 9, 10; Haswell, 1882b: 77; Miers, 1884: 229; Calman, 1900: 21.
Portunus (Portunus) pelagicus; Rathbun, 1924: 22; Sakai, 1976: 339, pl. 118.

Material.— 2 ♀♀, 22.1x50.8, 11.6x24.7 mm, Shirley Island (stn 115), intertidal, 26.vii.1988, WAM 10-89.

Distribution.— Mediterranean Sea, East Africa to Philippines, Tahitian Islands, New Zealand, Australia on all coasts.

Portunus tenuipes (De Haan, 1833)

Amphitrite tenuipes De Haan, 1833: 39, pl. 1 fig. 4; Haswell, 1882b: 83.
Neptunus tenuipes; A. Milne Edwards, 1861: 335, 339.
Portunus tenuipes; Stephenson & Campbell, 1959: 103, pl. 2 fig. 1, pls 4E, 5E, text-figs. 2E, 3E; Stephenson & Rees, 1967: 49, fig. 15; McNeill, 1968: 55; Stephenson, 1972b: 43.
Portunus (Monomia) tenuipes; Sakai, 1976: 340, pl. 120 fig. 3.

Material.— ♀, 9.4x20.8 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, WAM 11-89.

Remarks.— This is the only species of *Portunus* with three distinct frontal lobes occurring in Australian waters.

Distribution.— Andaman Islands to Philippines, Japan, northern Australia from Exmouth Gulf to Bowen, Queensland.

Scylla serrata (Forskål, 1775)

Cancer serratus Forskål, 1775: 90.
Cancer olivaceus Herbst, 1796: 157, pl. 38 fig. 3.
Scylla serrata; De Haan, 1833: 44; Haswell, 1882b: 79; Stephenson & Campbell, 1960: 111, pl. 4 fig. 4, pls 5N, 6C, text-fig. 2N; McNeill, 1968: 49; Stephenson, 1972b: 44; Sakai, 1976: 335, pl. 115.

Material.— ♀, 84.7x122.4 mm, northwest of Uwins Island (stn 29), mangal, mud, 12.vii.1988, WAM 121-89.

Remarks.— Serène (1952), Stephenson & Campbell (1960) and Sakai (1976) should be consulted for more comprehensive synonymies and potential congeners of this widespread species. There is growing evidence that the Australian populations may in fact comprise two species (B. Hill, pers. comm.) but neither the validity of more than one species nor their correct names has been resolved.

Distribution.— East Africa and Red Sea, east to Indonesia, Japan, New Zealand, Tahitian and Hawaiian Islands, Australia from North West Cape north and east to Port Hacking, New South Wales.

Thalamita admete (Herbst, 1803)

Cancer admete Herbst, 1803: 40, pl. 57 fig. 1.
Thalamita admete; Latreille, 1829: 33; Miers, 1884: 230; Grant & McCulloch, 1906: 19; McNeill, 1926b:

307; Stephenson & Hudson, 1957: 320, pl. 1 fig. 1, pls 7A, 10A, text-figs. 2I, 3I; Forest & Guinot, 1961: 30, fig. 19a,b; Crosnier, 1962: 96, figs. 154, 157, 162-164, 168; Stephenson & Rees, 1967: 56, fig. 20; McNeill, 1968: 51; Campbell & Stephenson, 1970: 275; Stephenson, 1972b: 44; Sakai, 1976: 377, pl. 130 fig. 2.

Thalamita savignyi A. Milne Edwards, 1861: 357.

Material.— 2 ♀♀ (ovig.), 11.0x18.6, 9.5x16.2 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, RMNH D 37759; 3 ♂♂, 15.9x27.7, 9.5x16.4, 8.6x14.4 mm, ♀, 8.6x14.2 mm, East Montalivet Island (stn 50a), intertidal rocks and sand, 15.vii.1988, WAM 1009-88; ♀ (ovig.), 12.0x20.7 mm, Shirley Island (stn 115), intertidal sand and coral, 26.vii.1988, WAM 14-89.

Remarks.— In most characters, these specimens concur well with recent redescriptions of *T. admete* (e.g. Stephenson & Hudson, 1957). The species is very variable and the Kimberley specimens display variation in the spination of the chelae. Spines on the upper surface of the palm range in number from three to six, and there can be variation between chelae on the same specimen. In addition, there is considerable variation in the size of the fourth anterolateral tooth. The first male pleopod is well illustrated by Stephenson & Hudson (1957: figs. 2I, 3I), although pleopod spination can vary in this species (Stephenson & Rees, 1967).

Distribution.— East Africa and Red Sea, east to Japan, Hawaiian and Fijian Islands, northern Australia from Broome east to Port Jackson.

Thalamita crenata (H. Milne Edwards, 1834)

Portunus crenatus H. Milne Edwards, 1834: 461.

Thalamita crenata; H. Milne Edwards, 1834: 461; Miers, 1884: 232; Rathbun, 1924: 24; Stephenson & Hudson, 1957: 332, pl. 2 fig. 3, pls 7F, 9C, text-figs. 2Q, 3Q; McNeill, 1968: 52; Stephenson, 1972b: 46; Sakai, 1976: 369, pl. 132 fig. 1.

Material.— ♀, 35.3 x 52.2 mm, Corneille Island (stn 65), intertidal, sand, rocks, 19.vii.1988, WAM 16-89.

Distribution.— South and east Africa, Red Sea east to Japan, Hawaiian and Tuamotu Islands, northern Australia from Exmouth Gulf in the west to Sydney in the east.

Thalamita danae Stimpson, 1858

Thalamita danae Stimpson, 1858: 39; Stephenson & Hudson, 1957: 335, pl. 3 fig. 1, pls 7G, 10D, text-figs. 2N, 3N; Stephenson, 1972a: 145, figs. 6, 7; Stephenson, 1972b: 46; Sakai, 1976: 369, pl. 132 fig. 3.

Thalamita stimpsoni A. Milne Edwards, 1861: 362, 367, pl. 35 fig. 4; Haswell, 1882b: 80; Miers, 1884: 232; Grant & McCulloch, 1906: 19; Ward, 1937: 33; Stephenson & Hudson, 1957: 356, pl. 6 figs. 1-3, pls 8R, 9I, text-figs. 2M, 3M; McNeill, 1926b: 307; McNeill, 1968: 51; Sakai, 1976: pl. 131 fig. 3.

Thalamita prymna var. *proxima* Montgomery, 1931: 429, pl. 24 fig. 1, pl. 29 fig. 1, 1a.

Material.— ♀, 29.1x45.2 mm, Slate Island (stn 5), intertidal rocks and sand, 9.vii.1988, RMNH D 37786; ♂, 16.1x10.1 mm, Jackson Island (stn 24), intertidal, 11.vii.1988, RMNH D 37761; ♂, 33.9x52.1 mm, Careening Bay (stn 41), intertidal, 13.vii.1988, WAM 997-88; ♀, 25.1x38.9 mm, East Montalivet Island (stn 50a), intertidal sand and rocks, 15.vii.1988, WAM 1007-88.

Remarks.— All specimens are assignable to the "danae" form, with the fourth lateral spine only slightly smaller than the fifth, rather than the "stimpsoni" form with very small fourth spine. The two nominal species were synonymised by Stephenson (1972a) but some later authors still recognise both species (e.g. Sakai, 1976).

Distribution.— Red Sea and East Africa to Japan, Fijian Islands, northern Australia from Broome east to Yamba, New South Wales.

Thalamita intermedia Miers, 1886

Thalamita intermedia Miers, 1886: 196, pl. 16 fig. 1; Rathbun, 1924: 24; Hale, 1927: 151, fig. 152; Stephenson & Hudson, 1957: 341, pl. 3 fig. 4, pl. 10G, text-fig. 4; Stephenson, 1972b: 48.

Material.— ♀, 10.3x16.0 mm, Lafontaine Island (stn 68), 5-24 m, sand and rubble, 19.vii.1988, WAM 120-89.

Remarks.— In several keys to *Thalamita species*, *T. intermedia* is diagnosed as having the front of the carapace "perfectly straight" (Stephenson & Hudson, 1957; Stephenson, 1972b). On this specimen, and in the description of the species in Stephenson & Hudson (1957), the front has "four lobes ...; medians projecting slightly more forward than laterals".

Distribution.— Australia from Eighty Mile Beach south of Broome, across the north to Torres Straits and south to South Australia.

Thalamita prymna (Herbst, 1803)

Cancer prymna Herbst, 1803: 41, pl. 57 fig. 2.
Thalamita prymna; H. Milne Edwards, 1834: 461; Haswell, 1882b: 80; Calman, 1900: 22; Boone, 1934: 73, pls 31-34; Stephenson & Hudson, 1957: 346, pl. 4 fig. 3, pls 8L, 9E, text-figs. 2R, 3R; Stephenson, 1972b: 50; Sakai, 1976: 372, pl. 131 fig. 1.

Material.— ♂, 11.1x18.4 mm, Condillac Island (stn 54a), intertidal, 16.vii.1988, RMNH D 37762; ♂, 11.4x18.0 mm, carapace, 23.4x37.5 mm, Condillac Island (stn 54b), 10 m, sand and coral, 16.vii.1988, WAM 995-88.

Distribution.— South Africa and Red Sea east to Samoa and Japan, Australia from Houtman Abrolhos Islands in the west north and east to Torres Straits and south to Shell Harbour, New South Wales.

Thalamita spinimana Dana, 1952

Thalamita spinimana Dana, 1852b: 283; Dana, 1855: pl. 17 fig. 8a-c; Stephenson & Hudson, 1957: 354, pl. 5 fig. 3, pls 8P, 9H, text-figs. 2O, 3O; McNeill, 1968: 53; Stephenson, 1972b: 51.

Material.— ♂, 18.3x29.7 mm, Careening Bay (stn 41), intertidal, 13.vii.1988, RMNH D 37763; ♂, 40.0x65.3 mm, Irvine Island (stn 108), intertidal coral, 25.vii.1988, WAM 2014-88.

Distribution.— Viti Archipelago, Indonesia, Malaysia, Singapore, north Queensland and now northwestern Australia.

Xanthidae MacLeay, 1838
Actaea polyacantha (Heller, 1861)

Chlorodius polyacanthus Heller, 1861a: 11; Heller, 1861b: 339, pl. 3 fig. 21.
Actaeodes polyacanthus; Miers, 1884: 206.
Actaea polyacantha; Ortmann, 1893: 455; Ward, 1932: 247; McNeill, 1968: 72; Guinot, 1976: 236, pl. 13 fig. 6, text-fig. 40B, b; Sakai, 1976: 443, fig. 234; Serène, 1984: 114, pl. 14E, text-fig. 67.

Material.— ♀, 9.4x13.6 mm, Slate Island (stn 5), intertidal rocks and sand, 9.vii.1988, WAM 1024-88; ♀, 6.7x9.6 mm, East Montalivet Island (stn 50a), intertidal rocks and sand, 15.vii.1988, WAM 1000-88; 2 ♀♀, 8.2x11.7, 5.6x7.8 mm, Condillac Island (stn 54a), intertidal, sand and rocks, 16.vii.1988, RMNH D 37811.

Coloration (in life).— Intense red with fingers of chelae and distal part of dactyl of ambulatory legs white.

Distribution.— East Africa and Red Sea to New Guinea, Japan, Fijian and Samoan Islands, northwestern and northeastern Australia.

Actaeodes mutatus Guinot, 1976

Actaea areolata Dana, 1852b: 162; Dana, 1855: pl. 8 fig. 1; A. Milne Edwards, 1865: 264 (not *Actaeodes areolatus* Dana, 1852a: 77).
Actaea areolata?; Miers, 1884: 209; Rathbun, 1924: 16.
Actaeodes areolatus; Guinot, 1967: 561; Sakai, 1976: 449.
Actaeodes mutatus Guinot, 1976: 247; Serène, 1984: 133.

Material.— ♀, 9.4x15.0 mm, East Montalivet Island (stn 50a), intertidal, rocks and sand, 15-16.vii.1988, WAM 1015-88; ♀, 9.4x15.9 mm, Lafontaine Island (stn 68), 5-24 m, sand and rubble, 19.vii.1988, RMNH D 37812.

Remarks.— Guinot (1976) discussed the nomenclature and morphology of this species and Serène (1984) keyed species of the genus. *A. mutatus* is distinguished from the similar *A. semoni* (Ortmann) in having the orbital hiatus open and the carapace region 3M entire and not divided into three parts.

Distribution.— Thailand, Singapore, Japan, northern Australia from Cape Jaubert south of Broome east to central coastal Queensland.

Atergatis floridus (Linnaeus, 1767)

Cancer floridus Rumphius, 1705: 11, pl. 8 fig. 5;
Cancer floridus Linnaeus, 1767: 1041.
Cancer ocyroe Herbst, 1801: 20, pl. 54 fig. 2.
Atergatis ocyroe; H. Milne Edwards, 1834: 375; McNeill & Ward, 1930: 382; Ward, 1932: 241.
Atergatis floridus; De Haan, 1835: 46; Dana, 1852b: 159; Dana, 1855: pl. 7 fig. 4; Haswell, 1882b: 41; Miers, 1884: 207; Grant & McCulloch, 1906: 9; Forest & Guinot, 1961: 41; McNeill, 1968: 72; Sakai,

1976: 409, pl. 148 fig. 2; Serène, 1984: 148, pl. 21D, text-fig. 87.

Material.— ♂, 21.8x32.1 mm, Slate Island (stn 5), intertidal rocks and sand, 9.vii.1988, RMNH D 37814; ♂, 38.3x54.7 mm, Bernouilli Island (stn 30), intertidal rocks and coral, 12.vii.1988, WAM 2017-88; ♂, 35.8x51.9 mm, Albert Island (stn 43), intertidal rocks, 14.vii.1988, WAM 1001-88; ♂, 10.0x14.7 mm, East Montalivet Island (stn 50a), intertidal rocks, 15-16.vii.1988, WAM 1018-88; ♂, 11.9x17.8 mm, Condillac Island (stn 54a), intertidal rocks and sand, 16.vii.1988, WAM 924-88; ♂, 31.0x45.1 mm, Cassini Island (stn 59), intertidal rocks and coral, 18.vii.1988, RMNH D 37813; ♀, 36.8x54.2 mm, east of Heywood Island (stn 102), 3-4 m, coral and limestone, 24.vii.1988, WAM 2018-88.

Remarks.— This species is one of the most common and certainly most easily recognised intertidal crabs in the Kimberleys.

Distribution.— Red Sea and east Africa, east to southeast Asia, Japan, Hawaiian Islands, Australia from Perth area north and east to midcoastal Queensland.

Atergatis integerrimus (Lamarck, 1801)

Cancer integerrimus Lamarck, 1801: 272.
Cancer (Atergatis) integerrimus; De Haan, 1835: 45, pl. 14 fig. 1.
Atergatis integerrimus; Dana, 1852b: 158; Gordon, 1934: 25, fig. 14A; Sakai, 1976: 410, pl. 147 fig. 2; Serène, 1984: 151, pl. 21F.

Material.— ♂, 27.6x46.8 mm, Slate Island (stn 5), intertidal rocks and sand, 9.vii.1988, RMNH D 37815; ♂, 33.7x55.6 mm, ♀, 8.3x13.7 mm, East Montalivet Island (stn 50a), intertidal rocks and sand, 15.vii.1988, WAM 1004-88, WAM 1041-88; ♂, 6.7x10.8 mm, Long Reef, west edge (stn 58), to 15 m, coral and limestone, 17.vii.1988, WAM 1040-88.

Remarks.— Large Kimberley specimens are unequivocally identifiable as *A. integerrimus*. The small animals (carapace width <10 mm) included here provoke some questions however. Although morphologically similar to adults of *A. integerrimus*, their carapace colour pattern is similar to that described for juveniles of *A. roseus* (Rüppell) in being brown with a white or cream band around the anterior and lateral margins (Serène, 1984: 146). The Kimberley juveniles differ from *A. roseus* in having the carapace less densely punctate and slightly broader, and the crest on the upper margin of the cheliped palms is distinct and relatively sharp. I regard it as more likely that the juveniles undergo ontogenetic changes in colour rather than in this suite of morphological characters and accordingly assign them to *A. integerrimus*.

Distribution.— East Africa to southeast Asia, Japan, now recorded from northwestern Australia.

Chlorodiella nigra (Forskål, 1775)

Cancer niger Forskål, 1775: 89.
Chlorodius niger; Ruppell, 1830: 20, pl. 4 fig. 7; Dana, 1852b: 216; Dana, 1855: pl. 12 fig. 5; Haswell, 1882b: 62; Miers, 1884: 215, 531; Grant & McCulloch, 1906: 12.
Chlorodius nebulosus Dana, 1852a: 214; Dana, 1855: pl. 12 fig. 3.
Chlorodius depressus Heller, 1861b: 338.

Chlorodiella nigra; Rathbun, 1897: 157; Hale, 1929: 70; McNeill & Ward, 1930: 383; Montgomery, 1931: 441; Forest & Guinot, 1961: 95, figs. 87-89, 97a, b; McNeill, 1968: 74; Sakai, 1976: 465, pl. 166 fig. 1; Serène, 1984: 258, pl. 36B, text-fig. 168.

Material.— 10 specs, 10.4x16.3-4.4x6.6 mm, east of Heywood Island (stn 102), 3-4 m, coral, rubble, limestone, 24.vii.1988, WAM 2021-88 (8), RMNH D 37816 (2).

Remarks.— The carapace and ambulatory legs of these specimens are very finely granular rather than being strictly smooth as noted by Serène (1984). There is variation in the development of the 4th lateral tooth.

Distribution.— Red Sea and East Africa to Japan, Southeast Asia, Hawaiian Islands, Samoa and Sandwich Islands, Australia from Houtman Abrolhos Islands in the west across northern Australia and south to Sydney.

Cymo cerasma spec. nov.
(fig. 5)

Material.— Holotype: ♂, 13.1x14.5 mm, Fenelon Island (stn 64), 7-8 m, sand and coral, 18.vii.1988, WAM 6-89.— Paratypes: ♀, 9.2x10.6 mm, type locality, WAM 204-89; ♂, 4.4x4.4 mm, Wildcat Reefs (stn 21), 7-22 m, coral, 11.vii.1988, WAM 2024-88; ♂, 6.9x7.3 mm, ♀, 8.2x8.8 mm, Rob Roy Reef (stn 49), 8-9 m, coral and rubble, 15.vii.1988, WAM 1002-88; ♂, 5.5x5.9 mm, ♀, 7.1x7.8 mm, Long Reef, west edge (stn 58), to 15 m, coral and rock, 17.vii.1988, RMNH D 37823.

Description.— Carapace (fig. 5a) 1.1-1.2 times broader than long, shallowly convex longitudinally and transversely, anterolateral margins in evenly curving arc, posterolateral margins almost straight. Front slightly less than half width of carapace, with deep V-shaped median and preorbital clefts; frontal margin almost straight, bearing numerous irregularly sized acute spines and tubercles, these blunter (abraded) on holotype than on smaller specimens (fig. 5b); preorbital lobes also spinose. Supraorbital margins tuberculate. Anterolateral margins irregularly spinose and tuberculate, with three indistinct lobes, these bearing slightly larger spines or tubercles; posterolateral margins with small or indistinct tubercles. Dorsal surface of carapace with very fine tomentum (this overgrown with coralline algae on holotype) and some tufts of short plumose setae; setae slightly more numerous frontally and laterally. Regions of carapace indistinct with very shallow furrows; deeper furrows extending posteriorly from median and preorbital frontal clefts. Carapace with irregularly sized, often acute granules dorsolaterally and in irregular row transversely across protogastric region; carapace medially and posteriorly unarmed, merely uneven and punctate.

Infraorbital margins (fig. 5c) tuberculate, larger tubercles mesially near basal segment of antenna. Flagellum of antenna with free access to orbit; basal segment with row of low tubercles. Epistome with small tubercles in row bordering antennular recess. Subhepatic regions with low, irregularly sized tubercles. Third maxilliped (fig. 5c) with merus about 0.6 times length of ischium; mesial margin of ischium and merus finely dentate; distomesial angle of merus slightly produced.

Chelipeds unequal, one cheliped (the right on all specimens but one) distinctly longer and stouter than other. Larger cheliped (fig. 5d) with dactyl distinctly longer

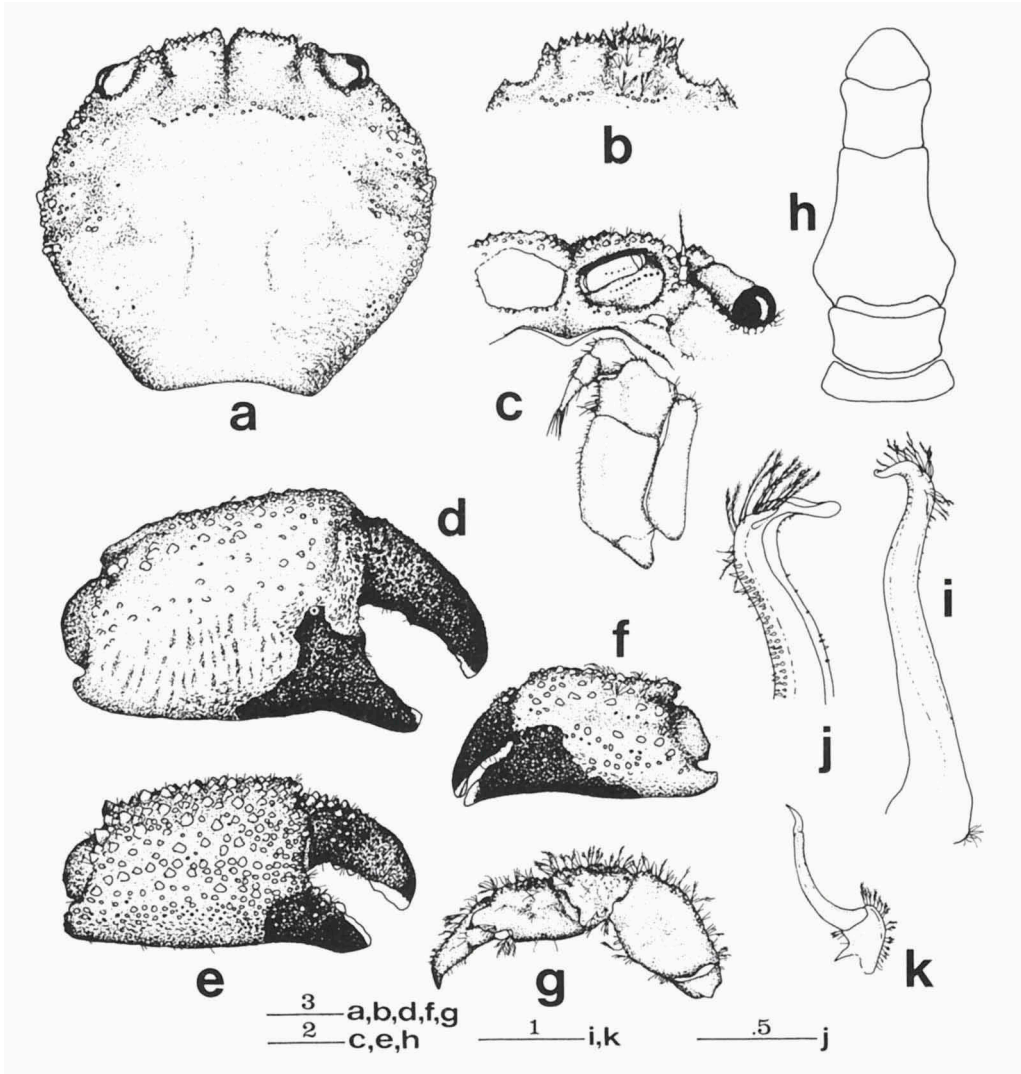

Fig. 5. *Cymo cerasma* spec. nov., a, c, d, f-k holotype ♂, b, e paratype ♀ (WAM 204-89). a, carapace (dorsal view); b, frontal margin of ♀ (dorsal view); c, epistome, suborbital margin, left third maxilliped; d, right chela of ♂ (lateral view); e, right chela of ♀ (lateral view); f, left chela of ♂ (lateral view); g, left third ambulatory leg (lateral view); h, abdomen of ♂; i, left first pleopod of ♂; j, distal extremity of first pleopod of ♂; k, left second pleopod of ♂. Scales in mm.

and more curved than fixed finger, fingers black with tips and larger teeth of cutting edge cream or white. Dactyl smooth and punctate distally, with densely arranged tubercles proximally, tubercles largest near articulation with propodus. Fixed finger similarly tuberculate to dactyl, black of finger extending posteriorly almost half length of palm in holotype, less extensive in smaller males and females. Palm with lateral surface tuberculate, tubercles small and densely arranged with scattered larger acute tubercles dorsolaterally in holotype; in smaller males and females, lateral

face with larger acute tubercles over most of surface (fig. 5e). Lateral face with fairly dense coat of plumose setae on small specimens, setation becoming sparse with growth. Mesial surface almost smooth or with few scattered tubercles, lightly setose. Dorsal and lateral faces of carpus with numerous acute tubercles, these abraded and overgrown by coralline algae on holotype; one or two larger tubercles at distomesial angle. Merus with dorsal acute tubercles, lateral and mesial faces almost smooth. Dorsal surfaces and mesial and lateral margins of carpus and merus with plumose setae, setation reducing with age.

Smaller cheliped (fig. 5f) more elongate than larger, with fingers relatively longer and less curved. Fingers similar in ornamentation to those of large chela, with larger tubercles proximally. Black coloration of fixed finger extending slightly farther posteriorly than on larger chela, reaching 2/3 length of palm in holotype male but only short distance onto palm in smaller males and females. Ventral surface of palm finely tuberculate, lateral and dorsal surfaces with much larger, often acute tubercules and stout spines, these abraded on holotype. Mesial surface of palm almost smooth. Lateral and mesial surfaces of palm with plumose setae, these abraded and overgrown by coralline algae on holotype. Carpus and merus similar to those of large cheliped.

Ambulatory legs (fig. 5g) stout, much shorter than chelipeds. Proportions of legs similar although 4th pair notably shorter than preceeding legs. Dactyl similar length to propodus, propodus slightly longer than carpus, merus similar length to propodus. Propodus strongly prolongated into rounded articulation structure with dactyl. Dactyl with corneous terminal claw; dorsomesial row of low tubercles and less regularly arranged dorsal tubercles; two parallel rows of tubercles ventrally. Propodus, carpus and merus with irregularly sized tubercles, some acute, on dorsal surfaces. Dactyl and propodus with long plumose setae on all surfaces; carpus with plumose setae on dorsal and dorsolateral surfaces; merus with plumose setae on dorsal and ventral margins; setation sparse, apparently abraded, on holotype.

Abdomen of male (fig. 5h) with first segment short and broad, tapering slightly inwards to second segment which expands distally; segments 3 to 5 fused; segment 6 expanded distally; telson broader than long and obtusely triangular.

First pleopod of male (fig. 5i, j) slightly sinuous and evenly tapering, distal end with long plumose setae; tip elongate and recurved with apex expanded. Second pleopod of male (fig. 5k) less than half length of first, evenly curved; distal segment much shorter than penultimate, bladelike, curved.

Coloration (in life).— Cream and pale brown mottled with darker brown; colours largely obscured on smaller specimens by plumose setae. Fingers of chelipeds black, except for white or cream on tips, black extending some distance onto palm especially in large males.

Etymology.— Named from the Greek for "mixture", noun in apposition; referring to the mixture of characters of its congeners displayed by this species.

Remarks.— *Cymo cerasma* can be distinguished readily from its congeners by the ornamentaion of the carapace, coloration of the cheliped fingers and shape of the first pleopod of the male. *C. cerasma* resembles *C. deplanatus* A. Milne Edwards, *C. andreossyi* (Audouin) and *C. melanodactylus* De Haan in that the carapace front bears acute tubercles or spines. In *C. deplanatus*, the frontal spines are larger and less

numerous than in *C. cerasma*, the transverse row of tubercles across the protogastric region is absent, lateral carapace spines are very poorly developed and the large cheliped fingers are white or at least very pale. *C. andreossyi* similarly has the fingers of the large cheliped white, while *C. melanodactylus*, with black cheliped fingers, is relatively narrower across the carapace (Serène, 1984: pl. 2 fig. B). *C. quadrilobatus* Miers and *C. tuberculatus* Ortmann have rounded tubercles on the frontal margin producing a bilobate or quadrilobate effect. In both species, the carapace is longer than broad and the carapace and cheliped granules larger and more distinctly clustered than in *C. cerasma*. The first pleopod of the male of *C. cerasma* differs greatly from those of its congeners except for *C. quadrilobatus* in which the distal tip is similarly elongate.

Distribution.— Known from northwestern Australia and Papua New Guinea near Madang (pers. obs.).

Etisus anaglyptus H. Milne Edwards, 1834

Etisus anaglyptus H. Milne Edwards, 1834: 411; Guinot, 1964: 57, fig. 33a-c; McNeill, 1968: 65; Sakai, 1976: 456, fig. 246; Serène, 1984: 228, pl. 32A, text-fig. 137; Crosnier, 1987: 251.
Etisodes anaglyptus; A. Milne Edwards, 1873: 235; Haswell, 1882b: 55; Miers, 1884: 218.
Etisus (Etisodes) anaglyptus; Ward, 1932: 245; Sakai, 1939: 499, pl. 96 fig. 2.

Material.— ♂, 29.8x45.5 mm, Rob Roy Reef (stn 49), 8-9 m, coral and rubble, 15.vii.1988, WAM 923-88; ♂, 29.9x45.8 mm, Don Island (stn 50b), 8 m, sand and coral rubble, 16.vii.1988, WAM 941-88; ♀, 26.8x40.5 mm, west of Buffon Island (stn 85), 3-22 m, limestone and rubble, 23.vii.1988, RMNH D 37817.

Remarks.— *Etisus anaglyptus* is similar to *E. rhynchophorus* A. Milne Edwards, endemic to Japan, and *E. bargibanti* Crosnier of New Caledonia. The species generally can be distinguished by the characters noted by Serène (1984) and Crosnier (1987) but some points require comment. The Kimberley specimens agree well with descriptions and keys of *E. anaglyptus* (e.g. Guinot, 1964; Sakai, 1976). In particular, the second, small and blunt mesial carpal spine on the chelipeds distinguishes *E. anaglyptus* from the two species noted above. Serène (1984) and Crosnier (1987) noted the anterolateral teeth of *E. anaglyptus* to be smooth and lacking sharp granules, but several small acute denticles are present, especially between the last two teeth, on the Kimberley specimens. The dorsal surface of the carapace bears some elevated transverse striae, although these are not granular as in *E. rhynchophorus*. Crosnier (1987) noted that the first anterolateral tooth is smaller than the second in *E. anaglyptus* and subequal in *E. bargibanti*. On the Kimberley specimens the teeth may be similarly sized but the first is usually obtuse while the second is more acute.

The first pleopod of one Kimberley male (WAM 941-88) differs slightly from that illustrated by Guinot (1964) and Serène (1984) for *E. anaglyptus* in that apical setae are slightly longer and the distal lobe more distinctly recurved. In the second male (WAM 923-88) the pleopod agrees with the earlier figures.

Distribution.— Red Sea east to India, Sri Lanka, Japan, northeastern and now recorded from northwestern Australia.

Etisus demani Ohdner, 1925

Etisus demani Ohdner, 1925: 83; Gordon, 1941: 135, figs. 9, 10d; Guinot, 1964: 59, pl. 6 fig. 1, text-figs. 19, 24, 35; Takeda, 1971: 195, fig. 3C,D; Serène, 1984: 227, pl. 31F, text-figs. 140, 143a.

Material.— ♀, 3.4x4.3 mm, Long Reef, west edge (stn 58), to 15 m, coral, limestone, sand, 17.vii.1988, WAM 1025-88; 3 ♂♂, 10.3x14.0, 9.1x12.2, 8.8x11.8 mm, 2 ♀♀, 6.2x8.2, 6.1x8.1 mm, Fenelon Island (stn 64), 7-8 m, sand and coral, 18.vii.1988, WAM 47-89; ♀, 8.2x10.9 mm, Lafontaine Island (stn 68), 5-24 m, sand and rubble, 19.vii.1988, RMNH D 37818.

Remarks.— The first pleopod of males of these specimens agrees well with the illustrations for *E. demani* in Gordon (1941: fig. 10d) and, especially, Takeda (1971: fig. 3C, D). The apical lobe is rather more pronounced than that figured by Serène (1984: fig. 140). The species is easily distinguished from the similar *E. ohdneri* Takeda on the basis of this pleopod. The front of the carapace is similar to that illustrated by Serène (1984: fig. 143a), although slightly more projecting, and the lateral frontal lobes are far less pronounced than those illustrated by Gordon (1941: fig. 9d). Additionally, the spines on the ambulatory legs are smaller than figured by Gordon (1941: fig. 9a, b).

Distribution.— Red Sea east to Japan, Hawaiian and Samoan Islands, now recorded from northwestern Australia.

Euxanthus sculptilis Dana, 1852

Euxanthus sculptilis Dana, 1852a: 75; Dana, 1852b: 173; Dana, 1855: pl. 8 fig. 8a-d; Miers, 1884: 182; Guinot-Dumortier, 1960: 167, pl. 6 fig. 39, pl. 9 fig. 49; McNeill, 1968: 60; Serène, 1984: 84, pl. 11C, text-fig. 44.
Cancer huoni Jacquinot, 1852: pl. 4 fig. 1.
Euxanthus huoni; A. Milne Edwards, 1865: 290, pl. 15 fig. 1; Haswell, 1882b: 47; Miers, 1884: 182, 204.

Material.— ♂, 19.5x28.5 mm, Don Island (stn 50), 8 m, sand and coral rubble, 16.vii.1988, WAM 935-88; 2 carapaces, ?(broken)x45.9 mm, other very damaged, Irvine Island (stn 108), intertidal coral, 25.vii.1988, WAM 2019-88.

Distribution.— Red Sea east to Malaysia, Indonesia, to Tahitian Islands, northwestern to northeastern Australia.

Leptodius exaratus (H. Milne Edwards, 1834)

Chlorodius exaratus H. Milne Edwards, 1834: 402; Dana, 1852b: 208.
Leptodius exaratus; A. Milne Edwards, 1868: 71; Haswell, 1882b: 60; Forest & Guinot, 1961: 63, fig. 54; Sakai, 1976: 423, pl. 153 fig. 2; Serène, 1984: 183, pl. 26 fig. A, text-fig. 106.
Xantho exaratus; Ortmann, 1893: 445.
Xantho (Leptodius) exaratus; Alcock, 1898: 118; McNeill, 1968: 58.
Xantho hydrophilus; Montgomery, 1931: 435.

Material.— ♀, 8.6x12.7 mm, Heywood Islands (stn 14), mangal, 10.vii.1988, RMNH D 37819; ♂, 6.5x9.8 mm, 2 ♀♀, 9.4x14.1, 3.8x5.2 mm, Corneille Island (stn 65), intertidal, sand, rocks, near mangal, 19.vii.1988, WAM 5-89.

Remarks.— The form of the male first pleopod (Forest & Guinot, 1961: fig. 54 a, b; Serène, 1984: fig. 106) is distinctive.

Distribution.— Red Sea and East Africa, across Indian Ocean to Japan, Hawaii and northern Australia from Houtman Abrolhos Islands in the west to New South Wales in the east.

Leptodius spec.
(fig. 6b, c)

Material.— ♂, 8.0x12.3 mm, Slate Island (stn 5), intertidal, rocks and sand, 9.vii.1988, WAM 1045-88 ; 2 ♂♂, 7.8x12.5, 6.2x10.4 mm, 3 ♀♀, 5.9x8.9, 5.2x8.1, 5.2x7.9, East Montalivet Island (stn 50a), intertidal, 15.vii.1988, WAM 1046-88.

Remarks.— These small specimens could not be identified with certainty. They resemble *L. sanguineus* (H. Milne Edwards), a widespread species in the Indo-West Pacific including Australia (e.g. Grant & McCulloch, 1906) and *L. waialuanus* Rathbun from Hawaii in possessing five anterolateral teeth on the carapace. The last tooth is indistinct and little more than a granule, thus more closely resembling the *L. waialuanus* condition (Serène, 1984: 183). The teeth are granulated or minutely spinose. The first pleopod of males is at variance with those illustrated for all described species of *Leptodius* in lacking distinct mushroom-shaped tubercles on the apical lobe, bearing instead only curved spines (fig. 6b, c). This casts some doubt on the inclusion of these specimens in the genus *Leptodius* but the animals are small and it may be that the mushroom tubercles develop with age.

Liomera (*Liomera*) *venosa* (H. Milne Edwards, 1834)

Carpilius venosus H. Milne Edwards, 1834: 383.
Xantho obtusus De Haan, 1835: 47, pl. 13 fig. 5.
Carpilodes venosus; A. Milne Edwards, 1865: 227, pl. 12 fig. 2; Miers, 1884: 183, 213.
Carpilodes granulosus Haswell, 1882a: 751.
Carpilodes socius Lanchester, 1900: 731, pl. 44 fig. 4.
Liomera venosa; Sakai, 1965: 143, pl. 71 fig. 5; Sakai, 1976: 394, pl. 139 fig. 1.
Liomera (*Liomera*) *venosa*; Serène, 1984: 58, pl. 7D,E, fig. 18.

Material.— 1 spec., 12.7x20.9 mm, Bernouilli Island (stn 30), intertidal coral, 12.vii.1988, RMNH D 37820; ♂, 17.9x30.7 mm, Albert Island (stn 43), intertidal rocks, 14.vii.1988, WAM 2022-88; ♀, 15.2x26.2 mm, East Montalivet Island (stn 50a), intertidal rocks and sand, 15.vii.1988, WAM 992-88; ♀, 10.6x18.2 mm, west of Buffon Island (stn 85), 3-22 m, coral and rubble, 23.vii.1988, WAM 2-89.

Remarks.— The Kimberley specimens agree well with descriptions of *L. venosa* except for some differences in coloration. Fingers of the chelae of these animals are not brownish-black as noted by Serène (1984) and illustrated by Sakai (1976: pl. 139 fig. 1), but instead are a similar red-purple to the rest of the chelipeds and carapace, with the tips of the fingers paler. Dactyls of the ambulatory legs have white tips. There are a variable number of white dots on the carapace, as illustrated by Sakai (1976).

Distribution.— ? Mauritius, southeast Asia, Japan, Tahiti, northeastern and now northwestern Australia.

Pilodius granulatus Stimpson, 1858

Pilodius granulatus Stimpson, 1858: 34; Stimpson, 1907: 58, pl. 7 fig. 2; Sakai, 1976: 460, pl. 164 fig. 3; Serène, 1984: 233.

Chlorodopsis granulata; Nobili, 1907: 396; Sakai, 1936: 164, pl. 49 fig. 1; Sakai, 1939: 503, pl. 62 fig. 1, pl. 97 fig. 6, text-fig. 41; Serène and Luom, 1959: 307, pl. 1 fig. D, pl. 3 figs. C, F, text-fig. 1A.

? *Chlorodopsis granulatus*; Miers, 1884: 216, pl. 21 fig. A.

? *Chlorodopsis miersi* Ward, 1936: 4, pl. 2 figs. 1-3.

Material.— ♂ 5.9x9.0 mm, 4 ♀♀, 4.8x7.7-4.0x6.0 mm, Wildcat Reefs (stn 21), 7-22 m, limestone coral, 11.vii.1988, WAM 2020-88; 2 ♂♂, 5.9x8.9, 5.2x7.8 mm, 2 ♀♀, 5.1x7.8, 4.8x7.1 mm, Rob Roy Reef (stn 49), 8-9 m, coral, rubble, 15.vii.1988, RMNH D 37821; 2 ♀♀, 5.1x8.2, 4.7x7.2 mm, Long Reef, western edge (stn 58), to 15 m, limestone, coral, silt, 17.vii.1988, WAM 1043-88; ♀, 4.8x7.0 mm, Fenelon Island (stn 64), 7-8 m, sand and coral, 18.vii.1988, WAM 46-89.

Remarks.— *P. granulatus* differs from the similar *P. luomi* Serène in the form of the male first pleopod. The Kimberley specimens agree well with the figure of the pleopod for *P. granulatus* in Sakai (1939: fig. 41), although the tip appears slightly more acute and downturned on these animals. As noted by Serène (1984), the pleopod illustrated by Serène and Luom (1959: fig. 2 E, F) for *P. granulatus* is in fact that of *P. luomi*. Sakai (1939) recorded the carapace region 2M of *P. granulatus* as "not at all divided" but on these specimens the region is certainly incompletely divided as is clearly illustrated in Sakai's figures (1939: pl. 62 fig. 1, pl. 97 fig. 6; 1976: pl. 164 fig. 3). The black pigment encircling the palm of mature males quickly distinguishes the species from other congeners in northern Australia.

Distribution.— Hong Kong, Japan, possibly northeastern Australia and now definitely recorded from northwestern Australia.

Pilodius pilumnoides (White, 1847)

Chlorodius pilumnoides White, 1847a: 18; White, 1847c: 226.

? *Pilodius pilumnoides*; Dana, 1852b: 221; Dana, 1955: pl. 12 figs. 10a-c.

Chlorodopsis pilumnoides; Ortmann, 1893: 470; Sakai, 1939: 505, text-figs. 43a-c; Rathbun, 1923: 108; McNeill, 1926b: 309.

? *Chlorodopsis pilumnoides*; Serène and Luom, 1958: 89, 102, pls 1c, 3a (not pl. 4b); Serène and Luom, 1959: 302, pl. 1 fig. A, pl. 3 fig. A, text-fig. 5G (not fig. 2A).

Material.— ♀, 33.7x49.4 mm, Bernouilli Island (stn 30), intertidal, rocks and coral, 12.vii.1988, RMNH D 37822; ♂, 31.2x47.9 mm, east of Heywood Island (stn 102), 3-4 m, limestone and coral rubble, 24.vii.1988, WAM 2015-88.

Remarks.— The two large specimens agree well with earlier descriptions of *P. pilumnoides*. The short black setae on the carapace are rather sparse on both animals. The apical lobe of the first male pleopods is slightly straighter than that illustrated by Serène (1984: fig. 150), more like that of Sakai (1976: fig. 249b, b'). The pleopod illus-

trated by Serène and Luom (1958, 1959) for *P. pilumnoides* certainly is assignable to *P. maotieni* Serène.

Distribution.— Maldive Islands, Philippines, Indonesia, Japan, Queensland and now recorded from northwestern Australia.

Pilodius pubescens Dana, 1852

Pilodius pubescens Dana, 1852b: 217, pl. 12 fig. 6a-d; Forest and Guinot, 1961: 89; Serène, 1984: 233.
Chlorodopsis melanodactyla A. Milne Edwards, 1873: 229, pl. 7 fig. 7, 7a; Calman, 1900: 12; Serène and Luom, 1958: 125, pl. 2 D, pl. 3f, pl. 4g; Guinot, 1958: 180, fig. 23a, b.
Chlorodopsis melanodactylus; Miers, 1884: 531; Ward, 1932: 251.
Chlorodopsis pubescens; Serène and Luom, 1959: 316, figs. 1B, 2D, 5C.

Material.— 2 ♂♂, 5.1x7.7, 4.5x6.7 mm, Cassini Island (stn 59), intertidal rocks and coral, 18.vii.1988, WAM 2023-88.

Distribution.— East Africa to Southeast Asia, New Caledonia, Gilbert and Mariana Islands, northeastern and now recorded from northwestern Australia.

Trichia horiii (Miyake, 1940)

Zalasius horii Miyake, 1940: 27, pl. 1 fig.1.
Zalasius horiii; Sakai, 1976: 516, fig. 274.
Trichia horiii; Guinot, 1976: 119, pl. 4 figs. 5-9, text-figs. 24A, E, 25A, 26E, F, 27B, 29F-L.

Material.— ♀, 46.4x63.2 mm, Careening Bay (stn 41), intertidal, rocks and sand, 13.vii.1988, WAM 122-89.

Remarks.— The elongate buccal cavity with the merus of the third maxillipeds distinctly longer than broad and its anterolateral angle rounded confirm this as a species of *Trichia* rather than *Banareia* or *Calvactaea* (Serène, 1984: 36). The lateral margins of the carapace are entire, without indication of lobes, carapace regions are granulate and separated by shallow groves and almost the entire surface of the animal except for mesial faces of the pereiopods is covered with long, thick setae. The specimen agrees well with the above descriptions of *T. horiii*, in particular the redescription and discussion by Guinot (1976).

Distribution.— Japan, Palau Islands, Indonesia, Solomon Islands, northwestern Australia.

Xanthias cf. *elegans* (Stimpson, 1858)

Xanthodes elegans Stimpson, 1858: 33; Stimpson, 1907: 47, pl. 5 fig. 3.
Xanthodes atromanus Haswell, 1882a: 542; Haswell, 1882b: 49, pl. 1 fig. 1; Grant & McCulloch, 1906: 12.
Xanthias elegans; Rathbun, footnote in Stimpson, 1907: 47; Sakai, 1936: 155, pl. 47 fig. 1; Forest & Guinot, 1961: 76, fig. 72; Griffin, 1972: 79; Serène, 1984: 191.
Xanthias atromanus; Rathbun, 1914: 659; McNeill, 1926b: 313.
Paraxanthias elegans; Ohdner, 1925: 84; Montgomery, 1931: 441; Sakai, 1939: 470, pl. 60 fig. 1, pl. 91 fig.

7; Sakai, 1976: 430, pl. 155 fig. 2, text-fig. 226.

Material.— ♂, 5.1x7.2 mm, west of Buffon Island (stn 85), 3-22 m, coral, rubble, 23.vii.1988, WAM 4-89.

Remarks.— The small specimen agrees well with previous descriptions and figures of *X. elegans* but some differences are evident in setation of the first pleopod. The pleopod of *X. elegans* bears several (ca. 13) long plumose setae at the apex (Forest & Guinot, 1961: fig. 72) while the first pleopods of this specimen bear three and four plumose setae. Otherwise, structure of the pleopods is similar to *X. elegans* with a distinctly recurved distal tip. It is possible that the paucity of long setae is an allometric effect but a specific difference can not be ruled out.

Distribution.— Japan, Taiwan, Norfolk Island, northern Australia from Houtman Abrolhos Islands in the west to Sydney in the east.

Trapeziidae Miers, 1886

Tetralia glaberrima obscura Patton, 1966

Tetralia glaberrima forma *obscura* Patton, 1966: 287.
Tetralia glaberrima obscura; Serène, 1984: 283, pl. 40E.

Material.— 2 ♂♂, 8.4x9.2, 4.8x5.5 mm, 3 ♀♀, 5.0x5.9, 3.5x4.3, 3.3x4.3 mm, Wildcat Reefs (stn 21), 7-22 m, coral and limestone, 11.vii.1988, RMNH D 37776; 6 ♂♂, 8.1x8.7-4.9x5.5 mm, 4 ♀♀ (3 ovig.), 8.5x10.1-4.2x4.9 mm, Rob Roy Reef (stn 49), 8-9 m, coral and limestone, 15.vii.1988, WAM 1017-88; ♂, 7.7x8.7 mm, ♀ (ovig.), 9.3x11.0 mm, Don Island (stn 50b), to 8 m, coral and rubble, 16.vii.1988, WAM 930-88; ♂, 6.2x7.2 mm, Long Reef, west edge (stn 58), to 15 m, coral and limestone, 17.vii.1988, WAM 1003-88; ♂, 8.0x8.9 mm, o, 8.3x9.9 mm, Long Reef, southwest edge (stn 60), to 15 m, coral and rubble, 18 July 1988, RMNH D 37775; ♀ (ovig.), 6.7x7.9 mm, west of Buffon Island (stn 85), 3-22 m, 23.vii.1988, WAM 2127-88; ♂, 9.9x10.9 mm, ♀, 9.4x10.7 mm, Lucas Island (stn 101), 3-29 m, sand, coral, limestone, 24.vii.1988, WAM 116-89.

Remarks.— The most common trapeziid in the Kimberley area, *T. glaberrima obscura* is readily recognised in the live state by the irridescent blue line bordering the black or dark brown frontal band (Serène, 1984). This metallic line can fade in preservative. The dark frontal band is usually relatively broader in small specimens than in large thus converging towards the condition of *T. glaberrima nigrifrons* Dana. None of the Kimberley animals displayed a dark spot on the carpus of pereiopods, as noted for *T. g. nigrifrons* by Serène (1984).

Distribution.— Northeastern and now recorded from northwestern Australia.

Trapezia cymodoce (Herbst, 1799)

Cancer cymodoce Herbst, 1799: 22, pl. 51 fig. 5.
Trapezia cymodoce; Savigny, 1809: pl. 5 fig. 2; Haswell, 1882b: 76; Miers, 1884: 535; McNeill, 1926b: 314; Patton, 1966: 285; McNeill, 1968: 68; Sakai, 1976: 507, pl. 181 fig. 1, pl. 184 fig. 1.; Black & Prince, 1983: 140; Serène, 1984: 272, pl. 38B, text-fig. 179.
Trapezia dentifrons Latreille, 1825: 695.
Trapezia coerulea Rüppell, 1830: 27, pl. 5 fig. 7, pl. 6 fig. 22.
Trapezia hirtipes Jacquinot, 1852, pl. 4 fig. 14.

Material.— 2 ♂♂, 12.5x15.2, 8.3x10.2 mm, 3 ♀♀, 11.9x14.6 (parasitised by epicaridean), 8.3x10.1, 7.6x9.4 mm (ovig.), Condillac Island (stn 54b), to 10 m, coral, sand, 16.vii.1988, WAM 998-88; ♂, 12.3x15.0 mm, ♀, 13.0x15.9 mm, Long Reef, west edge (stn 58), to 15 m, coral, limestone, 17.vii.1988, RMNH D 37774.

Remarks.— All specimens were violet in colour in life with a transverse row of red dots, largest medially, running across the carapace to between the external orbital angle and the epibranchial spine and thence curving posteriorly to about level with the epibranchial spine. These dots were not recorded for the species by Serène (1984) but were noted by other workers (e.g. McNeill, 1968; Sakai, 1976).

Distribution.— Red Sea and east Africa, east to Japan, Hawaiian Islands and Polynesia, Australia from Rottnest Island in the southwest, across the north and northeast to central coastal Queensland.

Trapezia guttata Rüppell, 1830

Trapezia guttata Rüppell, 1830: 27; Forest & Guinot, 1961: 136, figs. 134, 139a, b; Sakai, 1976: 508, pl. 183 fig. 3, text-fig. 270; Serène, 1984: 271, pl. 38A, text-fig. 178.
Trapezia ferruginea guttata; Ortmann, 1897: 205.
Trapezia cymodoce guttata; Gordon, 1934: 59.
Trapezia davaoensis Ward, 1941: 14, fig. 27.
Trapezia ferruginea forma *guttata*; Patton, 1966: 285.

Material.— ♂, 7.7x9.2 mm, Rob Roy Reef (stn 49), 8-9 m, coral, 15.vii.1988, RMNH D 37773; ♂, 6.9x8.5 mm, ♀ (ovig.), 8.2x10.5 mm, Long Reef, west edge (stn 58), to 15 m, coral, limestone, 17.vii.1988, WAM 1022-88.

Distribution.— Red Sea and East Africa, eastern to southeastern Asia, Japan, Palau and Tahitian Islands, northeastern and now recorded from northwestern Australia.

Trapezia septata Dana, 1852

Trapezia septata (var.?) Dana, 1852b: 260.
Trapezia reticulata Stimpson, 1858: 37; Stimpson, 1907: 73, pl. 9 fig. 5.
Trapezia septata; Galil & Lewinsohn, 1985: 288, figs. 2, 5, 6.

Material.— ♂, 8.5x10.1 mm, Long Reef, west edge (stn 58), to 15 m, coral, limestone, 17.vii.1988, WAM 1008-88.

Remarks.— The species *T. septata* was resurrected by Galil & Lewinsohn (1985) after more than 100 years of confusion regarding its identify. They observed that *T. septata* is in fact more widespread than the more frequently recorded *T. areolata* Dana and included most records of the latter in the synonymy of *T. septata*. These included the records of *T. areolata* in Australian waters by Ward (1932) and Patton (1966, 1974). My examination of specimens identified as *T. areolata* by Black & Prince (1983) revealed that they too are *T. septata*. It is likely that *T. areolata* does not occur in Australian waters.

Distribution.— Sri Lanka east to Japan, Taiwan, southeastern Asia, New

Caledonia, Samoa, New Guinea, Australia from Rottnest Island in the west, north and east to central coastal Queensland.

Menippidae Ortmann, 1893
Epixanthus dentatus (White, 1847)

Panopeus dentatus White, 1847a: 18; White, 1847c: 226; Miers, 1884: 213.
Heteropanope dentatus; Stimpson, 1858: 35.
Panopeus acutidens Haswell, 1882b: 51, pl. 1 fig. 2.
Epixanthus dentatus; Alcock, 1898: 185; Rathbun, 1924: 19; Sakai, 1976: 476, pl. 169 fig. 3; Davie, 1982: 207; Crosnier, 1984: 307, pl. 45E, text-figs. 220, 221.

Material.— Carapace, 23.4x38.2 mm, Coronation Island (stn 38), mangal, 13.vii.1988, WAM 1019-88; carapace, ? (broken)x55.7 mm, Descartes Island (stn 71), intertidal, 20.vii.1988, WAM 109-89; 4 ♂♂, 32.3x53.7-24.5x41.0 mm, Hunter River estuary (stn 81), mangal with rocks, 22.vii.1988, WAM 2128-88 (2), RMNH D 37752 (2).

Coloration (in life).— Carapace marbled in red and white, fingers of large chela white or cream.

Remarks.— Fingers of the large chela are paler than illustrated by Sakai (1976: pl. 169 fig. 3).

Distribution.— East Africa east to Indonesia, Philippines, Japan, Fiji Islands, northern Australia.

Epixanthus frontalis (H. Milne Edwards, 1834)

Ozius frontalis H. Milne Edwards, 1834: 406.
Epixanthus frontalis; Heller, 1865: 20; Sakai, 1939: 519, pl. 98 fig. 4, text-fig. 47: McNeill, 1968: 76; Sakai, 1976: 474, pl. 169 fig. 2, text-fig. 254; Davie, 1982: 207; Crosnier, 1984: 307, pl. 45F, text-figs. 222, 223; Davie, 1985: 266.
Epixanthus kotschii Heller, 1861b: 325, pl. 1 fig 14.
Ozius (*Epixanthus*) *frontalis*; Miers, 1884: 517, 534.

Material.— ♀, 10.4x16.8 mm, Entrance Island (stn 25), intertidal rocks, 12.vii.1988, WAM 1031-88; ♂, 12.1x19.3 mm, Careening Bay (stn 41), intertidal rocks and sand, 13.vii.1988, WAM 1032-88; 3 ♂♂,9.6x15.6, 7.4x11.9, 5.0x7.9 mm, ♀, 15.1x24.9 mm, Corneille Island (stn 65), mangal with rocks, 19.vii.1988, RMNH D 37753.

Distribution.— Red Sea and East Africa east to India, Philippines, Thailand, Japan, New Caledonia, northwestern and northeastern Australia.

Pilumnidae Samouelle, 1819
Actumnus elegans De Man, 1887

Actumnus elegans De Man, 1887b: 47; Chopra & Das, 1937: 408, figs. 12, 13; Takeda & Miyake, 1969: 97, figs. 1, 2d-f.

Material.— ♀, 3.8x4.7 mm, Rob Roy Reef (stn 49), 8-9 m, coral and rubble, 15.vii.1988, WAM 206-89.

Remarks.— This small specimen agrees with descriptions of the species in the poor areolation and approximately eight or nine posterolateral granules of the carapace, and the irregular rows of tubercles on dorsal margins of the propodus and carpus of the ambulatory legs.

Distribution.— Mergui Archipelago, Burma, Japan, now recorded from northwestern Australia.

Actumnus setifer (De Haan, 1835)

Cancer (Pilumnus) setifer De Haan, 1835: 50, pl. 3 fig. 3.
Actumnus tomentosus Dana, 1852b: 243; Dana, 1855: pl. 14 fig. 2a-c; Haswell, 1882b: 73; Grant & McCulloch, 1906: 17; Rathbun, 1924: 20.
Actumnus setifer; A. Milne Edwards, 1865: 287, pl. 15 fig. 5, 5b; Miers, 1884: 225; Ortmann, 1894: 52; Grant & McCulloch, 1906: 17; Rathbun, 1914: 660; Rathbun, 1924: 20; Hale, 1927: 167; Balss, 1933: 38; McNeill, 1968: 64; Takeda & Miyake, 1969: 115, fig. 9d-f; Campbell & Stephenson, 1970: 285, fig. 46; Sakai, 1976: 496, pl. 177 fig. 2.

Material.— ♀, 9.2x12.6 mm, Condillac Island (stn 54b), to 10 m, coral and rubble, 16.vii.1988, WAM 207-89; ♀, 10.8x14.7 mm, west of Buffon Island (stn 85), 3-22 m, coral and rubble, 23.vii.1988, WAM 2135-88.

Remarks.— I have accepted the synonymy of *A. setifer* and *A. tomentosus* Dana as proposed by Miers (1884) and supported by many subsequent workers (e.g. Takeda & Miyake, 1969) although several authors have identified both nominal species from the same Australian localities (e.g. Grant & McCulloch, 1906; Rathbun, 1924).

Distribution.— Red Sea and East Africa, eastern to southeastern Asia, Japan, Fiji, Tahiti, most Australian shores (possibly circum-Australian).

Parapilumnus pisifer (McLeay, 1838)

Halimede pisifer McLeay, 1838: 60.
Pilumnus verrucosipes Stimpson, 1858: 36; Stimpson, 1907: 67, pl. 8 fig. 5.
Parapilumnus pisifer; Barnard, 1947: 365; Barnard, 1950: 269, fig. 49i,j; Takeda & Miyake, 1969: 150.

Material.— ♀, 3.0x4.2 mm, Albert Island (stn 43), intertidal rocks, 14.vii.1988, WAM 2134-88.

Remarks.— The single specimen differs slightly from the illustrations of Barnard (1950). The first two anterolateral teeth are more rounded than shown by Barnard, but still granular, and the last tooth is slightly smaller than in his figure. The infraorbital border is roughly dumb-bell shaped as noted by Barnard.

P. pisifer is similar to *P. coralliophillus* Takeda & Miyake from Japan. The present specimen is recognisable as *P. pisifer* by the tomentum on the carapace, the larger third anterolateral tooth and the shape of the infraorbital border.

Distribution.— Southern and western Africa, now recorded from Australia.

Pilumnus bleekeri Miers, 1880
(fig. 6d, e)

Pilumnus bleekeri Miers, 1880: 235; Miers, 1884: 220.

Material.— ♂, 24.0x33.5 mm, 3 ♀♀, 18.4x26.5, 18.1x25.2 (ovig.), 13.3x18.4 mm, Bernouilli Island (stn 30), intertidal rocks and coral, 12.vii.1988, WAM 205-89.

Remarks.— *P. bleekeri* is a rarely recorded species with long, stiff yellow setae, prominent curved lateral spines, a small distal spinule or denticle on the merus and carpus of the ambulatory legs and a male first pleopod with very recurved apex (fig. 6d, e). The last closely resembles the pleopod of *P. guinotae* Takeda & Miyake (1968: fig. 12d-f).

Distribution.— New Guinea, now recorded from northwestern Australia.

Pilumnus minutus De Haan, 1835

Cancer (Pilumnus) minutus De Haan, 1835: 50, pl. 3 fig. 2.
Pilumnus hirsutus Stimpson, 1858: 37; Stimpson, 1907: 69, pl. 9 fig. 1.
Pilumnus minutus; A. Milne Edwards, 1873: 250; Sakai, 1939: 535, pl. 64 fig. 2, pl. 100 fig. 9, text-fig. 53a,b; McNeill, 1968: 63; Takeda & Miyake, 1968: 40, fig. 9d,e; Campbell & Stephenson, 1970: 282, fig. 47; Sakai, 1976: 487, pl. 174 fig. 2, text-fig. 260.

Material.— 2 ♂♂, 5.7x7.4, 4.4x6.4 mm, ♀, 4.9x7.1 mm, Slate Island (stn 5), intertidal rocks and sand, 9.vii.1988, WAM 211-89; ♂, 4.2x6.3 mm, Albert Island (stn 43), intertidal, 14.vii.1988, WAM 212-89; 2 ♂♂, 4.7x6.6, 4.5x6.5 mm, 3 ♀♀, 4.5x6.5, 4.1x5.7, 4.0x5.6 mm (ovig.), East Montalivet Island (stn 50a), intertidal rocks and sand, 15-16.vii.1988, WAM 213-89; ♂, 8.0x10.8 mm, Fenelon Island (stn 64), 7-8 m, coral, sand, 18 July 1988, WAM 49-89.

Distribution.— Japan, southeast Asia (uncertainly from East Africa and Red Sea), northeastern and now recorded from northwestern Australia.

Pilumnus pulcher Miers, 1884

Pilumnus pulcher Miers, 1884: 219, pl. 22 fig. A; Miers, 1886: 161; Calman, 1900: 15; Rathbun, 1924: 19; Montgomery, 1931: 446, pl. 25 fig. 2; Balss, 1933: 26, pl. 6 fig. 31; Takeda & Miyake, 1968: 17, pl. 1C, text-fig. 4a-c.

Material.— 4 ♂♂, 22.9x31.3-18.5x25.4 mm, Cassini Island (stn 59), intertidal rocks and coral, 18.vii.1988, WAM 2133-88.

Distribution.— Northern Australia from Cape Jaubert east to Torres Strait.

Pilumnus vespertilio (Fabricius, 1793)

Cancer vespertilio Fabricius, 1793: 463.
Pilumnus vespertilio; A. Milne Edwards, 1873: 242; Haswell, 1882b: 65; Miers, 1884: 219; Balss, 1933: 21; Takeda & Miyake, 1968: 22; McNeill, 1968: 63; Sakai, 1976: 484, fig. 258.
Pilumnus ursulus Adams & White, 1848: 45, pl. 9 fig. 6.
Actaea dentata Edmondson, 1935: 29, pl. 1 fig. B, text-fig. 9.

Material.— ♂, 20.5x29.3 mm, 3 ♀♀, 19.0x25.0, 13.7x19.8, 12.9x18.4 mm, Slate Island (stn 5), intertidal

rocks and sand, 9.vii.1988, WAM 996-88; ♀, 16.9x12.5 mm, Jackson Island (stn 24), intertidal rocks, 11.vii.1988, RMNH D 37754; ♂, 14.4x19.7 mm, 2 ♀♀, 16.3x22.8, 6.3x9.1 mm, Careening Bay (stn 41), intertidal rocks, 13.vii.1988, RMNH D 37755; ♀, 19.8x27.1 mm, Prudhoe Islands (stn 75), intertidal, 21.vii.1988, WAM 2130-88; 3 ♂♂, 21.5x30.7, 13.6x19.0, 14.6x20.1 mm, ♀, 22.7x30.6 mm, Shirley Island (stn 115), intertidal rocks, 26.vii.1988, WAM 2131-88.

Remarks.— *P. vespertilio* was the most commonly seen pilumnid during the Kimberley expedition.

Distribution.— Red Sea, eastern and southern Africa, eastern to southeastern Asia, Japan, Solomon and Hawaiian Islands, northern Australia from Barrow Island in the west to Sydney in the east.

Goneplacidae MacLeay, 1838
Eucrate haswelli Campbell, 1969

Eucrate haswelli Campbell, 1969: 130, figs. 2, 5.

Material.— ♀, 10.4x13.2 mm, Careening Bay (stn 41), intertidal, 13.vii.1988, WAM 1030-88.

Remarks.— The female agrees well with the description of the holotype male (Campbell, 1969).

Distribution.— Port Denison, Queensland, and now recorded from northwestern Australia.

Typhlocarcinops tonsurata Griffin & Campbell, 1969
(fig. 6a)

Typhlocarcinops tonsurata Griffin & Campbell, 1969: 147, fig. 3.

Material.— 2 ♂♂, 6.4x7.8, 6.2x7.7 mm, ♀, 8.2x10.7 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, WAM 37-89.

Remarks.— *T. tonsurata* was described from Moreton Bay, Queensland, on the basis of one male specimen. The Kimberley specimens agree well with the holotype description. Griffin & Campbell (1969) adequately distinguished the species from similar congeners, particularly resolving confusion regarding *T. decrescens* Rathbun.

The original description included illustration of the male pleopod (Griffin & Campbell, 1969: fig. 6B) but this was fractured, and is redrawn here from the larger Kimberley male for reference (fig. 6a).

Distribution.— Southeastern Queensland and now recorded from northwestern Australia.

Atelecyclidae Ortmann, 1893
Kraussia integra (De Haan, 1835)

Cancer (Xantho) integra De Haan, 1835: 66, pl. 18 fig. 6.

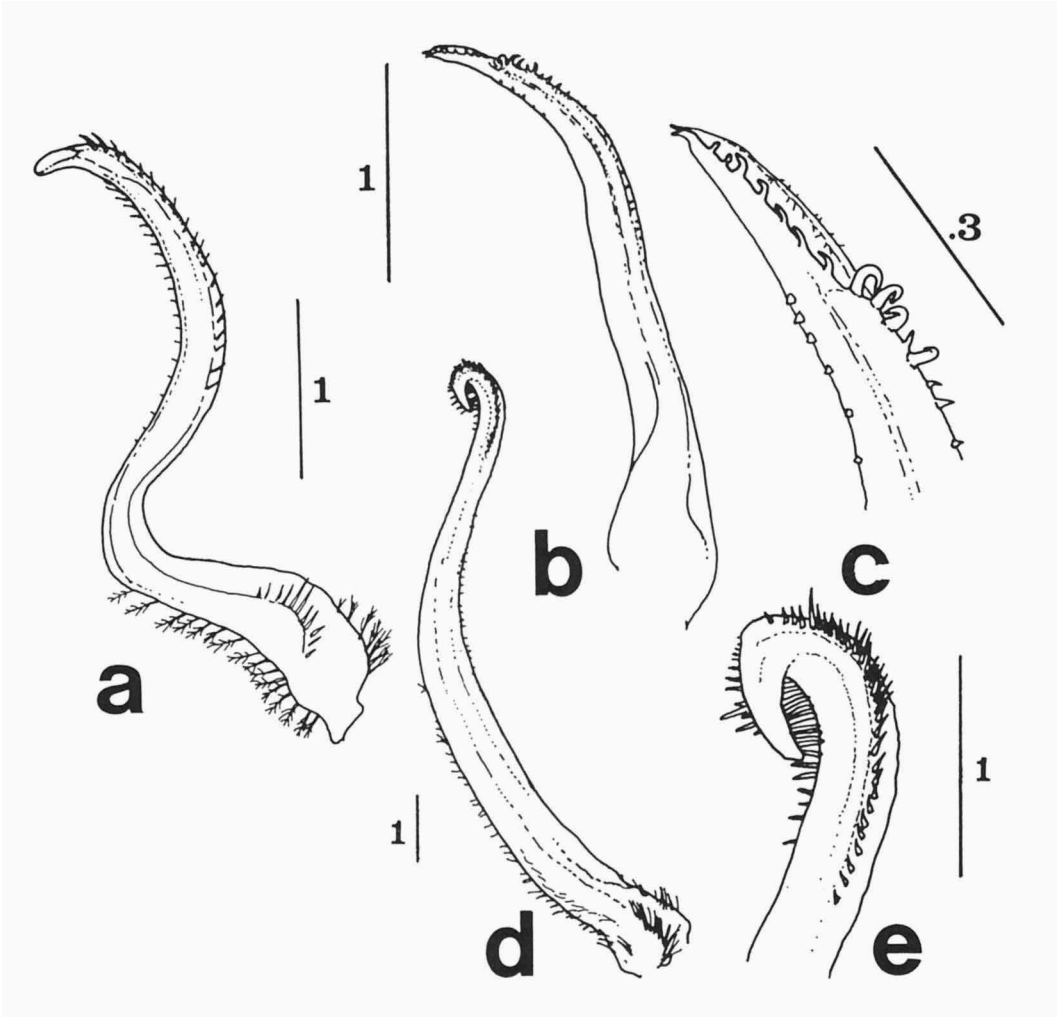

Fig. 6. First pleopods of males. a, *Typhlocarcinops tonsurata*, 6.4x7.8 mm, WAM 37-89; b, c, *Leptodius* sp., 7.8x12.5 mm, WAM 1046-88; d, e, *Pilumnus bleekeri*, 24.0x33.5 mm, WAM 205-89. Scales in mm.

Kraussia integra; Alcock, 1899: 97; Sakai, 1939: 429, pl. 52 fig. 1; Sakai, 1976: 308, fig. 172a.

Material.— ♂, 9.9x11.3 mm, ♀, 6.7x7.5 mm, west of Buffon Island (stn 85), 3-22 m, sand, coral, rubble, limestone, 23.vii.1988, WAM 38-89.

Remarks.— Sakai (1974) established a new species, *K. truncatifrons*, very similar to *K. integra* in most characters. The present specimen agrees with descriptions of *K. integra* although the front is only weakly quadrilobate with frontal lobes less deeply incised than illustrated by Sakai (1976: fig. 172a).

Distribution.— Philippines, Andaman Islands, Japan, now recorded from Australia.

Grapsidae MacLeay, 1838
Grapsus albolineatus Lamarck, 1818

Cancer strigosus; Herbst, 1799: 55, pl. 47 fig. 7 (not *Cancer strigosus* Linnaeus, 1761).
Grapsus albo-lineatus Lamarck, 1818: 249.
Grapsus strigosus; H. Milne Edwards, 1837: 87; Haswell, 1882b: 97; Miers, 1884: 544; Sakai, 1939: 650, pl. 106 fig. 3.
Goniopsis strigosa; Heller, 1861a: 31.
Grapsus albolineatus; Holthuis, 1958: 48, fig. 4b; Banerjee, 1960: 147, figs. 1c, 2o,p, 3a,f; McNeill, 1968: 77; Sakai, 1976: 630, pl. 215; Holthuis, 1977: 145.

Material.— ♀ (ovig.), 43.6x49.0 mm, Condillac Island (stn 54), intertidal rocks, 16.vii.1988, WAM 949-88.

Distribution.— Red Sea and East Africa, east to Japan, Indonesia, Polynesia and Hawaii, northwestern, northern and northeastern Australia.

Metopograpsus frontalis Miers, 1880

Metopograpsus messor frontalis Miers, 1880: 311.
Metopograpsus messor gracilipes De Man, 1891: 49, pl. 4 fig. 14.
Metopograpsus gracilipes; Tweedie, 1949: 470, fig. 1g.
Metopograpsus frontalis; Banerjee, 1960: 174, 182, figs. 5e, 6b-e; Forest & Guinot, 1961: 157; McNeill, 1968: 80; Davie, 1982: 206.

Material.— 3 ♀♀, 8.4x11.7, 7.7x10.8, 7.4x10.4 mm, Heywood Islands (stn 14), mangal, 10.vii.1988, WAM 1011-88; ♀, 14.4x20.3 mm, Bernouilli Island (stn 30), intertidal, mud, sand, mangal, 12.vii.1988, WAM 31-89; ♂, 7.7x10.8 mm, ♀, 12.6x16.9 mm, Careening Bay (stn 41), intertidal, 13.vii.1988, RMNH D 37768; ♀ (exuvia), East Montalivet Island (stn 50a), intertidal, rocks and sand, 15.vii.1988, WAM 1038-88; 2 ♂♂, 14.8x19.4, 9.3x12.7 mm, Corneille Island (stn 65), intertidal, sand, some rocks, mangal, 19.vii.1988, WAM 30-89; ♂, 15.1x20.2 mm, ♀, 15.7x? (broken), Descartes Island (stn 71), intertidal, sand, mangal, some rocks, 20.vii.1988, WAM 113-89; ♀, 17.6x23.2 mm, Prudhoe Islands (stn 75), intertidal, sand, rocks, 21.vii.1988, WAM 32-89; ♂, 19.9x25.4 mm, Anderdon Islands (stn 84), intertidal rocks, 22.vii.1988, WAM 114-89; ♂, ? (broken)x24.2 mm, Shirley Island (stn 115), intertidal, sand, rocks, 26.vii.1988, RMNH D 37769.

Remarks.— The differences between this species and the similar *M. messor* (Forskål), a species confined to the western Indian Ocean, have been discussed by Tweedie (1949) and McNeill (1968). The records of *M. messor* from Koolan Island by McCulloch (1918) and from Broome by Rathbun (1924) almost certainly refer to *M. frontalis*.

Distribution.— Some uncertainty due to probable confusion with *M. messor*; western Pacific including Japan, northern Australia from Broome east to north Queensland.

Metopograpsus latifrons (White, 1847)

Grapsus latifrons White, 1847d: 337, pl. 2 fig. 2.
Metopograpsus latifrons; H. Milne Edwards, 1853: 166; Tesch, 1918: 81; Tweedie, 1949: 468, fig. 1a; Davie, 1982: 206.

Metopograpsus maculatus H. Milne Edwards, 1853: 165; Tesch, 1918: 80.
Metopograpsus pictus A. Milne Edwards, 1867: 283.

Material.— ♂ 29.0x34.1 mm, Descartes Island (stn 71), intertidal, mud, mangal with some rocks, 20.vii.1988, WAM 112-89.

Remarks.— The very distinctive male first pleopod and proportions of the third walking leg (Tweedie, 1949) make identification of this species unambiguous. The single specimen was collected sympatric with *M. frontalis*.

Distribution.— Singapore, Indonesia, New Guinea, northern and now recorded from northwestern Australia.

Sesarma (Chiromantes) messa Campbell, 1967

Sesarma (Chiromantes) messa Campbell, 1967: 10, pl. 3, text-figs. 1C, 2C; Davie, 1982: 207.

Material.— ♂, 15.0x18.4 mm, Corneille Island (stn 65), intertidal, sand, some rocks, mangal, 19.vii.1988, WAM 29-89.

Remarks.— The specimen agrees most closely with *S. messa* as described by Campbell (1967) and is almost certainly that species. However, the medial expansion of the second abdominal segment is somewhat less pronounced than in other specimens I have examined.

Distribution.— Northeastern Australia from Moreton Bay to Thursday Island, now recorded from northwestern Australia.

Sesarma (Neoepisesarma) brockii De Man, 1887

Sesarma brockii De Man, 1887: 651.
Sesarma (Sesarma) brockii; De Man, 1902: 516; Tweedie, 1936: 50.
Neoepisesarma (Selatium) brocki; Serène & Soh, 1970: 397, pl. 4 figs. A, B.
Sesarma (Neoepisesarma) brocki; Davie, 1982: 207.

Material.— ♂, 21.4x24.3 mm, Hunter River estuary (stn 81), mangal, mud, 22.vii.1988, WAM 28-89.

Remarks.— The name *Neoepisesarma* is employed here as a subgenus, rather than the generic rank assigned by Serène and Soh (1970). In this conservative retention of *Sesarma* as the genus I follow several recent publications (e.g. Abele, 1981; Davie, 1982; Davie, 1985).

Distribution.— Southeast Asia, including Singapore, northern Australia from Kimberleys to southeast Queensland.

Mictyridae Dana, 1851

Mictyris aff. *longicarpus* Latreille, 1806

Mictyris longicarpus Latreille, 1806: 40; Grant & McCulloch, 1906: 23; Rathbun, 1914: 661; McNeill, 1926a: 102, pl. 9 figs. 1, 2, text-fig. 1; McNeill, 1926b: 316; McNeill, 1968: 83; Griffin, 1972: 87;

Sakai, 1976: 627, pl. 213 figs. 1-3.
Myctiris longicarpus; White, 1847a: 34; Dana, 1852b: 389; Stimpson, 1858: 99.
Myctiris brevidactylus Stimpson, 1858: 99; Stimpson, 1907: 103, pl. 13 fig. 4.
Mycteris longicarpus; Haswell, 1882b: 116; Miers, 1884: 248; Whitelegge, 1889: 230.
Mictyris "W.A." Davie, 1982: 206.

Material.— 6 ♂♂, 15.4x13.0-11.6x10.4 mm, 2 ♀♀, 11.5x10.3-11.3x9.7 mm, northwest of Uwins Island (stn 29), intertidal sand, 12.vii.1988, WAM 2125-88; 9 specs, 14.2x12.2-11.7x10.0 mm, Shirley Island (stn 115), intertidal sand, 26.vii.1988, WAM 2124-88 (6), RMNH D 37737(3).

Remarks.— The genus was reviewed by McNeill (1926a), including a comprehensive synonymy and history of *M. longicarpus*. Since then, Davie (1982) noted that *M. longicarpus* is in fact a species complex and that representatives in Western Australia comprise a new and as yet undescribed species. Davie (1985) proposed that all Australian species of *Mictyris* are endemic but his revision is yet to be published.
Distribution.— Assuming Davie (1982, 1985) to be correct, species endemic to Western Australia. If conspecific with *M. longicarpus*, India, Philippines, Malaysia, Hong Kong, Japan, New Guinea, Australia from Perth in the southwest, across the north and south to eastern Victoria.

Ocypodidae Rafinesque, 1815

Macrophthalmus (Macrophthalmus) crassipes H. Milne Edwards, 1852

Macrophthalmus crassipes H. Milne Edwards, 1852: 157; Haswell, 1882b: 89; Rathbun, 1924: 12; Barnes, 1968: 71; Campbell & Stephenson, 1970: 292; Davie, 1982: 206.
Macrophthalmus (Macrophthalmus) crassipes; Barnes, 1967: 208, pl. 1b, text-fig. 2; Barnes, 1971: 9.

Material.— ♀, 7.1x15.7 mm, Heywood Islands (stn 14), mangal, 10.vii.1988, WAM 988-88.

Remarks.— As noted by Barnes (1967), Rathbun's (1924) record of *M. sandakani* Rathbun from Cape Jaubert, south of Broome, probably refers to *M. crassipes*.
Distribution.— Malaysia, Thailand, China, New Guinea, Caroline Islands, northern and eastern Australia from south of Broome east to Sydney.

Macrophthalmus (Macrophthalmus) milloti Crosnier, 1965

Macrophthalmus milloti Crosnier, 1965: 124, pl. 11 fig. 4, text-figs. 217-220, 222, 223, 228.
Macrophthalmus (Macrophthalmus) milloti; Barnes, 1967: 203; Serène, 1973: 112, pl. 4 figs. A-C.

Material.— ♀, 6.6x11.0 mm, Port George IV (stn 26), 5 m, sand, 12.vii.1988, RMNH D 37767; ♂, damaged, Descartes Island (stn 71), intertidal, 20.vii.1988, WAM 108-89; ♂, 8.7x15.8 mm, Shirley Island (stn 115), intertidal sand, 26 July 1988, WAM 25-89.

Remarks.— As discussed by Serène (1973), *M. milloti* has been confused frequently with *M. telescopicus* (Owen). Serène (1973) suggested that both species may occur in Australia, together with the similar *M. verreauxi* H. Milne Edwards. The three species share long ocular peduncles projecting beyond the external orbital angle and

three anterolateral teeth on the carapace. *M. milloti* can be distinguished by the presence of numerous sharp spines on the mesial face of the palm of the chelae and by the short chitinous apex on the male gonopod (Crosnier, 1965: text-fig. 228).

On the larger male examined, one cheliped is slightly smaller than the other and the dactyl of this smaller chela lacks the proximal tooth on the cutting edge.

Distribution.— Madagascar east to Andaman Islands, Singapore, now confirmed from northwestern Australia.

Ocypode ceratophthalma (Pallas, 1772)

Cancer ceratophthalmus Pallas, 1772: 83, pl. 5 figs. 7, 8.
Ocypoda ceratophthalma; Haswell, 1882b: 94; Grant & McCulloch, 1906: 20.
Ocypode ceratophthalmus; Barnard, 1950: 86, fig. 17c, d; Crosnier, 1965: 93, pl. 8 fig. 1, pl. 10 fig. 3, text-figs. 152, 160, 167, 168; Jones, 1988: 33.
Ocypode ceratophthalma; Edmondson, 1962: 15, figs. 6a, 7a; George & Knott, 1965: 17, fig. 2B; McNeill, 1968: 85; Sakai, 1976: 600, pl. 207, text-fig. 327b.

Material.— 1 juv., 5.9x7.0 mm, Heywood Islands (stn 11), intertidal sand, 10.vii.1988, WAM 22-89; 1 juv., 6.4x8.0 mm, Coronation Islands (stn 33), intertidal sand and rocks, 13.vii.1988, WAM 990-88; ♀, 10.1x12.1 mm, Lamarck Island stn 42), intertidal sand, 14.vii.1990, WAM 1028-88; 3 ♂♂, 28.5x33.0, 24.5x27.3, 24.1x27.1 mm, Condilac Island (stn 54a), intertidal sand, 16.vii.1988, WAM 948-88 (2), RMNH D 37770 (1).

Remarks.- Small juveniles of *Ocypode* can be difficult to identify with certainty but all specimens examined here displayed stidulatory tubercles and striae concordant with the pattern for *O. ceratophthalma*.

Distribution.- East Africa and Red Sea, east to Japan, southeast Asia, Hawaiian Islands, northern Australia from Shark Bay to central coastal New South Wales.

Uca capricornis Crane, 1975

Uca (*Deltuca*) *dussumieri capricornis* Crane, 1975: 36, figs. 55A, 61I.
Uca capricornis; George & Jones, 1982: 18, figs. 13, 36a-h, 55a; Davie, 1982: 205; Davie, 1985: 264; Von Hagen & Jones, 1989: 58-61, figs. 2cp, 4cp.
Uca pavo George & Jones, 1982: 25, figs. 19b, 20b, 38a-i, 55c, d; Davie, 1982: 206; Davie, 1985: 264.

Material.- 4 ♂♂, 10.6x15.8-8.2x13.0 mm, ♀, 6.8x10.3 mm, Irvine Island (stn 108), intertidal sand and coral, 25.vii.1988, RMNH D 37766; 3 ♂♂, 11.7x19.2, 11.5x19.1, 9.7x5.5 mm, ♀, 10.3x15.7 mm, Shirley Island (stn 115), intertidal, 26.vii.1988, WAM 17-89.

Remarks.- The ontogenetic colour variations of this species and the resultant confusions in its identification have been discussen by Von Hagen & Jones (1989). Large specimens from the Kimberleys agree with the "*U. pavo*" form.

Distribution.- Northwestern Australia from Exmouth Gulf to Northern Territory.

Uca dampieri Crane, 1975

Uca (*Thalassuca*) *vocans dampieri* Crane, 1975: 91, fig. 63c.

Uca dampieri; George & Jones, 1982: 67, figs. 33b, 34a, 35a, 49a-f, 58a; Davie, 1982: 205; Davie, 1985: 264; Von Hagen & Jones, 1989: 62-65, figs. 3dp, 5dp.

Material.- 6 ♂♂, 14.4x20.4-11.1x16.3 mm, Shirley Island (stn 115), intertidal, 26.vii.1988, WAM 23-89 (4), RMNH D 37764 (2).

Remarks.- The present specimens show the "strong variation" (Von Hagen & Jones, (1989) in the subdistal projection on the fixed finger of the major cheliped of males. In some animals the projection approaches the condition of *U. vomeris* McNeill, in others the projection is almost absent. In addition, the median groove on the fixed finger is only distinct proximally in these specimens and does not extend "most of length of pollex" as stated by George & Jones (1982).

Distribution.— Northwestern Australia from Exmouth Gulf to Gove, Northern Territory.

Uca mjoebergi Rathbun, 1924

Uca mjöbergi Rathbun, 1924: 9.

Uca (Celuca) lactea mjobergi; Crane, 1975: 299, ?pl. 12 figs. E-H (fide George & Jones, 1982), text-figs. 17A-C, 19O, P, 54H, HH, 69B.

Uca mjobergi; George & Jones, 1982: 80, figs. 4b, 7a, 53a-f, 58d; Davie, 1982: 205; Davie, 1985: 264.

Uca mjoebergi; Von Hagen & Jones, 1989: 66, figs. 3mb, 5mb.

Material.— Major chela of ♂, 2 ♀♀, 5.7x9.0, 5.3x8.8 mm, Heywood Islands (stn 14), mangal, 10.vii.1988, WAM 21-89.

Distribution.— Northwestern Australia from Carnarvon to Gove, Northern Territory.

Uca polita Crane, 1975

Uca (Australuca) polita Crane, 1975: 72, figs. 10A-D, 31B, 62F.

Uca polita; George & Jones, 1982: 60, figs. 28a, 29a, 47a-f, 57d; Davie, 1982: 205; Davie, 1985: 264; Von Hagen & Jones, 1989: 65-66, figs. 3pl, 5pl.

Material.— ♂, 7.0x11.0 mm, Bernouilli Island (stn 30), intertidal near mangroves, 12.vii.1988, RMNH D 37765; ♂, 7.1x?(broken), Irvine Island (stn 108), intertidal sand, 25 vii 1988, WAM 19-89.

Remarks.— George & Jones (1982) recorded the colour of the major chela as "fingers all white, outer manus rose-pink", this colour pattern also being illustrated (fig. 57d). On the Kimberley animals, the fingers were white distally with the proximal 2/3 pink, this extending onto the palm especially ventrally. There was an intense pink patch just proximal to the base of the fixed finger and the dorsal surface of the palm was orange-brown.

Distribution.— Northern Australia from Exmouth Gulf in the west to Trial Bay, New South Wales.

Additional Records

One hundred and five thalassinidean, anomuran and brachyuran species have been recorded by previous workers from the Kimberley region as defined from Broome in the southwest to the Western Australian-Northern Territory border in the northeast (table 1). Of these, 73 are species not collected during the 1988 Kimberley expedition. Three can be dismissed as almost certain misidentifications, resulting in 70 additional specific records for the region. Locality and reference are included. Species with localities given as "northwestern (or NW) Australia" have not been included, as that general citation does not necessarily include the Kimberleys. Names of species are those presently accepted in the literature. The name used in the cited reference, if different, is also included.

Table 1. Previous records of thalassinidean, anomuran and brachyuran species from the Kimberley region. Species also collected on 1988 expedition marked by *. Invalid identifications indicated by +.

Species	Locality	Reference
Infraorder THALASSINIDEA		
Axiidae		
**Axiopsis brocki* (De Man, 1887)	Broome	Poore & Griffin (1979)
**Scytoleptus serripes* Gerstaecker, 1856	Broome, Cockatoo I.	Poore & Griffin (1979)
Callianassidae		
Gourretia coolibah Poore & Griffin, 1979	Joseph Bonaparte Gulf	Poore & Griffin (1979)
Thalassinidae		
**Thalassina squamifera* De Man, 1915	Broome, Wyndham	Poore & Griffin (1979)
Upogebiidae		
Upogebia darwinii (Miers, 1884)	Cockatoo I.	Poore & Griffin (1979)
Infraorder ANOMURA		
Coenobitidae		
**Coenobita spinosus* H. Milne Edwards, 1837	Point Torment, King Sound	McCulloch (1918) (as *C. spinosa* var. *variabilis* McCulloch, 1909)
	Broome	Balss (1921) (as *C. spinosa*)
Diogenidae		
+*Clibanarius padavensis* De Man, 1890	Koolan I.	McCulloch (1918) (locality cited as "Kollan"; probably *C. taeniatus* (H. Milne Edwards, 1848), see text for this species)
Porcellanidae		
**Ancylocheles gravelei* (Sankolli, 1963)	Broome, Roebuck Bay, Pender Bay	Haig (1965) (as *Porcellana gravelei*)
Enosteoides ornatus (Stimpson, 1858)	Broome, Roebuck Bay	Haig (1965) (as *Porcellana ornata*)

Lissoporcellana furcillata (Haig, 1965)	Roebuck Bay	Haig (1965) (as *Porcellana furcillata*)
Lissoporcellana nitida (Haswell, 1882)	Broome	Haig (1965) (as *Porcellana nitida*)
**Lissoporcellana spinuligera* (Dana, 1852)	Broome, Roebuck Bay, Pender Bay	Haig (1965) (as *Pisidia spinuligera*)
Neopetrolisthes maculatus (H. Milne Edwards, 1837)	Roebuck Bay	Haig (1965) (as *P. ohshimai* (Miyake, 1937))
**Pachycheles johnsoni* Haig, 1965	Broome	Haig (1965)
Pachycheles sculptus (H. Milne Edwards, 1837)	Broome, Roebuck Bay, Pender Bay, Troughton I.	Haig (1965)
	Troughton I.	Haig (1973)
Petrolisthes boscii (Audouin, 1826)	Broome, Roebuck Bay, Pender Bay	Haig (1965)
**Petrolisthes haswelli* Miers, 1884	Broome, Cockatoo I., Yampi Sound	Haig (1965)
**Petrolisthes militaris* (Heller, 1862)	Broome, Roebuck Bay	Haig (1965)
Petrolisthes teres Melin, 1939	Broome	Haig (1965)
Pisidia dispar (Stimpson, 1858)	Broome, Roebuck Bay	Haig (1965)
	Broome	Haig (1973)
**Pisidia gordonae* (Johnson, 1970)	Broome, Roebuck Bay	Haig (1965) (as *P.* cf. *Spinulifrons* (Miers, 1884))
	Broome	Haig (1973) (as *P. gordoni*)
Polyonyx biunguiculatus (Dana, 1852)	King Sound	Haig (1965)
Polyonyx maccullochi Haig, 1965	Broome, Roebuck Bay	Haig (1965)
Polyonyx obesulus Miers, 1884	Broome, Roebuck Bay, SW of Troughton I.	Haig (1965)
	Troughton I.	Haig (1973)
Polyonyx triunguiculatus Zehntner, 1894	Broome	Haig (1965)
Porcellanella triloba White, 1852	Adele I.	Haig (1965)
Raphidopus ciliatus Stimpson, 1858	Roebuck Bay	Haig (1965)
Infraorder BRACHYURA		
Dromiidae		
Cryptodromia tumida var. *spinifera* Montgomery, 1931	Broome	Montgomery (1931)

Dorippidae		
Dorippe australiensis Miers, 1884	Yampi Sound	Tyndale-Biscoe & George (1962)
Calappidae		
* *Calappa hepatica* (Linnaeus, 1758)	Yampi Sound, King Sound	Tyndale-Biscoe & George (1962)
**Matuta granulosa* Miers, 1877	Yampi Sound, King Sound	Tyndale-Biscoe & George (1962)
Matuta lunaris (Forskål, 1775)	Yampi Sound	Tyndale-Biscoe & George (1962)
Matuta planipes Fabricius, 1798	Broome, Yampi Sound	Tyndale-Biscoe & George (1962)
Leucosiidae		
**Leucosia perlata* De Haan, 1841	Broome, Yampi Sound	Tyndale-Biscoe & George (1962)
**Leucosia reticulata* Miers, 1877	Broome, Yampi Sound	Tyndale-Biscoe & George (1962)
Leucosia thysanota George & Clark, 1976	Broome	George & Clark (1976)
Myra mammillaris Bell, 1855	Yampi Sound	Tyndale-Biscoe & George (1962)
Majidae		
Achaeus brevirostris (Haswell, 1879)	Broome, Roebuck Bay	Griffin & Yaldwyn (1965)
Achaeus lacertosus Stimpson, 1858	Roebuck Bay	Griffin & Yaldwyn (1965)
	Roebuck Bay	Griffin (1970)
Anacinetops stimpsoni Miers, 1879	Broome	Griffin & Tranter (1986)
Austrolibinia gracilipes (Miers, 1879)	SW of Adele I.	Griffin & Tranter (1986)
Huenia proteus (De Haan, 1839)	Broome	Montgomery (1931)
	Broome	Griffin & Tranter (1986)
Hyastenus campbelli Griffin & Tranter, 1986	Broome, Roebuck Bay	Griffin & Tranter (1986)
Hyastenus elatus Griffin & Tranter, 1986	Broome area	Griffin (1966: map) (as *H. diacanthus* (De Haan, 1839))
	Broome	Griffin and Tranter (1986)
**Menaethius monoceros* (Latreille, 1825)	Broome	Montgomery (1931)
Micippa excavata Lanchester, 1900	Broome	Griffin & Tranter (1986)
Micippa philyra (Herbst, 1803)	Broome	Montgomery (1931)

Paranaxia serpulifera (Guèrin, 1829)	Broome area	Griffin (1966: map)
Phalangipus australiensis Rathbun, 1918	Broome	Griffin (1973)
	Broome	Griffin & Tranter (1986)
Phalangipus filiformis Rathbun, 1916	Admiralty Gulf	Griffin (1973)
Phalangipus longipes (Linnaeus, 1758)	Broome, Adele I.	Griffin (1973)
Phalangipus trachysternus Griffin, 1973	Broome, Roebuck Bay, Admiralty Gulf	Griffin (1973)
Pseudomicippe banfieldi (McCulloch, 1913)	Broome, Roebuck Bay	Griffin & Tranter (1986)
**Schizophrys aspera* (H. Milne Edwards, 1834)	Broome area	Griffin (1966: map)
Schizophrys dama (Herbst, 1804)	Broome	Montgomery (1931)
Thacanophrys albanyensis (Ward, 1933)	Broome	Griffin & Tranter (1986)
Thusaenys irami (Laurie, 1906)	Broome	Griffin & Tranter (1986)
Tiarinia angusta Dana, 1852	Broome, Cape Leveque	Griffin & Tranter (1986)
Tiarinia garthi Griffin & Tranter, 1986	Broome	Griffin & Tranter (1986)
Portunidae		
Charybdis callianassa (Herbst, 1789)	Roebuck Bay	Stephenson, Hudson & Campbell (1957)
	N of Broome	Stephenson (1961)
	Roebuck Bay	Stephenson (1972b)
Charybdis jaubertensis Rathbun, 1924	Broome, Roebuck Bay	Stephenson, Hudson & Campbell (1957)
Charybdis natator (Herbst, 1789)	Roebuck Bay	Stephenson, Hudson & Campbell (1957)
	Roebuck Bay	Stephenson (1972b)
Lissocarcinus polybiodes Adams & White, 1849	Roebuck Bay	Stephenson (1972b)
**Portunus hastatoides* Fabricius, 1798	Roebuck Bay	Stephenson & Campbell (1959)
	Roebuck Bay	Stephenson (1972b)
**Portunus pelagicus* (Linnaeus, 1766)	Broome	Rathbun (1924)
	Roebuck Bay	Stephenson & Campbell (1959)
Portunus rubromarginatus (Lanchester, 1900)	Cygnet Bay	Stephenson & Campbell (1959)
	Cygnet Bay	Stephenson (1972b)

**Portunus tenuipes* (De Haan, 1835)	Cygnet Bay	Stephenson & Campbell (1959)
	Cygnet Bay	Stephenson (1972b)
**Scylla serrata* (Forskål, 1775)	Broome	Stephenson (1972b)
**Thalamita admete* (Herbst, 1803)	Broome, Cape Leveque	Stephenson & Hudson (1957)
	Broome, Cape Leveque	Stephenson (1972b)
Thalamita annulipes Stephenson & Hudson, 1957	Broome	Stephenson & Hudson (1957)
	Broome	Stephenson (1972b)
Thalamita bouvieri Nobili, 1906	Yampi Sound	Stephenson (1961) (as *T. inhacae* Barnard, 1950)
**Thalamita crenata* H. Milne Edwards, 1834	Broome	Rathbun (1924)
**Thalamita danae* Stimpson, 1858	Broome	Stephenson & Hudson (1957) as *T. stimpsoni* A. Milne Edwards, 1861)
	Broome	Stephenson (1972b)
**Thalamita intermedia* Miers, 1886	Broome, Roebuck Bay	Stephenson & Hudson (1957)
	Broome	Stephenson (1972b)
Thalamita sima H. Milne Edwards, 1834	Broome, Roebuck Bay	Stephenson & Hudson (1957)
Xanthidae		
Actaea savignyi (H. Milne Edwards, 1834)	Broome	Montgomery (1931)
Menippidae		
**Epixanthus dentatus*(White, 1847)	Broome	Rathbun (1924)
Myomenippe fornasinii (Bianconi, 1851)	Point Torment, King Sound	McCulloch (1918) (as *M. leguilloui* (A. Milne Edwards, 1867))
	Broome	Rathbun (1924)
Pilumnidae		
Actumnus obesus Dana, 1852	Broome	Montgomery (1931)
	Broome	Takeda & Miyake (1969)
Pilumnopeus sexangulus (Rathbun, 1909)	Broome	Rathbun (1924) (as *Heteropanope sexangula* Rathbun, 1909)
Pilumnus maccullochi Montgomery, 1931	Broome	Montgomery (1931)
**Pilumnus pulcher* Miers, 1884	Broome	Montgomery (1931)
	Holothuria Bank	Balss (1933)
	Broome, Holothuria Bank	Takeda & Miyake (1968)

Pilumnus semilanatus Miers, 1884	Broome	Montgomery (1931)
	Holothuria Bank	Balss (1933)
	Broome, Holothuria Bank	Takeda & Miyake (1968)
Pilumnus spinicarpus Grant & McCulloch, 1906	Broome	Montgomery (1931)
Grapsidae		
+Metopograpsus messor (Forskal, 1775)	Koolan I., King Sound	McCulloch (1918) (locality spelt "Kollan")
	Broome	Rathbun (1924) (both references probably to *M. frontalis* Miers, 1880, see text for this species)
Pinnotheridae		
Pinnotheres cardii Bürger, 1895	Broome	Rathbun (1924)
Ocypodidae		
Macrophthalmus convexus Stimpson, 1858	Roebuck Bay	Barnes (1967)
**Macrophthalmus crassipes* H. Milne Edwards, 1853	Broome	Rathbun (1924)
	Roebuck Bay	Barnes (1967)
Macrophthalmus latreillei (Desmarest, 1822)	Broome	Rathbun (1924)
	Broome	Barnes (1967)
Macrophthalmus pacificus Dana, 1851	Broome	Rathbun (1924)
	Roebuck Bay	Barnes (1968)
Macrophthalmus telescopicus (Owen, 1839)	Yampi Sound	Barnes (1967) (possibly *M. milloti*: see Serène (1973))
**Ocypode ceratophthalma* (Pallas, 1772)	Koolan I.	McCulloch (1918), (locality spelt "Kollan")
	East Montalivet I.	George & Knott (1965)
Ocypode cordimana Desmarest, 1825	East Montalivet I.	George & Knott (1965)
Ocypode fabricii H. Milne Edwards, 1837	Broome, Derby, East Montalivet I., Yampi Sound	George & Knott (1965)
Uca australiae Crane, 1975	Broome	Crane, 1975 (as *U.* (*Deltuca*) *demani australiae*)
	Broome	George & Jones, 1982
**Uca capricornis* Crane, 1975	Broome, Derby, Port Warrender	George & Jones, 1982 (incl. *U. pavo* George & Jones, 1982)
**Uca dampieri* Crane, 1975	Broome	Crane (1975) (as *U.* (*Thalassuca*) *vocans dampieri*)
	Broome, Derby	George & Jones (1982)
+Uca dussumieri (H. Milne Edwards, 1852)	Broome	Rathbun (1924) (comprising *U. flammula, U. australiae, U. capricornis:* see George & Jones (1982))

Uca elegans George & Jones, 1982	Broome, Derby, Kimbolton, Port Warrender	George & Jones (1982)
Uca flammula Crane, 1975	Broome	Crane (1975) (as *U. (Deltuca) coarctata flammula*)
	Broome, Derby, Koolan I., Port Warrender, Wyndham	George & Jones (1982)
Uca hirsutimanus George & Jones, 1982	Broome, Derby, Wyndham	George & Jones (1982)
**Uca mjoebergi* Rathbun, 1924	Broome	Rathbun (1924) (as *U. mjöbergi*)
	Broome	Crane (1975) (as *U. (Celuca) lactea mjøbergi*)
	Broome	George & Jones (1982) (as *U. mjobergi*)
**Uca polita* Crane, 1975	Broome	Crane (1975) (as *U. (Australuca) polita*)
	Broome, Derby	George & Jones (1982)
Uca seismella Crane, 1975	Broome, Derby, Port Warrender, Wyndham	George & Jones (1982)
Uca signata (Hess, 1865)	Derby, Kimbolton, Port Warrender, Wyndham	George & Jones (1982)

Biogeography

Of the 101 species which could be identified with some certainty from the 1988 expedition, 58 (57%) are widely distributed in the Indo-West Pacific and 25 (25%) are distributed through southeast Asia from as far north as Japan and east of the eastern coast of India to Australia and the islands immediately to the north. Eighteen (18%) species are known only from Australia, especially its northern shores, but it is likely that several of these species will be recorded from outside of Australia in future.

With the inclusion of the additional 70 species recorded in the literature, the 84 Indo-West Pacific species account for 49%, the 49 southeast Asian species for 29% and the 38 Australian endemics for 22% of known species from the Kimberleys. The slight decrease in the proportion of Indo-West Pacific species and corresponding increases in the other categories is due in part to the different biases of the 1988 collection and that of earlier workers. Very few species of hermit crabs and xanthid crabs had been recorded prior to this report and both of these large taxa comprise many species with very extensive distributions in the Indo-West Pacific. Conversely, majid crabs were poorly represented in the 1988 collection but earlier records show a high proportion of species with southeast Asian distributions.

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