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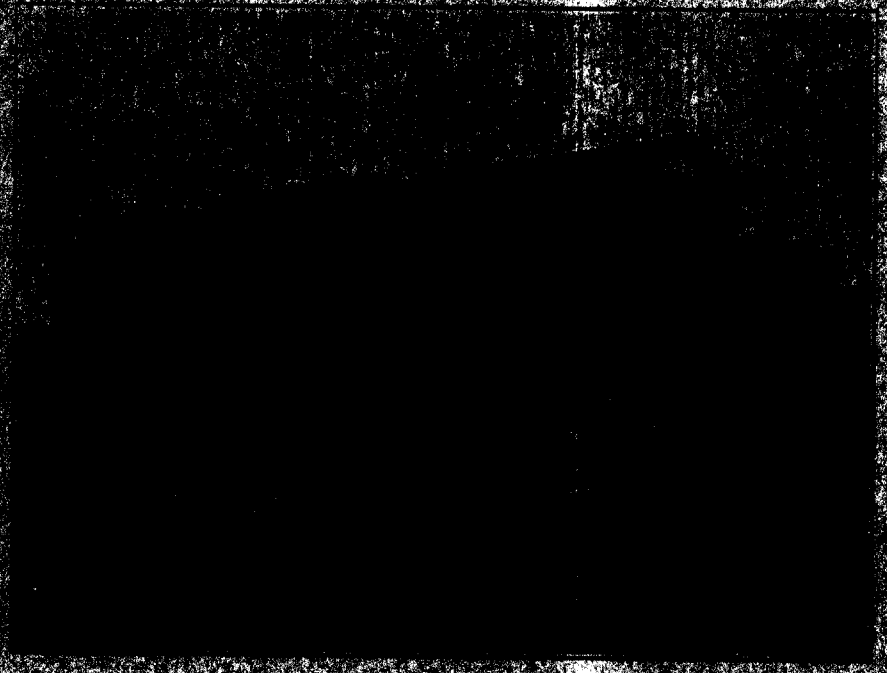

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SYDNEY, JUNE 7, 1930.

STUDIES IN AUSTRALIAN CARCINOLOGY.

No. 3.

By

Frank A. McNeill, Zoologist, Australian Museum.

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(Plates xxxv-xxxvii, and Figures 1-4.)

This paper deals with several local species considered to have been previously insufficiently described or incorrectly assigned generically. The description of a new species of *Spoocarcinus*, the first to be recognized from Australia, is also submitted, as well as some important records of other species.

Family PALÆMONIDÆ.

Genus Palæmon *Fabricius*.

Subgenus Parapalæmon.

Palæmon (Parapalæmon) australis (*Ortmann*).

(Plate xxxv.)

Palæmon sp. ? (*P. australis*), Ortmann, Zool. Jahrb., Syst. v, 1890, p. 708.

Palæmon australis McNeill, *in* The Australian Encyclopædia, ii, Sydney, 1926, p. 325, and fig. *Id.*, Hale, Trans. Roy. Soc. South Australia., li, 1927, p. 309; and Handbook Flora and Fauna S. Australia, British Science Guild (S. Austr. Branch) —Crust. S. Austr., Pt. i, 1927, p. 60, fig. 56.

Description.—Carapace and abdominal region smooth. A "J"-shaped depression behind the eye. Cervical groove distinct laterally. Distinct antennal and hepatic spines present.

Rostrum lanceolate, deep in lateral view, and straight or with the tip inclined slightly upwards; it reaches beyond the antennular peduncle, but rarely to the end of the antennal blade. Dorsally it bears 8-10 small teeth, usually 9; two or three of these are situated on the carapace just behind the posterior limit of the orbit, and are usually more widely spaced than the others. Three to five teeth occur on the lower margin of the rostrum, usually four. The lateral ridge extends along the middle of the rostrum, so that the structure is as broad below as above.

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* For No. II. see Rec. Austr. Mus., xv, 1, 1926, p. 100.

Telson terminating in a fixed acute spine, immediately to the sides of which are two pairs of movable spines, the inner pair being large and distinct. Two more pairs of small movable spines are situated on the lower half of the telson above, and near its articulation with the sixth abdominal somite is a distinct bunch of long setæ. The distal extremity is also adorned with a bunch of setæ originating below the terminal spines.

A small but prominent spine is present on the joint at the base of the antennal spine. The antennal blade extends for nearly one-third of its length beyond the distal joint of the antennular peduncle. The third, or external, maxillipeds, when straightened, reach about as far forward as the distal extremities of the antennular peduncles.

When the first pair of legs is fully extended forward, the carpal joints extend well beyond the antennal blade, often to the extent of over one-third, but less than one-half of their length. These chelate limbs are noticeably more slender than the last three ambulatory pairs. The second pair of chelate limbs is very massive and heavy, and covered with minute spinules; one limb is always larger than the other, and the ischium of the larger is more than half the length of the merus, which is approximately equal to that of the carpus. The palm is longer than the carpus, but its length varies somewhat with age and individually; in the smaller companion limb the palm is about the same length as the carpus, and sometimes slightly shorter. The fingers of the two large hands may be about as long as their respective palms, but are often considerably shorter, particularly in the largest specimens; they are covered with a thick growth of hair, and each has two prominent more or less triangular teeth on the proximal half, those of the immovable finger being the largest. In aged examples the distal half of the fingers is minutely dentate. The ischium of the large chelate limbs is strongly compressed laterally, and there is a longitudinal groove on its inner surface. The meral and carpal joints are cylindrical and thicker distally. The palm is again compressed, with its angles rounded.

The two anterior pairs of ambulatory limbs are of equal length; the third pair is slightly longer. All the joints are clothed with fine setæ, and the propodi are armed below with a row of minute and elongate movable spines. The tips of the propodi of the last pair of limbs each bear a distinct brush of fine setæ below.

The above description applies to a series of 18 adult males in which the length of the carapace, from the tip of the rostrum to the posterior margin, measures 21·5 to 33 mm.

Twenty-three adult females, of which 15 are bearing eggs, have the chelipeds of the same proportions as the males, but they are comparatively much smaller in size. One specimen has only seven

teeth on the rostrum above. The eggs are large and few in number; their average length is 1 mm., and just before incubation they may measure 1½ mm.

Juvenile specimens differ principally in the proportions of the second or larger chelate limbs, which are commonly equal in size, and smooth. The fingers are longer, sometimes being much longer than the palm, and are devoid of teeth. The rostrum, too, commonly reaches to the end of the antennal blade.

So far as can be ascertained, no detailed description of this species has been published, and certainly none has appeared in any Australian journal. Published figures have also been inadequate. It is therefore hoped that the description of the present unique series of specimens in the Australian Museum will serve to put the future study of the species on a sound basis.

Locality.—Horton River at Pallal, near the town of Bingara, New South Wales.—A large series collected by the late Allan R. McCulloch.

Variation within the species.—It appears that *Palæmon* (*P.*) *australis* has a most extensive range in the freshwater river systems of the eastern and southern portions of Australia, and that many perplexing racial forms exist similar to those exhibited by the Australian freshwater Atyidean shrimp *Paratya* (*P.*) *australiensis* (Kemp).[1] Possibly varieties of the species also occur. Unfortunately, however, our present material is meagre, and it is practically useless to base descriptions on anything but complete series of specimens from individual localities as in the present instance. The figure of the southern Australian form provided by Hale (*tom. cit.*) has the general facies of the form described above, but the hands are not clothed as in the series from Pallal, and there is no sign of the well developed teeth on the cutting edges of the fingers. Obviously this form of the species belongs to a distinct race, or is even a variety of the species.

Discussion and Status.—In 1890 (*tom. cit.*) Ortmann included under "Palæmon sp.?" several southern Queensland specimens from freshwater at Gayndah, Rockhampton, and Peak Downs. He further referred them to the subgenus *Eupalæmon*, suggested they might be the young of the *Palæmon* n. sp. of de Man (1887),[2] and at the end of a comparative description proposed the name "*P. australis* n. sp." in the event of certain characters proving to be constant.

As early as 1910 my predecessor, the late Allan R. McCulloch, submitted several specimens from the above described series to Dr. J. G. de Man. This eminent authority's letter of reply, dated 21st

[1] *Cf.* Roux, Records Austr. Mus., xv, 3, 1926, p. 239.
[2] de Man.—Zool. Jahrb., Syst. ii, 1887, p. 711, f. 4.

March, 1910, contains the following interesting and instructive remarks:—

In my opinion this species belongs to that which has been described by Dr. Ortmann, and for which he has created the name of *P. australis*. . . . I have taken the trouble to look over all the Indo-Pacific species of *Palæmon*; in my opinion your species is different from all, except *P. australis*, that has not yet been figured. It is a quite interesting species, related to *Pal. javanicus*, Heller, and that apparently ought to be referred to the subgenus *Parapalæmon*; Ortmann's specimens, that were young, did not yet distinctly show the characters of this subgenus and therefore were still referred by him to the subg. *Eupalæmon*.

Upon my demand Prof. Ehlers of Göttingen was so kind to send me the specimen from Sydney, described by me [see footnote [2]] to compare it with your specimens. This specimen now appears to me to *differ* from your specimens of *Pal. australis* collected near Bingara, N. S. Wales. The rostrum figured by me may be abnormal, though it cannot be proved with certainty before more specimens belonging to the same species will have been discovered: the habitat "Sydney" may also be false, but, of course, this is only a supposition.[3] This specimen differs, however, from your specimens by the *more slender shape of the thoracic legs, as also of the caudal fan.* The carapace is 22 mm. long from the orbital margin (exclusive therefore of the rostrum) until to the posterior margin. That of the largest of your specimens, also a male, is 23½ mm. In the "Sydney" specimen the telson is 12 mm. long, and 3¾ mm. wide at base; in your male, long 23½ mm., the telson is 10½ mm. long and 4 mm. wide at base, presenting a less slender form. The endopodite of the caudal fan in the "Sydney" male is 12 mm. long and 4·3 mm. broad: appears in your male 11 mm. long and 4·75 mm. broad. In the "Sydney" male the merus and the carpus of the larger 2nd leg are 24 mm. resp. 27½ mm. long, the merus 4 mm. thick near distal extremity, the carpus 4·2 mm. In the larger leg of your male the merus and the carpus are each 20 mm. long,* the merus 4·75 mm. thick at apex, the carpus as much. These numbers prove the *more slender* form in the "Sydney" specimen.

The meropodite and propodite of the 3rd legs are in the "Sydney" male 13½ mm. resp. 12 mm. long, the meropodite 1·5 mm. thick, and the propodite 0·8 mm. broad in the middle. In your male from Bingara the meropodite of the 3rd legs is 10½ mm. long and 1·45 mm. thick, the propodite 9½ mm. and 0·85 mm. broad: as in the first legs, these numbers also show the stouter shape of the legs in your specimens. In your letter you called attention to the considerable amount of variation shown by your specimens. You ought now to examine whether they show also so great a variation as regards the proportion between the length and thickness or width of the joints of the thoracic legs as the difference in these proportions existing between your male from Bingara and the "Sydney" male from the Göttingen Museum. The *more slender* form of the thoracic legs† and of the caudal fan in the "Sydney" male is so striking that I am inclined to regard it as a species different from *P. australis*, and I can hardly believe that the variability of the latter should be so great that the "Sydney" species might be regarded as a variety of *australis*.

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[3] There is every reason for the doubt expressed by de Man. The writer has had some experience collecting in the freshwater streams in and around Sydney and has never discovered any examples of *Palæmon*. In fact, it is justifiable to believe that they do not occur anywhere near Sydney. There are certainly no specimens of *Palæmon* from the vicinity of Sydney in the collection of the Australian Museum.

* "In *P. australis* the merus is as long as the carpus; in the 'Sydney' male shorter than the carpus."

† The thoracic legs are comparatively also longer in the Göttingen male, the body being slightly shorter; the carapace 22 mm. long, in your male 23·5 mm.

Family ATYIDÆ.

Atya *Leach.*

Atya striolata *McCulloch and McNeill.*

Atya striolata McCulloch and McNeill, Rec. Austr. Mus., xiv, 1, 1923, p. 55, pl. ix, figs. 3-4; and pl. x, fig. 3 (*Type locality.*—Nepean R., N. S. Wales). *Id.*, Roux, *loc. cit.*, xv, 3, 1926, p. 253.

A batch of ten specimens of this species has been acquired by the Australian Museum, establishing an additional and interesting locality for the species in the freshwaters of New South Wales. The specimens measure from 24 to 41 mm. in length (tip of rostrum to end of telson). Two of the three largest examples are egg-bearing females.

The species has previously been recognised from only one locality additional to that of the types; this was in a different watershed, but not greatly removed from the type locality. The present record suggests a very much wider distribution of the species, which was originally thought to be of rare occurrence.

Great interest must naturally be attached to any new data concerning the genus *Atya* in Australia, as the species in question forms the only authentic record from this large southern continent.

Species previously recorded from New South Wales.—Norton's Basin, Nepean River (Type Locality). Upper reaches of Woronora River (freshwater), flowing into George's River, near Sydney.

Additional locality.—In Myall River, near Gloucester, north from Newcastle, New South Wales, Dec., 1926. Collected by Miss L. M. Woods, B.A., School of Zoology, University of Sydney.

Panulirus (Gray-MS.) White.

Panulirus japonicus *(von Siebold).*

Palinurus japonicus von Siebold, Spicilegia Faunæ Japonicæ, 1824, p. 15. *Id.*, de Haan, *in* Siebold's Fauna Japonica, Crust. 5, 1841, p. 158, pls. xli and xlii.

Panulirus japonicus Rathbun, Bull. U.S. Fish. Comm. xxiii, 3, 1903 (1906), p. 897, pl. v (with synonymy). *Id.*, Balss, Abhandl. d. math.-phys. Klasse d. k. bayer. Akad. d. Wissensch., Suppl. Bd. II, Abhand. 10, 1914, p. 77. *Id.*, de Man, "Siboga" Expd., Monogr. xxxix*a*^{2}, Decapoda pt. iii, 1916, p. 44. *Id.*, Parisi, Atti della Soc. Ital. d. Sci. Nat. lvi, 1917, p. 8.

A recent acquisition at the Australian Museum is a fine adult female example of the above species, which agrees perfectly with de Haan's figure, even to the longitudinal white lines on the ambu-

latory limbs; this latter feature is apparently not fully developed in Rathbun's smaller and light coloured example from the Hawaiian Islands (*fide* fig., 1906).

The species is evidently subject to considerable colour variation, being lighter or darker in individuals from the same locality, but the general colour scheme appears to be the same.

The present specimen measures 371 mm. (approx. 15 inches) from the tips of the rostral spines to the end of the telson. It is a dark variety of the species, and is medium-toned to dark purple-red in places on the carapace and dorsum of the abdomen, merging into an almost black hue on the legs, pleura of the abdominal somites, and the bases of many of the larger spines on the carapace. The characteristic flecks of white are scattered over the carapace, bases of the antennæ and antennules, and pleura of the abdominal somites.

Panulirus japonicus is known from many Indo-Pacific localities between Mauritius and the Hawaiian Islands, but the present record is the first from Australian waters.

Locality.—Three miles east of Evans Head, on coast near Ballina, Richmond River, northern New South Wales; secured by fishermen in a "lobster" pot. The specimen was received in a fresh condition from the State Fisheries Branch, Chief Secretary's Department, New South Wales, in December, 1926.

Family PORTUNIDÆ.

Genus CHARYBDIS *de Haan*.

CHARYBDIS CRUCIATA (*Herbst*).

(Plate xxxvii, fig. 5.)

Cancer cruciatus Herbst., Naturg. d. Krabben u. Krebse, ii, Heft 5, 1794, p. 155, pl. xxxviii, fig. 2.

Portunus crucifer Fabricius, Ent. Syst. Suppl., 1798, p. 364.

Charybdis crucifera Tozzetti, Bull. Soc. Entom. Italiana, iv, Firenze, 1872, p. 392.

Goniosoma crucifera Whitelegge, Journ. Roy. Soc. N. S. Wales, 1889, p. 228 (record only). *Id.*, Ogilby, Edible Fish and Crust. N. S. Wales, 1893, p. 204.

Goniosoma cruciferum Ortmann, Zool. Jahrb., Syst., vii, 1893, p. 81.

Charybdis (*Goniosoma*) *crucifera* Alcock, Journ. Asiat. Soc. Bengal (n. ser.), lxviii, pt. 2, No. 1, 1899, pp. 49 and 51 (references).

Charybdis cruciatus Stead, Zoologist (4), ii, 1898, p. 204. *Id.*, Stebbing, Crust. South Africa, ii, 1902, p. 9 (synonymy and references).

Charybdis cruciata Rathbun, Bull. U. S. Fish. Comm., xxiii, 3, 1903 (1906), p. 872. *Ibid.*, in Stimpson, Smithson. Miscell. Colls., xlix, No. 1717, 1907, p. 80 (references).

Charybdis (*Goniosoma*) *cruciata* Delsman and de Man, Treubia, vi, livr. 3-4, 1925, pp. 308, 311, 316, pl. xii, *b*.

Charybdis crucifera Balss, Archiv für Naturg., 88 Jahrg., Abt. A, 11 Heft, 1922, p. 104.

An effort is here made to assemble in chronological order an account of the various references in literature to *C. cruciata*. With the exception of original references, repetition has been avoided, as several of the authors quoted have provided data which possibly cover the balance of literature on the species.

Early figures of *C. cruciata* are more or less crude, and most later illustrations depict only portions of the animal. The opportunity is therefore taken of submitting in this paper an excellent complete figure drawn by my colleague Mr. J. R. Kinghorn, which is the first to appear in Australian literature on the group. The original is a young female example from Kogarah Bay, in Botany Bay near the mouth of George's River, N. S. Wales; collected W. Davison, 1918 (carapace 43 mm. wide between the tips of the postero-lateral spines). Two large male and female specimens in the Australian Museum collection, from Port Jackson, N. S. Wales, measure respectively 139·5 mm. and 138 mm. between the tips of the postero-lateral spines.

Distribution.—The species occurs over a wide range in the Indian and eastern Pacific Oceans and the China Sea, and is usually an inhabitant of the shallow waters of bays and river estuaries. One or more examples are occasionally collected along the eastern coast of Australia.

In the writer's experience *C. cruciata* is rather uncommon in Port Jackson and the vicinity, and only very occasional specimens reach the Australian Museum. Ogilby noted in 1893 (*loc. cit.*) that the species "sometimes occurs in the markets in considerable numbers," but apparently the local numerical strength has diminished since then.

Family GONEPLACIDÆ.

Genus CARCINOPLAX *H. M. Edw.*

CARCINOPLAX MERIDIONALIS *Rathbun.*

Carcinoplax meridionalis Rathbun, Biol. Res. F.I.S. "Endeavour," v, 3, 1923, p. 99, pl. xviii (*Type locality.*—Off Rame Hd., Victoria, 76 faths.).

Pilumnoplax abyssicola Whitelegge, Mem. Austr. Mem., iv, 2, 1900, p. 158 (*nec* Miers, 1886).

A careful comparison of the holotype of this species with the specimens in the Australian Museum identified by Whitelegge from off Botany Bay, New South Wales, in 50-52 fathoms as *P. abyssicola* proves beyond doubt that they are referable to one and the same species. *P. abyssicola* must, therefore, be erased from the Australian faunal list, and *C. meridionalis* recorded for the first time from New South Wales waters.

Whitelegge's six specimens are all juvenile, measuring only 5 to 7·5 mm. between the tips of the lateral spines, thus being considerably smaller than Rathbun's holotype of *C. meridionalis* (width between tips of lateral spines 30·2 mm.). This probably partially accounts for the fact that the specimens were not recognized as representing a new species.

Since *C. meridionalis* was described a considerable number of specimens has come to hand from off the coast of New South Wales through the activities of the recently established trawling industry. Nearly all of these considerably extend the range of *C. meridionalis* northward along the eastern Australian coastline, and the localities are additional to those supplied by Rathbun in 1923. Apart then from Whitelegge's earlier record, there are specimens (mainly collected by members of the staff) in the Australian Museum from—

3 to 4 miles off Eden, 25 to 30 faths.; 5 specimens.
12 to 22 miles N. ½ E. from Green Cape, 39 to 46 faths.; 18 specimens.
About E. of Ulladulla (lat. 35° 20′ S., long. 150° 47′ E.), 74 faths.; 1 specimen.
E. of Ulladulla, 65 to 70 faths.; 1925; 1 specimen.
10 to 20 miles S. of Montague Id., 30 to 40 faths.; 1 specimen.
24 miles N.N.E. of Montague Id., 80 to 90 faths.; 1 specimen.
Off Botany Bay, 33 to 56 faths.; 3 specimens.
About 16 to 18 miles N.E. of entrance to Port Jackson, 15 miles from coast (approx. lat. 33° 44′ S., long. 151° 38′ E.), 75 to 80 faths.; 1 specimen.

Genus Speocarcinus *Stimpson.*

Stimpson, Ann. Lyc. Nat. Hist. New York, vii, 1859, p. 58 (type.—*S. carolinensis* Stimp.); Rathbun, Bull. U.S. Nat. Mus., 97, 1917, p. 38.

The species described below agrees very well with the diagnosis of *Speocarcinus* given by Rathbun (*tom. cit.*), and it has not been thought necessary to erect a new genus for the accommodation of this newly recognised Australian form. The few minor points of

difference between the characters of the unique Australian representative of the genus and Rathbun's generic diagnosis are as follows:—

The fronto-orbital width is less than "three-fifths" of the "entire width" of the carapace, but is more than half.

Antero-lateral margins only very obscurely indented, with teeth obsolete, and not "dentate," with "teeth small."

Maxillipeds are "gaping," but only slightly so between the borders of the ischial joints when closed.

Meral joints of the maxillipeds not "as long as broad," but slightly broader than long; their antero-lateral angles, however, are prominent.

"Third to fifth segments" of the male abdomen appear not to be "more or less fused."

Up to the present time the members of the genus *Speocarcinus* have been recorded only from the Atlantic and Pacific coasts of the American continent, and four species have been described from this area (*fide* Rathbun, *tom. cit.*).

My thanks are due to Dr. Mary Rathbun for drawing attention to the fact that the Australian form was new to science, and to Mr. G. P. Whitley of the Australian Museum for the excellent line drawings which appear in the text.

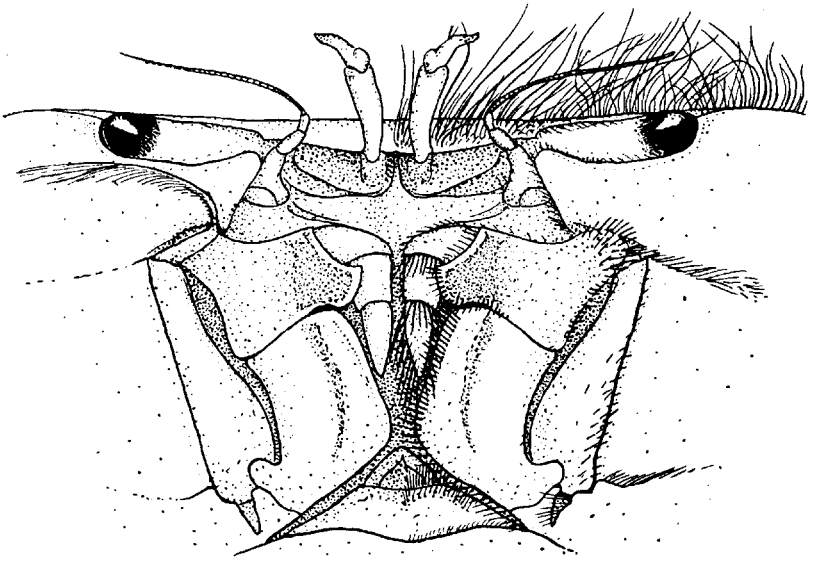
Two photographs prepared at Dr. Rathbun's instigation, when she had two examples of the new species on loan, are published in the present paper.

SPEOCARCINUS LUTEUS *sp. nov.*[4]

(Plate xxxvi and Figures 1-4.)

Description.—Carapace nearly smooth, sparsely pitted and obscurely granular or ridged near the margins. A broad shallow groove on each side of the cardiac region is distinct, but the other inter-regional grooves are indefinite. Margins of carapace and limbs with fringes of hairs; scattered but often well defined hairs may also occur over the carapace. Length 15 mm.; breadth 21 mm.; fronto-orbital width 11·3 mm. Antero-lateral borders thin, cristate, and entire except for two almost obsolete and ill-defined indentations. They are confluent with the postero-lateral borders, which are parallel, or nearly so. Front deflexed, the edge sinuous, and with a shallow median notch. It is less than one-fourth the width of the carapace, and the rather indefinite lobes are confluent with

[4] In allusion to the mud-living habits of the species.



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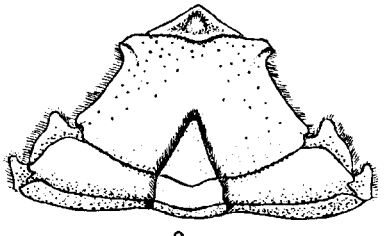

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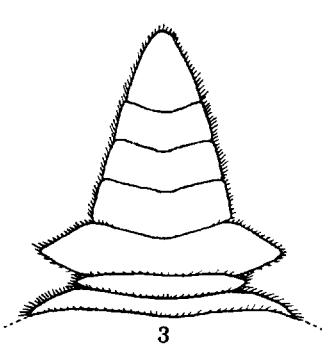

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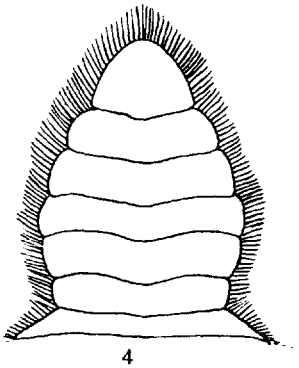

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Figures 1-4. *Speocarcinus luteus*, n. sp.
Fig. 1. Holotype; frontal view, half denuded. Fig. 2. Holotype; ventral portions of sternum and abdomen. Fig. 3. Abdomen of male, holotype. Fig. 4. Abdomen of female, paratype.

the outer angles, which again are not distinct from the inner orbital angles.

Eyes partly visible from a strict dorsal view, cone-shaped and thick; cornea small. Upper orbital margin smooth to the naked eye, a minute granulation being visible only with the aid of a powerful binocular microscope; no fissures present, and the outer angle not produced. Inferior orbital margin somewhat similar to the upper, again without fissures, and with the inner angle next the hiatus rounded and a little produced.

Outer maxillipeds slightly gaping between their inner ischial borders when closed, and with their component joints conspicuously furrowed externally. Greatest length of the merus about as long as ischium. Merus not quite as long as broad, its antero-external angle produced and rounded. Sternum broad, its greatest width not quite equal to the breadth of the carapace.

Chelipeds subequal; meral joints angular; margins granular, the upper one produced into a well defined tooth on its distal half. Wrists smooth externally, granular only near the distal edges, with the inner angle produced and sub-acute. Hand almost smooth, except for some granules above and at the lower basal angle. Movable finger granular above near the base. Immovable finger bent slightly downwards below the lower border of the palm. Both fingers with several large irregularly shaped and spaced teeth; they gape at their bases, but meet along the rest of their length, and the tips are recurved and overlap when closed.[5] Immovable finger nearly as long as the upper border of the palm.

Ambulatory legs unarmed, smooth and dorso-ventrally depressed; the third pair is the longest. The dactyli of the first three pairs of legs are long, slender and styliform; those of the last pair of legs shorter and curved upwards.

Colour.—Live specimens and those freshly preserved in alcohol are of a general rusty colour, with portions of the carapace and outer surfaces of the chelipeds lighter, and tending towards a creamish shade.

Description and figures based on an adult male example, which has been selected as the holotype of the species. It was dredged from a muddy bottom in six fathoms, Salamander Bay, Port Stephens, New South Wales, by the late Allan R. McCulloch on 24th Sept., 1919. The holotype, together with three paratypes (one female 11 mm. wide and two males 16 and 20 mm. wide) collected at the same time, is stored in the collection of the Australian Museum (Regd. No. P.4489).

[5] The male holotype is more or less senile, and unfortunately the tips of two of the fingers are mutilated.

Sexual Dimorphism.—Adult females differ from the male holotype in having the chelipeds and limbs more hirsute. The chelipeds are less massive, and are practically equal in size. On the lower border of each palm there is a strong raised granular ridge, with traces of some rows of granules above on the proximal half. The grooves on the outer surfaces of the fingers are conspicuous and deep. Large regular teeth occur on the cutting edges of the fingers, those of the immovable fingers being clearly the largest, and the opposing sets meet neatly when the fingers are closed.

One juvenile male before me (carapace 11 mm. wide) has hands which agree in character with those of adult females, except that there is no trace of granules on the proximal half of the outer palm.

Additional material.—Besides the type series, there are other New South Wales examples in the Australian Museum from—

Port Stephens, dredged Jan., 1920; one female.
Off Sandy Point, Broken Bay, dredged 1-2 fathoms, mud ooze; Jan., 1926; one male.
Port Jackson; Old Collection; two females.

Genus Mertonia *Laurie.*

Report Govt. Ceylon, Pearl Oyster Fisheries of Gulf of Manaar, part v, 1906, Brachyura, p. 423 (*type.—M. lanka* Laurie); and Tesch. Rés. "Siboga" Exped., Monogr. xxxix c[1], Brachyura II, p. 217.

The genus *Mertonia* is here recognised for the first time from Australian waters, being proposed as the proper generic name for Haswell's species *"Pilumnus integer."* A careful examination of Haswell's unique type proves that the species agrees well with the diagnosis given by Laurie and later supplemented by Tesch. It is the second known member of the genus, and there is no reason to doubt that it is now correctly placed, despite the fact that the characteristic flagella of the antennæ have become detached and are missing from Haswell's dried type specimen in the Australian Museum.

Mertonia integra (*Haswell*).

(Plate xxxvii, figs. 1-4.)

Pilumnus integer Haswell, Proc. Linn. Soc. N. S. Wales, vi, 1881, p. 545; and Cat. Austr. Crust., 1882, p. 325. *Id.*, Whitelegge, Journ. Roy. Soc. N. S. Wales, 1889, p. 227. *Id.*, Miers, "Challenger" Zool., xvii, 1886, Brachyura, p. 149.

Chasmocarcinus? integer Rathbun, Biol. Res. F.I.S. "Endeavour," v, 3, 1923, p. 111.

Description.—Margins of carapace and limbs fringed with fine hairs; these are longest on the limbs and sparse on the carapace. Dorsal surface of carapace bare except for a patch of close, short, matted hairs near the anterior borders. When denuded the whole surface of the carapace is finely granular and minutely wrinkled. From a direct dorsal view the outline is roughly semicircular.[6] It is strongly convex longitudinally, being very much more deflexed in front than behind; from side to side the carapace is flat. It is widest posteriorly, with the border strongly curved, and a distinct groove traverses the length of the border just inside the margin, giving it a raised appearance. Postero-lateral borders confluent with the antero-lateral, and entire, both converging rapidly towards the narrow front. A groove extends back from the well-marked frontal notch, and a distinct one is present on each side of the cardiac region. Other regional grooves more or less indefinite. First two segments of the abdomen and sternum visible from a dorsal view. Length of carapace 6·5 mm.; breadth between posterior borders 8·5 mm.; fronto-orbital width 4·5 mm.; widest part of sternum 8 mm. Front strongly deflexed, its edge produced into two distinct rounded lobes, which are confluent with the outer angles; the latter are not distinct from the inner orbital angles.

Eyes barely visible from a direct dorsal view, small, thick; they have angular frontal edges; the dorsal surfaces are flat, microscopically granular, and on the same plane as the carapace. Orbital borders entire, the upper ones sparsely clothed with microscopic granules, and with their external angles not produced; lower orbital borders smooth, with their inner angles rounded and receding.

Outer maxillipeds gaping, oblique. Merus a little broader than long, shorter than the ischium, and with its antero-lateral angle produced. Ischium with a median furrow externally. Distal halves of the basal joints of the antennæ situated in the orbital hiatuses, but the characteristic flagella have been lost through damage.

Chelipeds apparently moderately unequal. Wrist nearly smooth, obscurely granular near the anterior margins, and with its inner angle produced. Larger hand granular above on and near the border and around the base. There is also a raised granular ridge along the lower margin, which traverses the length of the movable finger. Inside of this is a groove which becomes more defined distally, and is deepest just beyond the base of the movable finger. Remainder of the outer surface of the hand smooth. Movable finger of the large hand with a few granules near the base, its length being about equal to that of the palm. The fingers do not quite meet along their length when closed, but the tips overlap.

[6] In the figure appearing in this paper the anterior portion of the carapace is illustrated as being a little more advanced than can be seen in a strict dorsal view.

The cutting edges bear well developed teeth, those of the immovable finger being the largest.

Ambulatory legs unarmed, smooth. The dactyli which remain intact are thin, elongate, and recurved at their tips.

Colour.—The single dried example is brown above, lighter on the limbs, and creamish on the sternum and abdomen. Hand of the large cheliped whitish externally.

Described from the dried male holotype of the species, which is recorded by Haswell as having been dredged in Port Jackson, New South Wales, and is the only specimen known. It is considerably damaged, and its imperfections can be gleaned from the figure. It will be noticed particularly that the smaller hand is now missing from the holotype. Haswell describes this in the following extract: "granular over all the outer surface with the exception of a triangular space near the base of the mobile finger, the former only granular near the base, a granular ridge near the lower border of the propoda of both chelipedes, becoming entire on the digital portion to the apex of which it extends."

Discussion.—Miers (1886, *tom. cit.*) was the first author to observe that Haswell's "*P. integer*" could not be retained in the genus *Pilumnus*. The question then lapsed until taken up by Dr. Mary Rathbun prior to the publication of her paper in 1923 (*tom. cit.*), when she reviewed all the Australian species described in the genus *Pilumnus*. In her published paper she stated that the above species of Haswell's "should be referred to *Chasmocarcinus* or a kindred genus." This decision, like that of Miers, was based only on a study of Haswell's original descriptions of "*P. integer*." Later a drawing of the holotype of "*P. integer*" was prepared at the Australian Museum and forwarded to Dr. Rathbun for her further information. With this supplementary knowledge she then suggested either the genus *Mertonia*, or *Xenophthalmodes* Richters, as being more correct receptacles for "*P. integer*." The present study of the species is the outcome of Dr. Rathbun's kindly guidance.

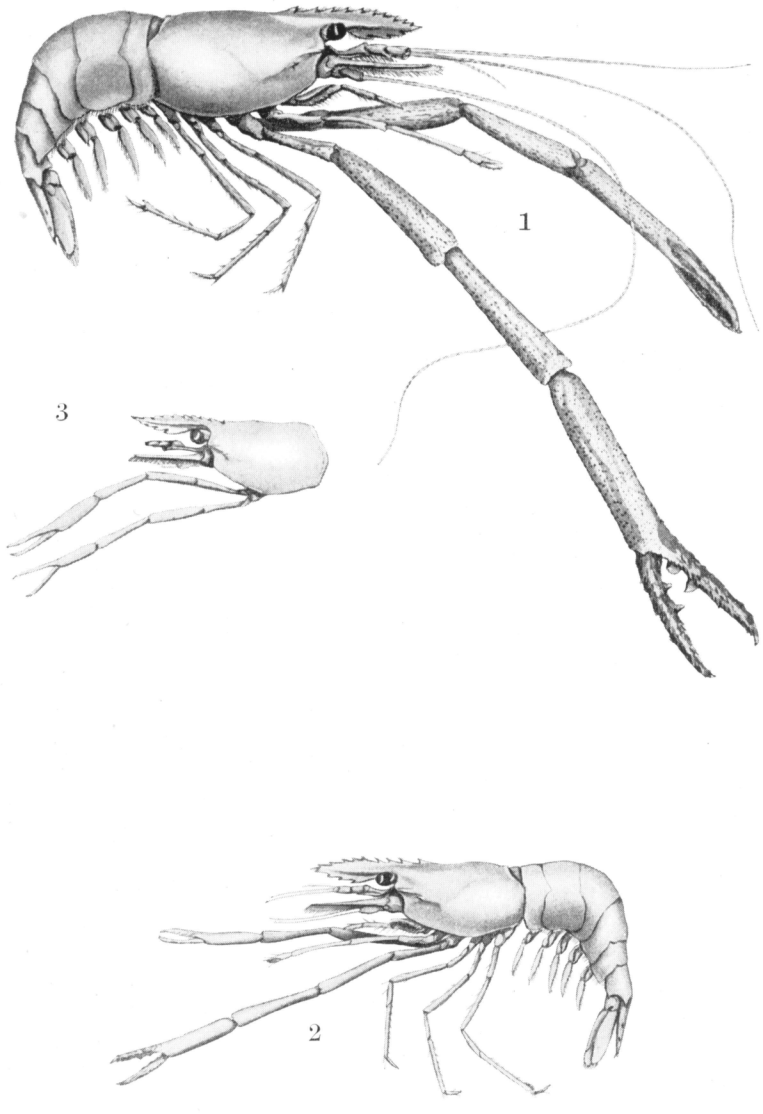
EXPLANATION OF PLATE XXXV.

Palæmon (*Parapalæmon*) *australis* (Ortmann).

Fig. 1. Adult male specimen from Pallal, Horton River near Bingara, N. S. Wales (natural size).

Fig. 2. Adult female specimen from same locality (natural size).

Fig. 3. Juvenile specimen from same locality (about $1\frac{1}{2}$ times natural size).



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Frank A. McNeill, del.

EXPLANATION OF PLATE XXXVI.

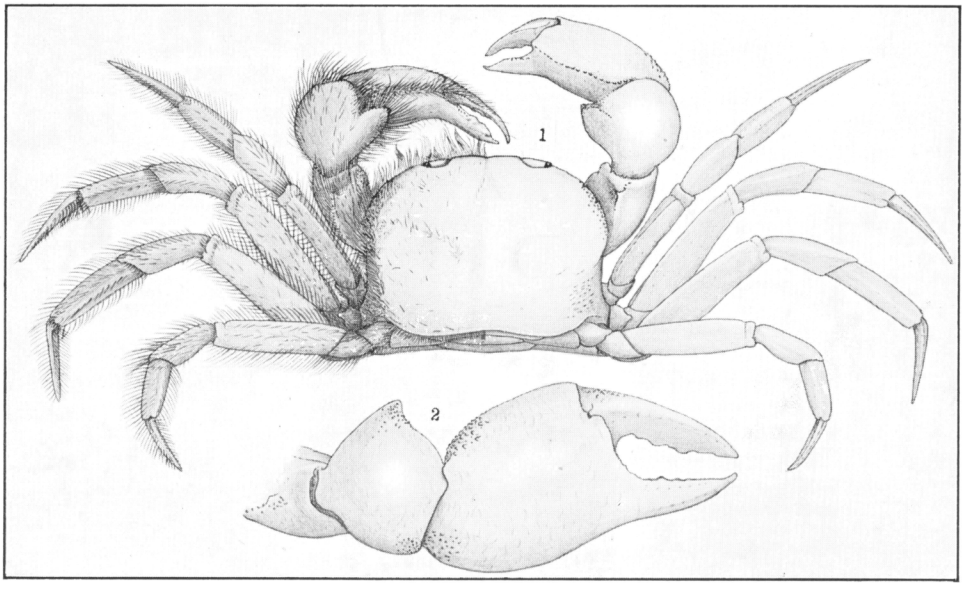
Speocarcinus luteus sp. nov.

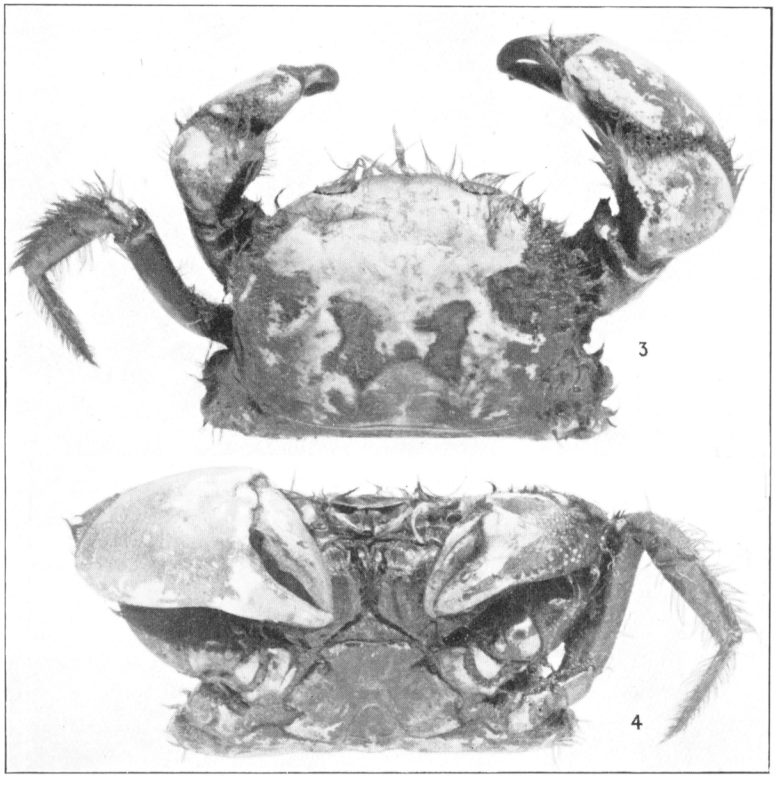
Fig. 1. Male holotype (half denuded). Carapace 21 mm. wide.

Fig. 2. Wrist and hand of right cheliped of same (enlarged).

Fig. 3. Dorsal view of incomplete male paratype. Carapace 20 mm. wide.

Fig. 4. Ventral view of same.





Gilbert P. Whitley and
Frank A. McNeill, del. (1-2).

C. R. Shoemaker, photo. (3-4).

EXPLANATION OF PLATE XXXVII.

Mertonia integra (Haswell).

Fig. 1. Male holotype (damaged). Carapace 8·5 mm. wide.

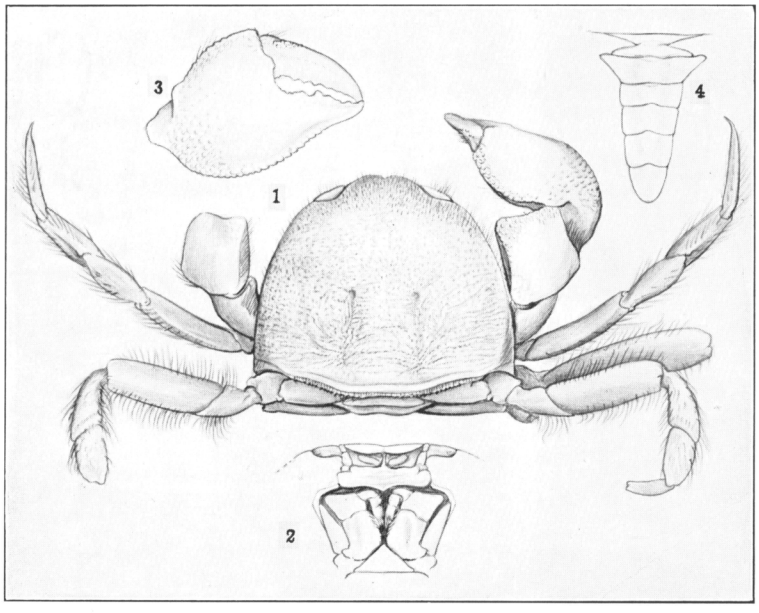
Fig. 2. Ventral view of same to show maxillipeds, epistome, etc.

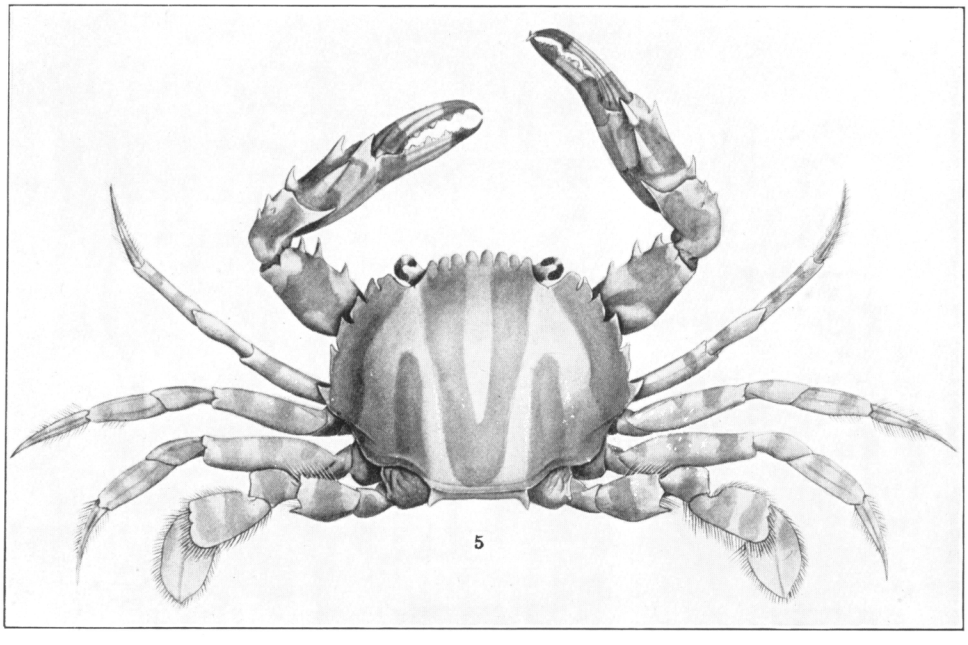
Fig. 3. Right or major hand of same.

Fig. 4. Abdomen of same.

Charybdis cruciata (Herbst).

Fig. 5. Young female specimen from Kogarah Bay, in Botany Bay, N. S. Wales. Carapace 43 mm. wide between the tips of the postero-lateral spines.





Allan R. McCulloch and F. A. McNeill, del. (1-4).
J. R. Kinghorn, del. (5).