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CARCINOLOGICAL NOTES.

No. I.

By

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and

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(With Plates lix-lxi and one Figure.)

Under the above title the authors contemplate publishing from time to time observations of interest on the Australasian Decapod and Stomatopod fauna. These will be in the form of accumulated notes on various species and not associated with projected contributions on representative collections from circumscribed areas. In effect, the object of the authors is to cleanse the Australasian literature, and present, incidentally, the knowledge that has been gained since the early work on the various species.

In the present paper many additions to the Australian fauna are recorded, and a number of old records are confirmed.

Some of the new records extend considerably the ranges of the species. In this regard *Eriphia norfolcensis* is recognized for the first time outside of its type locality (Norfolk Island, South Pacific) from the coast of New South Wales, and it is significant that no specimens of the species have ever come to hand from other localities on the eastern Australian coastline, which apparently have an environment more nearly approaching that of the type locality, and where intensive collecting has been carried out. Also, there is the recognition of the species *Cancer novae-zealandiae*, formerly regarded as endemic in New Zealand, from the far removed Derwent River estuary in Tasmania, and from Port Phillip, Victoria.

Another point of interest is the recognition of a number of New South Wales species in South Australian waters. There is a close affinity between the Decapoda and Stomatopoda of these two States which has not been stressed in the past.

For the acquisition of some valuable species we are indebted to Captain L. Comtesse, master of the Sydney Harbour Trust's sand dredge "Triton." Captain Comtesse has brought to light a hitherto unsuspected array of specimens, crustacean and molluscan¹ and his collecting has enabled us to confirm several early records of typical tropical forms which had formerly been viewed with some doubt.

¹ Iredale.—Austr. Zoologist, v, 4, 1929, p. 337.

Family PANDALIDÆ.*Genus* PANDALUS *Leach.*PANDALUS LEPTORHYNCHUS *Stimpson.*

Pandalus leptorhynchus Stimpson, Proc. Acad. Nat. Sci. Philad., xii, 1860, p. 38. *Idem*, Haswell, Cat. Austr. Crust., 1882, p. 197. *Idem*, Whitelegge, Journ. Roy. Soc. N. S. Wales, 1889, p. 224 (record only). *Idem*, Grant, in Sayce, Victorian Naturalist, xviii, 10, 1902, p. 155. *Idem*, de Man, "Siboga" Expd., Monogr. xxxix^a, Decapoda, pt. iv, 1920, p. 103.

Parapandalus leptorhynchus Hale, Crust. S. Austr., pt. i, in Handbooks Flora and Fauna S. Austr., 1927, p. 43, fig. 34; and var. *gibber* Hale, *tom. cit.*, p. 44, fig. 35.

It is sixty-nine years since the original description of this species appeared, being based by Stimpson on material from Port Jackson, New South Wales, whence the form has not since been collected. In later years Haswell and then Whitelegge recorded the species on the authority of its author. The late F. E. Grant recognized the form from Port Phillip, Victoria, and our examination of specimens now in the Australian Museum collection and obtained at the above-mentioned locality by that author, confirms his determination. Again, Hale has established that the form occurs in dredgings in St. Vincent Gulf, South Australia.

Recently acquired specimens are in the Australian Museum from Botany Bay, New South Wales, which is close to the type locality (Port Jackson), and these confirm the occurrence of the species on the New South Wales coast, where it is perhaps not uncommon when dredged under certain conditions.

Material.—Six specimens from vicinity of Kurnell, Botany Bay, N. S. Wales; dredged in three fathoms from amongst seaweed on a bottom of sand; coll. M. Ward and F. A. McNeill, 1927. There are additional specimens in the Australian Museum from Port Phillip, Victoria (dredged), one specimen; coll. M. Ward.

Port Phillip, Victoria (dredged near entrance), two specimens; late F. E. Grant collection.

Flinders Island, Bass Strait (dredged in ten fathoms), four specimens; coll. W. E. J. Paradice, R.A.N., 1924.

George's Bay, N. E. Tasmania (dredged in 4½–3 fathoms); coll. Prof. T. T. Flynn, 10.2.1927.

Family HIPPOLYTIDÆ.*Genus* HIPPOLYTE *Leach.*HIPPOLYTE TENUIROSTRIS (*Spence Bate*).

Caradina tenuirostris Spence Bate, Proc. Zool. Soc. London, 1863, p. 501, pl. xl, fig. 4.

Virbius tenuirostris Ortmann, Proc. Acad. Nat. Sci. Philad., pt. iii, 1894, p. 406.

Hippolyte tenuirostris Hale, Crust. S. Austr., pt. i, in Handbooks Flora and Fauna S. Austr., 1927, p. 51, fig. 43; and Trans. Roy. Soc. S. Austr., li, 1927, p. 308, fig. 1.

This species is here recognized for the first time outside the waters of St. Vincent Gulf, South Australia. In the Australian Museum collection there are two ovigerous females from Botany Bay, New South Wales; they were dredged from amongst seaweeds growing on a bottom of sand in about fifteen feet of water. One specimen measures 5.5 mm. from the tip of the rostrum to the end of the carapace, and is approximately 18 mm. in total length; the other is slightly smaller in size.

We are indebted to Mr. H. M. Hale, Curator of the South Australian Museum, for the determination of the specimens.

Genus LATREUTES *Stimpson.*

LATREUTES TRUNCIFRONS (*Spence Bate*).

Caradina truncifrons Spence Bate, Proc. Zool. Soc. London, 1863, p. 499, pl. xl, fig. 2; and "Challenger" Zool., xxiv, 1888, Macrura, p. 582.

Latreutes truncifrons Ortmann, Proc. Acad. Nat. Sci. Philad., pt. iii, 1894, p. 406. *Idem*, Hale, Crust. S. Austr., pt. i, in Handbooks Flora and Fauna S. Austr., 1927, p. 51, fig. 44; and Rec. S. Austr. Mus., iv, No. 1, 1928, p. 93, fig. 20.

Like the preceding species, this form has not previously been recognized outside of St. Vincent Gulf, South Australia, and the present record considerably extends its range.

A single female example (with characteristically truncated rostrum) was collected in Gunnamatta Bay, Port Hacking, New South Wales, amongst weed in shallow water below low tide mark by Messrs. H. M. Hale and F. A. McNeill, February, 1927. The specimen was unfortunately later mislaid, but was about 18 or 20 mm. in length.

Family PROCESSIDÆ.

Genus PROCESSA *Leach.*

PROCESSA AUSTRALIENSE *Baker.*

Processa australiensis Baker, Trans. Roy. Soc. S. Austr., xxxi, 1907, p. 185, pl. xxv, figs. 2-2e. *Idem*, de Man, "Siboga" Expd., Monogr. xxxixa³, Decapoda, pt. iv, 1920, p. 199, pl. xvii, figs. 51-51m (synonymy).

Processa australiense Hale, Crust. S. Austr., pt. i, in Handbooks Flora and Fauna S. Austr., 1927, p. 61, fig. 57.

Few references to this species occur in literature, and it is here recorded from New South Wales waters for the first time. The present record is based upon two ovigerous females measuring 8.5 mm. and 10 mm. from the tip of the rostrum to the end of the carapace; the largest specimen measures approximately 31 mm. from the tip of the rostrum to the end of the telson. While considerably larger than Baker's holotype both specimens agree perfectly with his description and figures, and the identification has been verified by Mr. H. M. Hale of the South Australian Museum, who compared one example with the holotype of *P. australiense*.

Locality.—Under stones between tide marks, Kurnell, Botany Bay, New South Wales. Coll. F. A. McNeill and M. Ward, 27th October, 1927.

Family STENOPIDÆ.

Genus STENOPUS Latreille.

STENOPUS HISPIDUS (*Olivier*).

Stenopus hispidus Rathbun, Bull. U.S. Fish Comm., xx, 1900 (1901), p. 99, pl. ii (and synonymy). *Idem*, Adams and White, Zool. H.M.S. "Samarang," Crust., pt. ii, 1849, p. 61, pl. 12, fig. 6. *Idem*, Balss, Beiträge zur Naturg. Ost. (Abhand. d. math.-phys. Klasse d. K. Bayer. Akad. d. Wissen., II Suppl.-Bd., 10 Abhand.), 1914, p. 73. *Idem*, McNeill in Austr. Encyclopædia, ii, Sydney, 1926, p. 326, and figure.

Except for its inclusion in the "Encyclopædia" account quoted above, this unique tropicopolitan shrimp has apparently not previously been recognized from Australian waters, and it is now possible to record it from several localities on the eastern coast of this continent. The most remarkable of these new records is a specimen in the Australian Museum series recently collected in temperate Port Jackson on the New South Wales coast, which is probably the most southerly record for the species.

Material.—One specimen from Garden Island, Port Jackson; coll. Lieut. N. Glover, R.A.N. (in hand-net), May, 1924. One specimen from Dunk Island, off Cardwell, Queensland; coll. E. J. Banfield, 1909. One specimen from Green Island, off Cairns, Queensland; "old collection." Two specimens from Low Isles, off Port Douglas, North Queensland; coll. W. E. J. Paralice, R.A.N., 1924. One specimen from Hope Islands, North Queensland; coll. A. R. McCulloch, 1913.

In addition to the above series there are specimens in the Australian Museum from the following extra-Australian localities: Lord Howe Island, South Pacific (three); reef, Waikiki, Honolulu, Hawaiian Islands (one); Vila Harbour, New Hebrides (two).

The specimens are of varied age and size, the largest being a male from Lord Howe Island, which measures 24.5 mm. from the tip of the rostrum to the end of the carapace.

Habits.—When the late A. R. McCulloch visited the New Hebrides some years ago, as a guest of the Admiralty on board H.M.S. "Pegasus," he noted that the "species was common, living among the thick growths of marine life on the hulk of the S.S. 'Titus' in Vila Harbour. *Stenopus* of all sizes up to about four inches long moved about in search of minute food matter, which they picked up with their chelipeds. Their striking red and white colouration made them very conspicuous, while their long delicate antennæ might be seen protruding from almost every crevice. Very young specimens were also caught on the surface at night in a net, being attracted, together with many other animals, by a brilliant electric light hung over the water."

Mr. M. Ward has collected the species on reefs, and observed that it frequents shallow water below low tide mark, where it may be searched for under movable dead coral blocks.

Colour.—Adams and White (*loc. cit.*) have published a very fine coloured figure of *Stenopus hispidus*, and the following notes made on the recorded Port Jackson female specimen when fresh will serve to supplement this.

Carapace pale sienna, with a median dorsal area tinged with green. Rostrum, anterior portion of carapace, eyes and bases of antennæ blood red, with still darker red patches. Large chelipeds each with four bands of similar red colour, two of which occur on the hands. Another red saddle across the middle of the abdomen, and one over the greater part of the last abdominal segment and base of the telson. Anterior portion of abdomen electric blue, largely by reason of the cobalt blue mass of eggs beneath, and the bases of all the legs deep violet. Uropods and most of telson porcelain white, with sienna markings. Flagella white, except where they are tinged with sienna towards their bases. Meral and carpal joints of all the limbs more or less tinged with sienna upon a ground of porcelain white.

STENOPUS ROBUSTUS *Borradaile*.

Stenopus robustus Borradaile, Trans. Linn. Soc. London, Zool., (2), xiii, 2, 1910, p. 260, pl. 16, fig. 4. *Idem*, McNeill, Austr. Zoologist, iv, 5, 1926, p. 302.

One of us (McNeill) first recorded this species from Australia in 1926, and apparently there are only two references to it in literature.

It is therefore interesting to note the discovery of further specimens in the collection of the Australian Museum from the eastern Australian coastline, where the species seems to be well established.

Material.—Three specimens from Masthead Island, Capricorn Group, Queensland, reef; coll. D. B. Fry. Four specimens from Hope Islands, near Cooktown, North Queensland, reef; coll. A. R. McCulloch. One specimen from Long Reef, Collaroy, on coast near Port Jackson, New South Wales, between tide marks; coll. M. Ward, 1924. The largest specimen in the present series measures 7 mm. from the tip of the rostrum to the end of the carapace.

Distribution.—Chagos Archipelago (type locality), and eastern Australian coastline.

Family CALLIANASSIDÆ.

Genus UPOGEBIA *Leach.*

UPOGEBIA SIMSONI (*Thomson*).

Gebia simsoni Thomson, Proc. Roy. Soc. Tasmania, 1892, p. 49, pl. i, figs. 3-5.

Upogebia simsoni Fulton and Grant, Proc. Roy. Soc. Victoria, n.s., xiv, 1902, p. 61, pl. v, figs. 5-6. *Idem*, McNeill, Austr. Zoologist, iv, 5, 1926, p. 305. *Idem*, Hale, Crust. S. Austr., pt i, in Handbooks Flora and Fauna S. Austr., 1927, p. 85; and Trans. Roy. Soc. S. Austr., li, 1927, p. 309.

A fine series of this species in the Australian Museum constitutes an addition to the New South Wales fauna, as well as an intermediate link in a long chain of distribution along the eastern and southern Australian coastline. The specimens provide another proof of the parallel nature of much of the New South Wales and South Australian decapod faunas.

Material.—Twenty-five specimens ranging from 6 to 10 mm., measured from the tip of the rostrum to the end of the carapace.

All were found hiding in accumulations of sand where clusters of shell-covered worm tubes occurred at the edge of a reef immediately below low tide mark at Kurnell, Botany Bay, New South Wales; coll. Messrs. F. A. McNeill and M. Ward, October 27, 1927, and January 21, 1928.

Another solitary specimen (carapace 7.5 mm. long) from Port Jackson, also in New South Wales, was collected by F. A. McNeill from a burrow in sand amongst stones between tide marks at Bottle and Glass Rocks on November 1, 1929.

Distribution.—East coast Tasmania (Thomson); Flinders, Western Port, Victoria (Fulton and Grant); North-west Islet, Capricorn Group, Queensland (McNeill).

Family PORCELLANIDÆ.*Genus* POLYONYX *Stimpson.*POLYONYX TRANSVERSUS (*Haswell*).

(Plate lix, fig. 3.)

Porcellana transversa Haswell, Cat. Austr. Crust., 1882, p. 150 (and reference).

Polyonyx transversus Baker, Trans. Roy. Soc. S. Austr., xxix, 1905, p. 262, pl. xxxvi, figs. 2-2a. *Idem*, Hale, Crust. S. Austr., pt. i, in Handbooks Flora and Fauna S. Austr., p. 63, fig. 80.

Although first described from Bowen in Port Denison, Queensland, and later recorded by Baker from South Australian waters, this species has not previously been recognized from an intermediate locality.

In the Australian Museum there are two male examples (carapaces 9 and 11 mm. wide) from stations in Botany Bay, New South Wales, which agree perfectly with the two type specimens housed in the same institution and constitute an addition to the fauna of the State. Both specimens were taken from "U"-shaped worm tubes, occupied by a species of the polychæt *Chaetopterus*, where they were found reclining in the inflated basal portion of their sanctuaries, at a depth of about fourteen inches from the surface of the tidal flats exposed at low tide.

Mr. M. Ward collected a series of the species for the Australian Museum in July, 1929, from similar worm tubes occurring in the mud flats at low tide on Curtis Island in Port Curtis, Queensland. He remarked they were found in the soft mud at the extreme low tide line, or close thereto in shallow drains and pools. In each worm tube examined a male and female crab were present. The tubes were not more than one foot deep in the mud, and, owing to the fragile nature of their structure, great difficulty was experienced in digging them out.

Larger New South Wales specimen: Vicinity of Taren Point, near mouth of George's River, December, 1925. Smaller New South Wales specimen: Weenie Bay, south of Kurnell, June, 1928. Collected by G. Fraser.

Amongst some pencilled notes left by the late F. E. Grant is one referring to the collection of a single specimen of this species (afterwards presented to the British Museum) from "off Honey-suckle Point, Western Port, [Victoria] (4 faths)." Verification of this record is provided by the presence of a small male of the species labelled "Western Port" in the collection of the National Museum, Melbourne, Victoria, recently examined by Mr. M. Ward, and forming part of the late F. E. Grant collection.

Discussion.—Hale has noted that the species "is apparently very rare in South Australian waters." The fact that so very few specimens have been recorded, however, combined with the evidence already to hand, suggests that the creature, like other species of the genus, is invariably a commensal. This would account for its apparent rarity in collections.

Genus PACHYCHELES *Stimpson.*

PACHYCHELES SCULPTUS (*H. M. Edwards*).

Porcellana sculpta H. M. Edwards, Hist. Nat. Crust., ii, 1837, p. 253.

Pachycheles sculptus de Man, Abh. Senck. Naturf. Ges., xxv, 3, 1902, p. 701. *Idem*, Grant and McCulloch, Proc. Linn. Soc. N. S. Wales, xxxi, 1, 1906, p. 40, pl. ii, fig. 1 (references and synonymy) and xxxii, 1, 1907, p. 155. *Idem*, Balss, Beiträge zur Naturg. Ost. (Abhand. d. math.-phys. Klasse d. K. Bayer. Akad. d. Wissen., II Suppl.-Bd., 9 Abhand.), 1913, p. 32.

A series of five specimens recently collected in New South Wales by M. Ward verifies the occurrence of this unmistakable species in an area far removed from its usual tropical environment. Grant and McCulloch (*loc. cit.*, 1906) noted the existence of New South Wales specimens in the Australian Museum collection, but these were Old Collection material even in those days, and we have considered that the record warranted confirmation. It would appear that the species occurs sporadically, or, being a commensal of encrusting sponges, has been overlooked by collectors in the past.

Material.—Two males and two females, and one immature juvenile, with carapaces ranging from 3 mm. to 5.5 mm. in width, from Long Reef, Collaroy, coast north of Port Jackson; in canals of a tough encrusting sponge on the under surfaces of flat stones occurring in shallow water below low tide mark. Collected by M. Ward, April 21, 1928.

Two males, with carapaces measuring 5 and 5.5 mm. wide, from Cabbage Tree Bay (Shelly Beach), Manly, on coast north of Port Jackson, New South Wales; collected by the late Thomas Whitelegge, Australian Museum. These are the specimens on which Grant and McCulloch's record of 1906 was based.

There are eight other specimens, in the Australian Museum from Masthead Island, Capricorn Group, Queensland; collected by Grant and McCulloch (see record, 1906).

Family LEUCOSIIDAE.

Genus EBALIA *Leach.*

Subgenus PHLYXIA *Bell.*

EBALIA (PHLYXIA) DENTIFRONS *Miers.*

Ebalia (Phlyxia) dentifrons Miers, "Challenger" Zool., xvii, 1886, Brachyura, p. 310, pl. xxv, fig. 4.

Ebalia dentifrons Fulton and Grant, Proc. Roy. Soc. Victoria, n.s., xix, pt. 1, 1906, p. 20. *Idem*, Ihle, "Siboga" Expd., Monogr. xxxixb², *Decapoda Brachyura* III, 1918, p. 310.

Phlyxia dentifrons Hale, Crust. S. Austr., pt. i, in Handbooks Flora and Fauna S. Austr., 1927, p. 200, fig. 201.

Although originally described from South Australian waters, this species, like others here recorded, is possibly more plentiful on the coast of New South Wales. Hale states that the form is rather rare in South Australia, and mentions that it has been collected in New South Wales. The latter statement was based on that author's examination of material of the species in the Australian Museum during a visit in 1927. In spite of the fact that, strictly speaking, the species has been recorded from New South Wales, we feel that further details of the actual material and localities are essential to consolidate the record.

Material.—Four females from Port Jackson, New South Wales; one female from Botany Bay, N. S. Wales. The largest specimen from N. S. Wales is a Port Jackson female 11 mm. wide. Other specimens in the Australian Museum are: One male from Beaumaris, Port Phillip, Victoria (dredged); one male from Flinders, Victoria; one female from the general locality—"South Australia."

The largest specimen examined is the male from Beaumaris, which is 12 mm. wide.

Occurrence.—Its occurrence in New South Wales is interesting from the fact that it may be dredged from depths up to five fathoms, and is also found on shore reefs in the shallows just below low tide level. In the latter situations it particularly favours clusters of shell-covered worm tubes found growing in accumulations of sand and shell grit, amongst which the crabs lie concealed until the mass is torn from its anchorage and rent apart.

EBALIA (PHLYXIA) RAMSAYI *Haswell*.

(Plate lx, figs. 3-4.)

Phlyxia ramsayi Haswell, Proc. Linn. Soc. N. S. Wales, iv, 1, 1879 (1880), p. 55. *Idem*, Haswell, Cat. Austr. Crust., 1882, p. 127. *Idem*, Miers, Zool. "Alert," 1884, p. 252. *Idem*, Whitelegge, Journ. Roy. Soc. N. S. Wales, 1889, p. 230 (mention only).

Ebalia (Phlyxia) ramsayi Miers, "Challenger" Zool., xvii, 1886, *Brachyura*, p. 305.

Besides Haswell's female holotype there are two other examples of this species in the collection of the Australian Museum. The form has not been recorded since it was originally described nearly forty years ago. As no figure of the species was given by Haswell, the present opportunity is taken to publish a photograph of the holotype.

Material.—One female from Port Jackson, N. S. Wales. Carapace 7 mm. wide, old collection. One female from Kurnell, Botany Bay, N. S. Wales; shore, 22.1.1928. Carapace 8 mm. wide. Mr. Melbourne Ward has an additional female specimen in his private collection from between tide marks at Long Reef, Collaroy, on coast north of Port Jackson, N. S. Wales. The male of the species is not known. A remeasurement of the holotype proves it to be 9 mm. wide.

Occurrence.—The species is found under similar conditions to those enumerated for *Ebalia (Phlyxia) dentifrons*.

LEUCOSIDES *Rathbun*.

Leucosides Rathbun, Proc. Biol. Soc. Wash., xi, 1897, p. 160; Proc. U.S. Nat. Museum, xxvi, 1902, p. 30.

LEUCOSIDES LONGIFRONS (*de Haan*), var. PULCHERRIMA (*Miers*).

Leucosia splendida Haswell, Proc. Linn. Soc. N. S. Wales, iv, 1, 1879, p. 47, pl. 5, fig. 1; and Cat. Austr. Crust., 1882, p. 119. *Idem*, Cox, Proc. Linn. Soc. N. S. Wales, vi, 2, 1881, p. 197. *Idem*, Whitelegge, Journ. Roy. Soc. N. S. Wales, 1889, p. 230 (record only).

Leucosia longifrons, var. *pulcherrima* Alcock, Journ. Asiat. Soc. Bengal, n.s., lxxv, pt. ii, no. 2, 1896, p. 219 (refs. and syn.).

It is now forty-nine years since Haswell described his *L. splendida* from Port Jackson, and no further evidence of its presence at that locality had come to hand until the receipt of two well preserved carapaces in July, 1929. These were presented to the Australian Museum by Capt. L. Comtesse, the master of the Sydney Harbour Trust's sand dredge "Triton," and were drawn up from about 6 fathoms in the vicinity of the Sow and Pigs Shoal. Both carapaces bear the characteristic markings of the variety *pulcherrima* Miers, and it is interesting to note that the trefoil markings do not coalesce. This last was used by Haswell to separate his Port Jackson *L. splendida* from *L. pulcherrima* Miers, but it has since been accepted that the character is subject to variation. Haswell also noted that "the circular figures are more remote from one another and from the trefoil marks" than in *pulcherrima*. That this feature is possibly due to age is demonstrated by the present material. The smaller carapace has the markings in much closer apposition and they appear more crowded than in the larger (carapaces 13.5 and 15.5 mm. wide respectively).

The female holotype of *L. splendida* is in the collection of the Australian Museum, and measures 22.5 mm. across the widest part of the carapace.

The variety is not uncommon in the tropical waters of eastern Australia. There are seventeen examples of both sexes in the Australian Museum collection from Port Denison and Dunk Island, Queensland, and Murray Island and Darnley Island, Torres Strait.

Cox (*loc. cit.*) refers to a plentiful supply of the variety at the Tweed River, northern New South Wales, but no further specimens have been reported from this locality, and no opportunity has presented itself to check the observation. None of the specimens of this record can be traced.

Leucosia polita Hess² is the only other species of *Leucosides* recorded from the temperate locality of Port Jackson, and is later quoted and requoted respectively by Haswell (*tom. cit.*, 1882, p. 120) and Whitelegge (*t.c.*, 1889, p. 230) on the authority of its author. Alcock (*t.c.*, 1896, p. 217) places the species in the synonymy of *Leucosides longifrons* (de Haan), quoting de Man³ as his authority for this action. Unfortunately no trace of any such synonymy by de Man can be traced, either in the journal named by Alcock or elsewhere, which suggests a misquotation. On the evidence, however, we agree that Hess' species can be as well accommodated in its present position as elsewhere, for his description is meagre, and the figure accompanying it illustrates only a deformed cheliped. The now confirmed occurrence of *L. longifrons*, var. *pulcherrima* in Port Jackson strengthens the possibility of the presence of the typical form and a verification of Hess' Sydney record. But, owing to the fact that many of the species attributed to Sydney by Hess have not since been found, and are obviously incorrectly recorded (*e.g.*, several species of *Uca* and *Sesarma*), it is very probable that his *Leucosia polita* also was not collected there.

LEUCOSIDES HÆMATOSTICTA (*Adams and White*).

(Plate lx, figs. 7-8.)

Leucosia hæmatosticta Adams and White, Zool. H.M.S. "Samarang," Crust., pt. 2, 1849, p. 54, p. xii, fig. 2. *Idem*, Alcock, Journ. Asiat. Soc. Bengal, n.s., lxxv, pt. ii, no. 2, 1896, pp. 214, 229 (references). *Idem*, Ihle, "Siboga" Expd., Monogr. xxxixb², Decapoda Brachyura iii, 1918, pp. 305, 306 (references).

We are able to record two examples of this well characterized Indo-Malaysian species from localities on the eastern Australian coastline; they constitute an addition to the Australian Decapod fauna, and add considerably to the range of the form.

Material.—One female example from Bowen Harbour, Port Denison, Queensland; collected by E. H. Rainford in 1923 on a

² Hess.—Archiv für Naturg., Jahrg. xxxi, 1865, p. 155, pl. vi, fig. 14.

³ de Man.—Zool. Jahrbüch. Syst., etc., ii, 1892, p. 585 (*vide* Alcock).

muddy sandbank exposed at low tide (Australian Museum collection); one male from near Shark Beach, Port Jackson, New South Wales, dredged on May 10, 1929, in 2-3 fathoms, by M. Ward (M. Ward collection, Sydney).

Both specimens measure 13 mm. across the widest part of the carapace.

The Port Jackson record is remarkable, and adds another example to the list of tropical species recently proved to occur spasmodically at this temperate locality.

Distribution.—Indian seas, Malay Archipelago, and eastern Australian coastline.

Genus PHILYRA Leach.

PHILYRA PLATYCHEIRA de Haan.

(Plate lx, figures 5-6; and Figure 1.)

Philyra platycheira de Haan, in Siebold's Fauna Japonica, Crust. v, 1841, p. 132, pl. xxxiii, fig. 6. *Idem*, Balss, Archiv für Naturg., 88 Jahrg., Abt. A., Heft 3, 1922, p. 128 (references).

Philyra platychira Alcock, Journ. Asiat. Soc. Bengal, n.s., lxxv, pt. ii, no. 2, 1896, pp. 238, 242 (references, but ? syn.).

Philyra platycheira Stimpson, Smith. Miscell. Coll., xlix, No. 1717, 1907, p. 154.

Three carapaces (10 to 12 mm. wide) have just been presented to the Australian Museum, and are considered referable to this

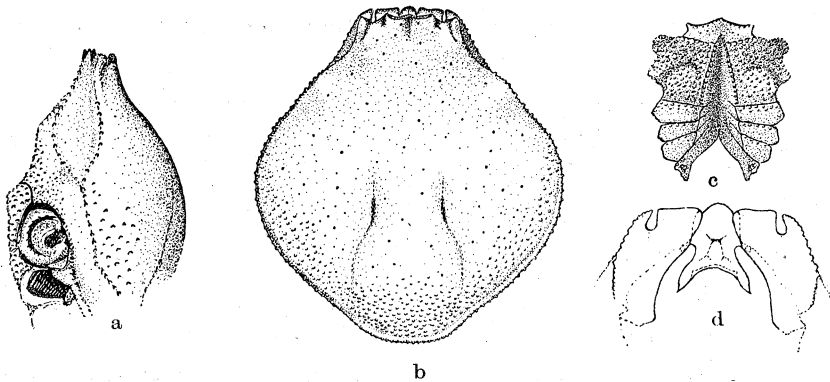


Figure 1.

Philyra platycheira de Haan. a, lateral view; b, dorsal view; c, sternum; d, epistome. Example from Port Jackson; 11 mm. wide.

species. One of the series has the sternum intact, and is that of a male; this has been used for the purpose of figuring the species in the present paper.

The important discovery of the specimens was made by Capt. L. Comtesse, who secured them from a depth of about 6 fathoms in the vicinity of the Sow and Pigs Shoal, Port Jackson, New South Wales.

A survey of the Museum reference collection revealed another previously unrecognized Australian specimen of the same species, a male (carapace 11.5 mm. wide) with chelipeds intact, but minus the ambulatory limbs. This was dredged in Albany Passage, north Queensland, by Messrs. C. Hedley and A. R. McCulloch in August, 1907. The characters of the carapace agree perfectly with the Port Jackson specimens, and the chelipeds are exactly as described by both de Haan and Alcock (*loc. cit.*).

The species has not previously been recognized from the Australian coastline, apart from the unsubstantiated mention of "Australische Küste" in the distribution given by Balss (*loc. cit.*), which is included below, and the record of a female example doubtfully designated by Miers in 1886⁴ from 2-10 fathoms off the South Australian coast. This last-named author notes that his specimen had the pterygostomium regions "but very slightly angulated." As the present specimens agree in this particular with Miers', there is more than a possibility that the two records represent one and the same form. This is strengthened by the fact, stressed elsewhere in this paper, that there is a marked affinity between the crustacean fauna of New South Wales and South Australian waters. Further, Alcock (*loc. cit.*) does not stress the form of the pterygostomium regions in his description of *P. platycheira*, although they are depicted in de Haan's figure as nearly angular, and not definitely obtuse as in the local specimens before us, which we have critically compared with a male example of the species received in exchange by M. Ward from Ceylon. Nevertheless, there is complete agreement with the other important characters of the front, epistome and chelipeds as described by Alcock. De Haan's description is supplemented by Stimpson (*loc. cit.*), who notes the microscopic granulation of the carapace and its disposition. With this character also our specimens completely agree. Unfortunately, we have not been able to examine Japanese specimens, but feel that de Haan's figure is a little faulty in its outline.

Synonymy.—An apparently more granular form (*P. longimana*) from New Caledonia, with well marked cardio-branchial grooves extending forward on to the markedly produced anterior portion of the carapace, was described and figured by A. M. Edwards.⁵ This

⁴ Miers.—"Challenger" Zool., xvii, 1886, Brachyura, p. 321.

⁵ A. Milne Edwards.—Nouv. Archiv. du Mus. Paris, x, 1874, p. 43, pl. 2, fig. 4.

was considered by de Man⁶ as closely allied to, and probably a variety of *P. platycheira*, but Alcock has definitely placed it in the synonymy of that species. We, however, would like further verification of Alcock's action, or a better acquaintance with the New Caledonian Decapod fauna before being satisfied that the two names are referable to one and the same species.

Affinity.—Ortmann's *P. syndactyla* from Japan⁷ is a closely related species, but, though it has the antero-lateral outline as in *P. platycheira* of authors, the three main differences set out by Balss (*tom. cit.*, 1922, p. 129, fig. 7) appear sufficient to separate the two. In the character of the hand alone, *P. platycheira* has the fingers greatly flattened, with the cutting edges touching throughout their length, and the movable one is so strongly curved as to appear scythe-like. On the other hand, *P. syndactyla* is shown to have more slender and gaping fingers (*vide* Ortmann's figure, *loc. cit.*, and Parisi⁸), with the cutting edges unadorned with hair as in *P. platycheira*.

Distribution.—Japan (de Haan—type locality); Hongkong (Stimpson); South Australia (Miers); Philippines (Bell); Mergui Archipelago (de Man, Alcock); Andamans, Karachi, and Persian Gulf (Alcock); Dar-es-Salaam (Ortmann); "Dar-es-Salam, Rotes Meer, India, Japan, Australische Küste" (Balss); Ceylon (Laurie); Port Jackson, N. S. Wales, and Albany Passage, Queensland (McNeill and Ward—this paper).

Genus HETEROLITHADIA Wood-Mason (Alcock).

HETEROLITHADIA FALLAX (Henderson).

(Plate lx, figs. 1-2.)

Ebalia fallax Henderson, Trans. Linn. Soc. London, (2), Zool., v, 10, 1893, p. 402, pl. xxxviii, figs. 4-6.

Heterolithadia fallax Alcock, Journ. Asiat. Soc. Bengal, n.s., lxxv, pt. ii, no. 2, 1896, p. 261. *Idem*, Ihle, "Siboga" Expd., Monogr. xxxixb², Decapoda Brachyura iii, 1918, p. 254 (references).

? *Leucosilia maldivensis* Borradaile, Fauna and Geography Maldives and Laccadive Archipelagoes, i, 4, 1903, p. 438, text-fig. 117.

A recent valuable acquisition to the Australian Museum is a locally collected male example of the above species, which measures 12 mm. across the widest part of the carapace. A female specimen (carapace 14 mm. wide) has also been discovered in the collection, and is undoubtedly referable to the same species. These are the first of their kind to be recorded from Australian waters, and considerably extend the known range of the form.

⁶ de Man.—Journ. Linn. Soc. Zool., xxii, 1888, p. 201.

⁷ Ortmann.—Zool. Jahrb., Syst., vi, 1892, p. 583, pl. 26, fig. 18.

⁸ Parisi.—Atti. del. Soc. Ital. di Sci. Nat., liii, 1914, p. 17, fig. 2.

Henderson's description is in perfect agreement with our specimens, but it is almost certain that the carapace he figured is that of his female or larger specimen, in which the flat tops of the tubercles are depicted as less enlarged than in the Australian Museum male. Our female specimen, which is only two-thirds the width of that recorded by Henderson, has the tubercles with narrow flat tops, and, though these are as numerous as in the other sex, their narrow extremities give the impression that they are less crowded on the carapace.

Material.—One male, dredged near Michaelmas Reef cay, Great Barrier Reef, off Cairns, north Queensland, 11 fathoms, hard bottom of foraminifera, sand and mud; coll. Messrs. C. Hedley, T. Iredale and G. P. Whitley, June 5, 1926. One female, dredged off Hope Islands, near Cooktown, north Queensland; coll. A. R. McCulloch, 1905.

Synonymy.—There is a strong possibility that Borradaile's *L. maldivensis* is identical with the above species. Borradaile does not state the sex of his unique specimen, but the figure shows a marked similarity to our Queensland female of *H. fallax*, particularly in the character of the tubercles. The breadth, too, is only 2 mm. less than in our female specimen, and both agree in that they are whitish in alcohol; the Australian male specimen is creamy to light brown in colour, with the bases of the chelipeds slightly stained with pink. A feature which requires verification is the character of the antero-lateral knobs. In our specimens these are more conspicuous than in Borradaile's figure of *L. maldivensis*, but the illustration may be faulty, and as the author makes no reference to the character of the knobs, it would be profitable to await an opportunity of examining his holotype or a photograph thereof before coming to a final decision on the matter.

Distribution.—Gulf of Manaar, India (Henderson, Laurie); Andaman Islands and Orissa coast, India (Alcock); Stn. 104, Sulu Sea, Malay Archipelago (Ihle).

Genus EBALIOPSIS Ihle.

EBALIOPSIS EROSA (*A. Milne Edwards*).

(Plate lxi, figs. 1-2.)

Ebalia erosa Alcock, Journ. Asiat. Soc. Bengal, n.s., lxxv, pt. ii, no. 2, 1896, pp. 186, 189 (original references and synonymy). *Idem*, Borradaile, Fauna Maldive and Laccadive Archipelagoes, i, pt. iv, 1903, p. 437.

Ebalia (Phlyxia) erosa Bouvier, Bull. Sci. Fr. et Belgique (7), xviii, 3, 1915, p. 222, text-fig. 18.

Ebaliopsis erosa Ihle, "Siboga" Expd., Monogr. xxxix^b, Decapoda Brachyura iii, 1918, p. 255 (refs. and syn.).

A Queensland female specimen of this species (carapace 10 mm. wide) has recently been added to the collections of the Australian Museum, thus establishing the undoubted occurrence of the form in Australian waters. A. Milne Edwards' original description was based on a specimen in the Godeffroy Museum said to have come from Bass Strait. As this habitat could only refer to the well-known south-eastern Australian passage, the record must be accepted with suspicion. There are no previous records of tropical Leucosiids from an Australian station so far to the southward, and we are inclined to the belief that the original specimen must have been wrongly labelled. Haswell's Australian record of the species (1882, see Alcock, *loc cit.*) was based on that of A. M. Edwards'. A photograph of the newly recognized example is submitted in this paper, and is the first complete picture to be published since A. M. Edwards' excellent figure appeared in 1874.⁹

Locality.—Dredged near Michaelmas Reef cay, Great Barrier Reef, off Cairns, Queensland; 11 fathoms; hard bottom of foraminifera, sand and mud; coll. Messrs. C. Hedley, T. Iredale and G. P. Whitley, June 5, 1926.

Distribution.—"Habite le détroit de Bass," and New Caledonia (A.M.E.); Mauritius, Fiji, and Savage Island (Miers); Fiji Islands (Ortmann); Maldive Archipelago and Andaman Island (Alcock); Maldive and Laccadive Archipelago (Borradaile); Mauritius (Bouvier); Paternoster Islands, Gisser Island, Banda Sea, and off south coast of Rotti, Malay Archipelago (Ihle).

Family CALAPPIDÆ.

Genus CALAPPA Fabricius.

CALAPPA PHILARGIUS (Linnaeus).

Calappa philargius Alcock, Journ. Asiat. Soc. Bengal, n.s., lxxv, pt. ii, no. 2, 1896, pp. 141, 145 (refs. and synonymy).

Calappa cristata Whitelegge, Journ. Roy. Soc. N. S. Wales, 1889, p. 231 (record only).

Whitelegge's lone Port Jackson, New South Wales, record appears to be the only notice of this species from Australian waters. The recent addition of several specimens to the Australian Museum collection confirms the occurrence of the form in Port Jackson, and it is interesting to note that the bulk of the localized material of the species in the same institution comes from New South Wales waters. The specimens before us establish a considerable extension of the species' range, seeing that its stronghold is the Indo-Malaysian and China Sea region, with a lone record from Samoa by Ortmann (see reference in Alcock, *loc. cit.*).

⁹ A. Milne Edwards.—Nouv. Archiv. du Mus. Paris, x, 1873, p. 47, pl. iii, fig. 2.

Material.—Four adult males from Port Jackson, New South Wales (it is probable that Whitelegge's record was based on one of these specimens); one adult male from Broken Bay, N. S. Wales; one adult male and one adult female from the general locality of New South Wales (one was obtained at the Sydney Fish Markets); one juvenile male (measuring 50 mm. between the tips of the posterolateral spines) from Bowen Harbour, Port Denison, Queensland.

The largest specimen in the series is the male from "New South Wales," which measures 105 mm. between the tips of the posterolateral spines.

In a letter to the late A. R. McCulloch, dated 4th June, 1912, the late J. D. Ogilby, then Ichthyologist at the Queensland Museum, stated that he had "obtained in Moreton Bay [southern Queensland] a magnificent *Calappa* about six inches [= 150 mm.] across, having a pair of large maroon spots on either claw, and a maroon horse-shoe [marking] around each eye; the general colour fawn with a tinge of lavender centrally." These remarks undoubtedly refer to the present species, and add another locality for its occurrence along the eastern Australian coastline. The size of the specimen seen by Ogilby probably constitutes a record.

Occurrence.—In New South Wales the species has been collected in shallow water where the bottom is soft and composed mainly or entirely of sand. Several specimens have been captured per medium of seine nets drawn by local fishermen.

Variation.—The juvenile Port Denison specimen before us has the carapace adorned with well marked but scattered tubercles, and many scattered granules occur inside the larger ones permanently present on the spines on the posterior border. Laterally several low longitudinal ridges can also be plainly seen. These characters occur irrespective of sex, gradually becoming modified with age, and when the full adult condition is attained there may be present only a few tubercles immediately behind the front. The growth variations are excellently shown in the figures of a juvenile and adult example of the species given by de Haan.¹⁰

CALAPPA HEPATICA (*Linnaeus*).

Calappa hepatica Haswell, Cat. Austr. Crust., 1882, p. 136. *Idem*, Whitelegge, Journ. Roy. Soc. N. S. Wales, 1889, p. 231. *Idem*, Alcock, Journ. Asiat. Soc. Bengal, n.s., lxx, pt. ii, no. 2, 1896, pp. 141, 142 (refs. and syn.). *Idem*, McNeill, Austr. Zoologist, iv, 5, 1926, p. 306. *Idem*, Ward, *tom. cit.*, v, 3, 1928, p. 243, and fig. on pl. xxvii.

¹⁰ De Haan.—In Siebold's Fauna Japonica, Crust. iii, 1837, p. 71, pl. xix, figs. 1-1b.

Although known from the Australian coast, this tropical Indo-Pacific species of box-crab has not been recognized from a temperate locality since Whitelegge recorded the species from Port Jackson in 1889. Prior to this Hess¹¹ recorded the species from "Sydney" under the synonym *Calappa tuberculata* but much doubt attaches to his records from this locality, as he listed also a host of truly tropical species which could not possibly have occurred there. Whitelegge's original material of the species is still in the Australian Museum, and recently another specimen has been acquired from a station farther south than Port Jackson.

Material.—One adult male (carapace 61 mm. wide), one juvenile male (carapace 17 mm. wide), and one juvenile female (carapace 23 mm. wide) from Port Jackson, New South Wales, old collection; one or more of this series formed the basis of Whitelegge's record. One juvenile male (carapace 24 mm. wide) from Shellharbour, New South Wales, between tide marks amongst sand and shell grit on the floor of a boulder strewn gutter. Collected G. McAndrew, 1923.

Although Miers¹² records *C. hepatica* from New Zealand on the authority of Heller, its occurrence is doubted by Chilton and Bennett.¹³ It therefore appears that the most southern locality at which the species has established itself is Lord Howe Island, eastward from the coast of New South Wales. There are ten examples of both sexes in the Australian Museum from this locality, which is rather remarkable for its possession of a coral reef and consequent coral fauna. Perhaps the Lord Howe Island stock has been responsible for the sparse New South Wales records of the species.

Family PARTHENOPIDÆ.

Genus ZALASIUS Rathbun.

Zalasius Rathbun, Proc. Biol. Soc. Washington, xi, 1897, p. 166 (proposed for *Trichia* de Haan, 1841; preoccupied by *Trichius* Fabricius, 1775, Syst. Entom., p. 40—Coleoptera).

Trichia de Haan, in Siebold's Fauna Japonica, Crust. v, 1841, p. 109 (type *T. dromiæformis* de Haan).

Macneillena Iredale, Austr. Zoologist, vi, 2, 1930, p. 175 (proposed for *Trichia* de Haan, 1841; preoccupied by *Trichia* Hartmann, 1840, Erd. u. Süsw. Gaster., p. 41—Mollusca).

Synonymy—The fact that *Trichia* de Haan was preoccupied by the molluscan genus *Trichia* Hartmann, was quite recently brought under our notice by Tom Iredale, and on receiving an assurance

¹¹ Hess.—Archiv für Naturg., Jahrg. xxxi, 1865, p. 157.

¹² Miers.—Cat. Crust. New Zealand, 1876, p. 55.

¹³ Chilton and Bennett.—Trans. New Zealand Institute, lix, 1928 (1929), p. 775.

that the decapod genus had no alternative name, he proposed *Macneillena* for it. Unfortunately it was afterwards discovered that Rathbun had in 1897 given the name *Zalasius* to *Trichia* de Haan, on the ground of the latter's preoccupation by the coleopteran genus *Trichius* Fabricius. Although under other circumstances *Zalasius* Rathbun would be considered by us untenable,¹⁴ the name now becomes definitely valid, and we regretfully relegate *Macneillena* to its synonymy.

Affinities.—In 1927 (see ref. *infra*) Hale placed this genus among the Parthenopidæ. No explanation was then offered, but in a letter to one of us the author stated that after an examination of the specimen of *Trichia* forwarded to him (see *infra*) he could not imagine the genus to be a true Brachyrhynch as supposed by Borradaile.¹⁵ In his opinion the genus is an Oxyrhynch belonging to the sub-family *Parthenopinæ*, and the characters agree with those given for the Parthenopidæ by Borradaile (*loc. cit.*). A comparison of *Trichia* with such a genus as *Thryolambrus* shows many affinities, despite the fact that they are very different in form.

ZALASIUS DROMIÆFORMIS (de Haan).

(Plate lix, figs. 5-7.)

Trichia dromiæformis de Haan, in Siebold's Fauna Japonica, Crust. v, 1841, p. 110, pl. xxix, fig. 4 (male and female). *Idem*, Balss, Archiv für Naturg., 88 Jahrg., Abt. A., 11 Heft, 1922, p. 100 (references). *Idem*, Hale, Crust. S. Austr., pt. i, in Handbooks Flora and Fauna S. Austr., 1927, p. 143.

Trichia australis Baker, *Trans. Roy. Soc. S. Austr.*, xxx, 1906, p. 115, pl. iii, figs. 1-1b.

Trichia dromiæformis, var. *australis* Hale, *tom. cit.*, 1927, p. 142, fig. 145 (= photo. Baker's holotype).

Three specimens in the Australian Museum are identified as this apparently rare species, which was originally described from Japanese waters, and, apparently, has since been recognized only from Timor and Australia. The examples agree well with de Haan's description and figures, except for the presence of two well developed granular lobes protruding backwards from the first abdominal segment, which appear to have been damaged and are missing in the specimen figured by de Haan, or their absence is attributable to the more juvenile state of that author's original.

¹⁴ Although *Trichia* and *Trichius* have the same derivation, they are different names on the basis that a name is only a name and must be regarded as such. Further, it would be an interminable task to make all names comply with this rule.

It is worthy of note that Rathbun (*loc. cit.*) similarly changed the xanthid genus *Trapezia* to *Grapsillus* on account of the molluscan name *Trapezium*, but has since reverted to the use of *Trapezia*.

¹⁵ Borradaile.—*Ann. Mag. Nat. Hist.* (7), xix, 1907, p. 481.

This feature is shown in the illustration of a denuded male of the Australian Museum series appearing in this paper.

Material.—One female (carapace 49 mm. wide) and one male (carapace 42 mm. wide) from Queen's Beach, Port Denison, Queensland; one female (carapace 45 mm. wide) from Bowen Harbour, Port Denison, Queensland. These specimens were collected in 1922 and 1925 by Mr. E. H. Rainford of Bowen, Queensland, who has done much valuable work in the field for the Trustees of the Australian Museum. Data as to their actual occurrence are wanting, but it is certain that they were collected between tide marks on the shore.

A fourth male specimen of the above series was forwarded to H. M. Hale of the South Australian Museum, and caused him to establish a new record for *T. dromiæformis* in the remark: "has been taken in Japan and Queensland" (*loc. cit.*, 1927). This brief statement contains the first record of *T. dromiæformis* outside of its type locality.

Synonymy.—Upon careful comparison of the male holotype of Baker's *T. australis* with the Queensland specimen of *T. dromiæformis* in the South Australian Museum and de Haan's description and figures, Hale informs us (*in lit.*) that Baker's species is only a variety of *T. dromiæformis*. *T. australis* is 18 mm. long (*vide* Baker), being only about 7 mm. less than the length (1 inch, *vide* de Haan) stated for *T. dromiæformis* by its author. This fact supports Hale's observations on the differences between the two forms. In reference to the absence of tomentum on the southern form, Hale has informed one of us (*in lit.*) that "Baker said his *Trichia australis* had no hairy clothing, but here and there on his type are the basal parts of broken off hairs amongst the granules, while tucked away where the legs rest against the body a few long hairs still remain." Following on this statement came further news from Hale of the acquisition in 1929 of a second specimen (female) of *T. australis*, collected at the type locality, Port Willunga, South Australia, by W. J. Kimber. The specimen, we learn, resembles Baker's male holotype, but has more hair in the grooves of the carapace and on the outsides of the chelipeds. Nevertheless, the hairy clothing is stated to be not nearly so pronounced as in typical *T. dromiæformis*. The finding of a second specimen of *T. australis* has not shaken Hale's belief that the southern form is only a variety of *T. dromiæformis*, just as the southern Australian Hymenosomid, *Elamena (Trigonoplax) unguiformis* (de Haan), var. *longirostris* McCull¹⁶ is a variety of its typical form, which, like *T. dromiæformis*, occurs in Japan.

The illustration of *T. dromiæformis* var. *australis* appearing in this paper is from a duplicate photograph of the holotype sent us

¹⁶ McCulloch.—Rec. Austr. Mus., vii, 1, 1908, p. 59, pl. xii, fig. 3.

by Hale, and is a replica of the one reproduced in his "Handbook" (*loc. cit.*, 1927).

Family CANCRIDÆ.

Genus CANCER *Linnaeus*.

CANCER NOVÆ-ZEALANDIÆ (*Jacquinet and Lucas*).

(Plate lxi, figs. 3-7.)

Platycarcinus novæ-zealandiæ Jacquinet and Lucas, Voy. au Pole Sud., iii, Crust., 1853, p. 34, pl. iii, fig. 6.

Cancer novæ-zealandiæ Chilton and Bennett, Trans. N. Zeal. Instit., lix, 1928 (1929), pp. 735, 744 (references and synonymy).

Up to the present this species has been considered an endemic New Zealand form. Its recent discovery in abundance in Tasmanian waters must therefore come as a surprise to many workers.

In the Australian Museum there are several examples from the Derwent River estuary, in the vicinity of Hobart. These agree perfectly with the descriptions and figures of the species, and with other New Zealand specimens of *Cancer novæ-zealandiæ* also in the collection.

Material.—Tasmanian series: Five males and one female, with carapaces ranging from 53 mm. to 112 mm. in width. Also three carapaces of individuals of medium size. New Zealand series: Four males and three females, with carapaces ranging from 28 to 91 mm. in width. Six of these examples were collected by the late Charles Hedley in December, 1918; four from under stones on the beach at Portobello, Port Chalmers, and two from the shore in Blueskin Bay, near Port Chalmers; the remaining female specimen of the series is from the general locality "New Zealand," and was collected by the late R. Helms.

In the collection of the National Museum, Melbourne, Victoria, Mr. M. Ward has recently noticed several specimens of the species labelled Mentone, a locality in Port Phillip. This record is a further extension of the remarkable range of the species.

Occurrence.—The Tasmanian specimens were all collected in the vicinity of the shipping wharves at Hobart, where the species is surprisingly common. Several examples were secured by Mr. Ward in a baited, circular, shallow net which was lowered to a depth of forty feet. Individuals were observed by the same collector moving about on the bottom in the shallow water at the same place. The other complete specimen and the three carapaces of the Tasmanian series were collected by Mr. C. Lord, Director of the Tasmanian Museum, at the same locality.

Mr. T. Iredale, conchologist at the Australian Museum, suggests that the species has become established in Tasmania as the result of the introduction of New Zealand oysters, which were introduced about fifty years ago, and are now firmly established.

Variation.—The greatest variation is to be observed in a juvenile female, in which the carapace (28 mm. wide) is markedly granular, particularly on the gastric and adjacent regions, but with the granules becoming obsolete near the frontal, lateral, and posterior margins. The regions are defined by smooth, shallow channels, and the characteristic grooves between the frontal lobes are deep, conspicuous, and continued backwards to the anterior margins of the gastric regions. Other specimens of the series before us have the carapace almost smooth, or with the regions appearing in varying degrees of prominence as ill-defined nodular swellings, irrespective of age or sex. In the same way the frontal grooves may be either clearly defined or indistinct. The photographs of the species submitted in this paper serve to illustrate features of the variation described above.

Family PORTUNIDÆ.

Genus LISSOCARCINUS *Adams and White.*

LISSOCARCINUS POLYBIOIDES *Adams and White.*

(Plate lix, fig. 4.)

Lissocarcinus polybioides Adams and White, Zool. H.M.S. "Samarang," Crust. pt. ii, 1849, p. 46, pl. xi, fig. 5. *Idem*, Haswell, Cat. Austr. Crust., 1882, p. 83. *Idem*, Miers, Zool. H.M.S. "Alert," 1884, p. 541. *Idem*, Whitelegge, Journ. Roy. Soc. N. S. Wales, 1889, p. 228. *Idem*, Alcock, Journ. Asiat. Soc. Bengal, n.s., lxxviii, pt. ii, no. 1, 1899, p. 19 (with references). *Idem*, Borradaile, Fauna Maldive and Laccadive Archip., I, 2, 1902, p. 200. *Idem*, Balss, Archiv für Naturg., 88 Jahrg., Abt. A., 11 Heft, 1922, p. 102 (with references). *Idem*, Hale, Crust. S. Austr., pt. i, in Handbooks Flora and Fauna S. Austr., 1927, p. 146.

The original source of this species was vaguely given by Adams and White in 1848 as "Eastern Seas," and it was not until 1884 that Miers thoughtfully published the information that the type specimens in the British Museum came from Borneo. Meantime Haswell (1882) had recognized the form from Port Jackson, New South Wales, and this record was the first to be published with a specific locality appended. Haswell's specimens are still in the Australian Museum. Whitelegge later recorded *L. polybioides* from Port Jackson, but he obviously followed Haswell, and had access to that author's material in order to verify the original determination.

Latterly some doubt was felt in the Australian Museum as to the validity of Haswell's Port Jackson locality for *L. polybioides*, although it was supported by Mier's South Australian "Challenger" record of 1886 (see Alcock *loc. cit.*). Quite recently, however, a further specimen of the species has come to hand which confirms Haswell's record of forty-seven years ago and adds another to the tropicopolitan decapods which so curiously establish themselves in this outpost of their range. Further examples of the species are recorded below from Queensland, and constitute an addition to the fauna of that State.

The references to the species appearing above are intended to be as full as possible, and should cover every record that has appeared in literature. No previous effort of this nature has yet been attempted.

Material.—Two males and two females (carapaces 2 to 5 mm. wide) from Port Jackson, N. S. Wales (Haswell's original series). One female (carapace 14 mm. wide) from Port Jackson, N.S.W.; dredged in April, 1929, from 6 fathoms, vicinity Sow and Pigs Shoal, Sand Dredge S.S. "Triton"; coll. Capt. L. Comtesse. One adult male from Port Molle, Queensland (carapace 19 mm. wide); old collection. Two males and two females (carapaces 12 to 20 mm. wide) from Port Denison, Queensland, and vicinity. One of these was taken from the branches of a clump of live coral drawn from a depth of 15 feet. Coll. E. H. Rainford, Bowen, Queensland, in 1918, 1922, and 1923.

The excellent figure by Adams and White is apparently the only one published, and we, therefore, feel justified in depicting in this paper the recently acquired Port Jackson specimen.

Colour.—The freshly preserved Port Jackson specimen is coloured a light brownish red on the carapace; ambulatory limbs with brownish and white bands; chelipeds brownish above, with two bands of brownish red on the otherwise white movable fingers.

Distribution.—Indo-Malaysian region, China seas, and east and south-east coasts of Australia.

Genus LIOCARCINUS Stimpson.

LIOCARCINUS CORRUGATUS (*Pennant*).

Cancer corrugatus Pennant, Brit. Zool., iv, 1777, p. 5, pl. v, fig. 9.

Portunus corrugatus Miers, "Challenger" Zool., xvii, 1886, Brachyura, p. 200 (refs. and syn.). *Idem*, Ortmann, Zool. Jahrb., Syst., vii, 1893, p. 70 (refs. and syn.). *Idem*, Fulton and Grant, Proc. Roy. Soc. Victoria, n.s., xix, 1906, p. 18 (record only). *Idem*, Chilton and Bennett, Trans. N. Zeal. Inst., lix, 1928 (1929), p. 753 (refs.).

Liocarcinus strigilis Rathbun, Proc. U.S. Nat. Mus., xxvi, No. 1307, 1902, p. 25; and in Stimpson, Smith, Misc. Colls., xlix, No. 1717, 1907, p. 74, pl. ix, fig. 6 (posthumous).

Portunus corrugatus strigilis Balss, Archiv für Naturg., 88 Jahrg., Abt. A, 11 Heft, 1922, p. 101 (refs. and syn.).

Liocarcinus corrugatus Hale, Trans. Roy. Soc. S. Austr., li, 1927, p. 311 (record only); and Crust. S. Austr., pt. i, in Handbooks Flora and Fauna S. Austr., 1927, p. 148, fig. 149.

Although this cosmopolitan species has been recognized from South Australian waters (*vide* Hale), it has not previously been recorded from the New South Wales coast. The three specimens recently acquired by the Australian Museum, although juvenile, are clearly referable to this well characterized form.

Material.—One male (carapace 8 mm. wide) from off Botany Bay to Wata Mooli, N. S. Wales, 50 fathoms. Collected by Mr. M. Ward from the deck of the trawler "Thistle." One male and one female (carapaces respectively 11 mm. and 9.5 mm. wide) from off Green Cape, N. S. Wales, 40 fathoms. Collected by trawler Capt. K. Möller, July, 1926.

Also in the Australian Museum collection are several adults of both sexes from Mevagissey, English coast (three specimens), Mediterranean Sea (three specimens) and Bay of Naples, Italy (two specimens).

The largest specimen of the series is a male measuring 44 mm. between the tips of the last pair of lateral spines.

Mr. H. M. Hale, Curator of the South Australian Museum, has forwarded some notes on his series of four specimens from South Australian waters. He says "the median tooth of the front is obtuse in only the smallest; the other three specimens have a right-angled rostrum. The length of the carapace is 0.80, 0.86, 0.87 and 0.83 of the width in these examples—a big range in a small series. Width of carapace of the four specimens in the same order is 24.9, 21, 10 and 15 mm."

In our three much smaller specimens from New South Wales the median rostral tooth is moderately obtuse, but this condition is considered to be due only to extreme youth. The length of the carapace, however (taking the specimens in order of size), is 1.06, 1.18 and 1.15 of the width.

In consideration of these facts both Mr. Hale and the writers of this paper are inclined to follow the synonymy quoted by Miers (*loc. cit.*).

In order to assist workers in the study of this perplexing species, as full a list of references as possible has been compiled.

Family XANTHIDÆ.

Genus ERIPHIA Latreille.

ERIPHIA NORFOLCENSIS Grant and McCulloch.

Eriphia norfolcensis Grant and McCulloch, Proc. Linn. Soc. N. S. Wales, xxxii, 1, 1907, p. 151, pl. i, figs. 1-1b.

The above species has not previously been recorded from other than its type locality—Norfolk Island, South Pacific Ocean. An interesting addition to the range is provided by three specimens from the coast of New South Wales, which agree perfectly with the three type examples in the Australian Museum.

Material.—One ovigerous female (carapace 15 mm. wide), one male (carapace 11 mm. wide), one female (carapace 11 mm. wide), from Shellharbour, New South Wales; occurring under stones in rock crevices and elsewhere between tide marks; collected by G. McAndrew, late 1923 and early 1925.

A series of nineteen specimens is also in the Australian Museum from Lord Howe Island, approximately half-way between the type locality and the source of the above record. Apparently the species is equally common on the two islands mentioned.

ERIPHIA SEBANA (Shaw).

(Plate lix, figs. 1-2.)

Cancer sebanus Shaw, in Shaw and Nodder, Nat. Misc., xv, 1803, pl. 591.

Eriphia sebana Rathbun, Bull. U.S. Fish. Comm., xxiii, pt. 3, for 1903 (1906), p. 865 (and synonymy). *Idem*, McNeill, Austr. Zoologist, iv, pt. 5, 1926, p. 309 (and synonymy). *Idem*, Ward, Austr. Zoologist, v, pt. 3, 1928, pp. 243, 244, fig. on pl. 27.

This well known and typical species of the conglomerate reef zones of Queensland's pseudo-atolls has not been recognized hitherto further south than the islands of the Capricorn Group. The present records are therefore somewhat striking in that they provide another instance of the vagaries of distribution and acclimatization.

Material.—Two male specimens (carapaces 46 and 55 mm. wide) from coast near the mouth of Richmond River, New South Wales; among rocks between tide marks; coll. A. W. O'Sullivan, who states that the species is not uncommon at the locality.

One young male specimen (carapace 22 mm. wide) from surface of rocky reef flat exposed at low tide on coast in vicinity of the breakwater at Newcastle, New South Wales; coll. Melbourne Ward, 1924.

The example from Newcastle is referable to the variety *smithii* Macleay, which is clearly defined by Alcock¹⁷ under the name *Eriphia laevimana* var. *smithii*. Apparently there is no previous record of the variety *smithii* from Australian waters.

Genus ATERGATIS *de Haan.*

ATERGATIS OCYROE (*Herbst*).

Cancer ocyroe Herbst, *Naturg. d. Krabben u. Krebse*, iii, 2, 1801, p. 20, pl. liv, fig. 2. *Idem*, McNeill, *Austr. Zoologist*, iv, 5, 1926, p. 312 (references and synonymy). *Idem*, Ward, *tom. cit.*, v, 3, 1928, p. 244.

Although this species is known from a vast Indo-Pacific area, and is perhaps the commonest reef crab of the Queensland coasts, it has not previously been recognized further south than the islands of the Capricorn Group (McNeill, *loc. cit.*). Apparently the species is now establishing itself much further to the southward. Quite recently specimens from widely separated localities on the New South Wales coast have been acquired by the Australian Museum, and it is interesting to note that keen collectors in the past failed to meet with such a conspicuous form.

Material.—Sixteen examples from localities on the coast of New South Wales, with carapaces ranging from 6.5 mm. to 49 mm. in width: one male from coast near mouth of Richmond River, coll. A. O'Sullivan, 1924; one male from coast at Newcastle, coll. M. Ward, July, 1924; one immature juvenile from Watson's Bay, Port Jackson, coll. W. Barnes, 8th July, 1922; one male and one female from Cabbage Tree Bay (Shelly Beach), Manly, on coast north of Port Jackson, coll. M. Ward, 1924; three males and three females from Long Reef, Collaroy, on coast north of Port Jackson, coll. M. Ward, 1924; one male and three females, and one immature juvenile from Shellharbour, coll. G. McAndrew, 1923 and 1924.

Besides the above there are numerous specimens in the Australian Museum from the eastern Queensland coast, Gulf of Carpentaria, North Australia, Torres Strait, New Guinea, British Solomons, Lord Howe Island, Fiji, Japan, New Hebrides, and Ellice Islands.

Habits and Occurrence.—On the reefs of the Queensland coast the species is found sheltering under loose dead coral fragments between tide marks, and commonly wanders about in the open in areas where shallow stretches of water are left by the receding tide. The latter habit has not been observed in specimens collected on the New South Wales coast, but the crabs hide under stones high up

¹⁷ Alcock.—*Journ. Asiat. Soc. Bengal*, n.s., lxxvii, pt. ii, No. 1, 1898, p. 216.

in the tidal zone, where a little water remains covering patches of shell grit and sand, which are warmed by the sun after the tide recedes.

Genus CHLORODIELLA *Rathbun.*

CHLORODIELLA NIGER (*Forskål*).

Chlorodius niger Haswell, Cat. Austr. Crust., 1882, p. 62. *Idem*, Whitelegge, Journ. Roy. Soc. N. S. Wales, 1889, p. 227. *Idem*, Alcock, Journ. Asiat. Soc. Bengal, n.s., lxxvii, pt. ii, no. 1, 1898, p. 160 (full refs. and syn.).

In 1882 Haswell recorded a specimen of this common tropical species from Port Jackson, New South Wales, which is still in the collection of the Australian Museum. Whitelegge later (1889) listed the species from the same locality on the authority of Haswell's record and that author's specimen. No further examples have been reported in the interim from a locality so far south, but the recent capture of further New South Wales specimens removes any doubt as to the validity of Haswell's record. The scarcity of New South Wales examples suggests that the species is only an occasional visitor to these shores, and is perhaps carried by currents from Norfolk and Lord Howe Islands, where it is firmly established.

Material.—One male from Port Jackson, N. S. Wales (carapace 16 mm. wide), Haswell's original specimen; three females from Shellharbour, on New South Wales coast south of Port Jackson (carapaces 8.5 to 12 mm. wide). Collected on rocky shore between tide marks by G. McAndrew in 1923 and 1925.

Besides numerous specimens in the Australian Museum from the tropical Australian coastline and other tropical Pacific localities, there are twenty-four examples of both sexes from Lord Howe Island in the south Pacific Ocean.

EXPLANATION OF PLATE LIX.

Eriphia sebana, var. *smithii* Macleay.

Fig. 1.—Young male from coast at Newcastle, New South Wales.
Carapace 22 mm. wide.

Fig. 2.—Ventral view of same, to show sculpture of chelipeds.

Polyonyx transversus (Haswell).

Fig. 3.—Male example from Botany Bay, New South Wales.
Carapace 11 mm. wide.

Lissocarcinus polybioides Adams and White.

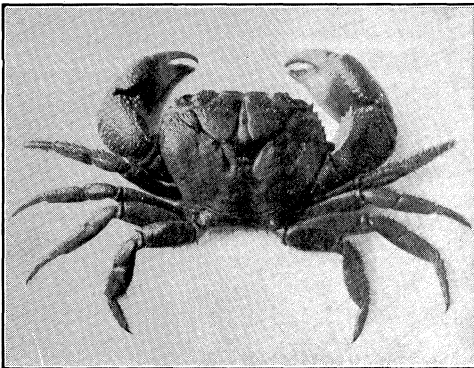
Fig. 4.—Female example from Port Jackson, New South Wales;
dredged in 6 fathoms. Carapace 14 mm. wide.

Zalasia dromiceiformis (de Haan).

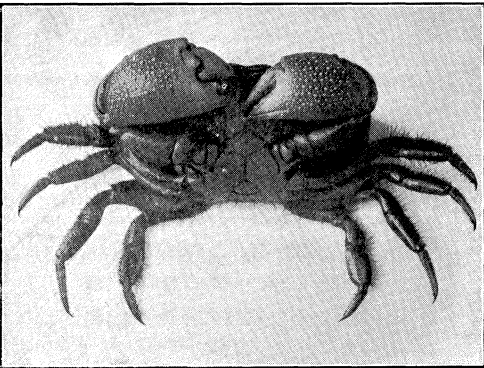
Fig. 5.—Male holotype of *Z. dromiceiformis*, var. *australis* Baker.
Length 18 mm. (*vide* Baker).

Fig. 6.—Female example, carapace 49 mm. wide, from Queen's
Beach, Port Denison, Queensland.

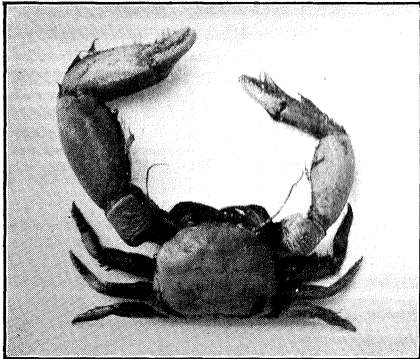
Fig. 7.—Male example (denuded), carapace 42 mm. wide, from
same locality.



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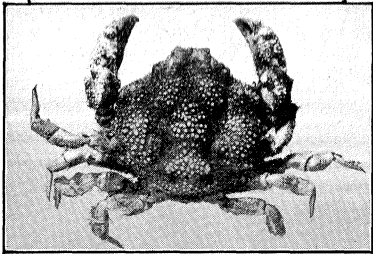
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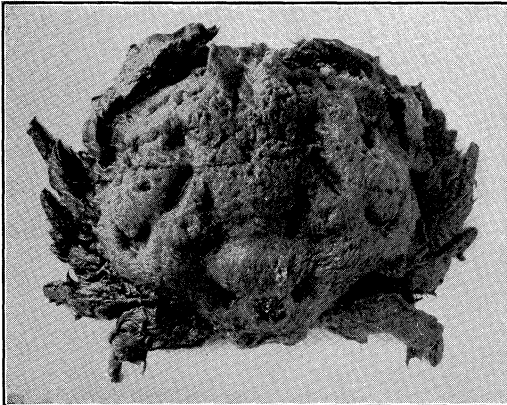
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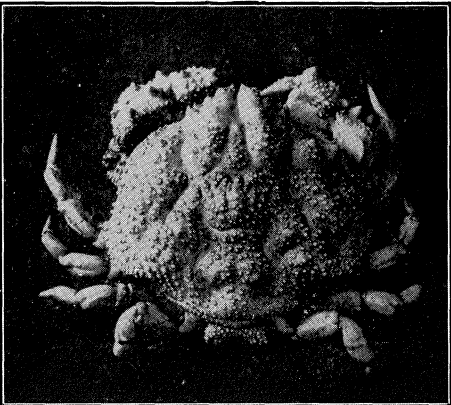
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EXPLANATION OF PLATE LX.

Heterolithadia fallax (Henderson).

Fig. 1.—Male specimen from 11 fathoms, near Michaelmas Reef cay, Great Barrier Reef, off Cairns, Queensland. Carapace 12 mm. wide.

Fig. 2.—Ventral view of same, to show abdomen and sternum.

Ebalia (Phlyxia) ramsayi Haswell.

Fig. 3.—Female holotype from Port Jackson, New South Wales. Carapace 9 mm. wide.

Fig. 4.—Ventral view of female example from Kurnell, Botany Bay, New South Wales. Carapace 8 mm. wide.

Philyra platycheira de Haan.

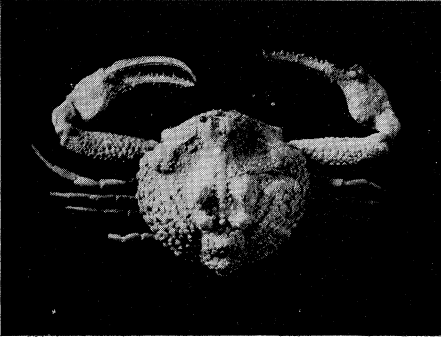
Fig. 5.—Dorsal view of male carapace from Port Jackson, New South Wales; dredged in 6 fathoms. Carapace 11 mm. wide.

Fig. 6.—Ventral view of same.

Leucosides hæmatosticta (Adams and White).

Fig. 7.—Male specimen from Port Jackson, New South Wales; 2-3 fathoms (M. Ward collection).

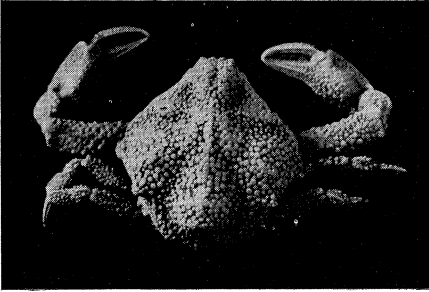
Fig. 8.—Ventral view of same.



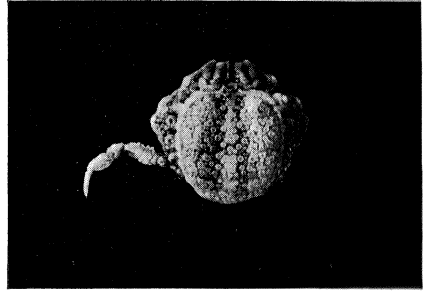
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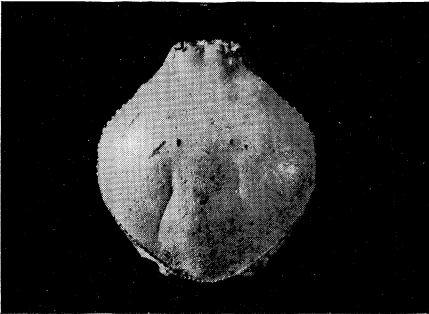
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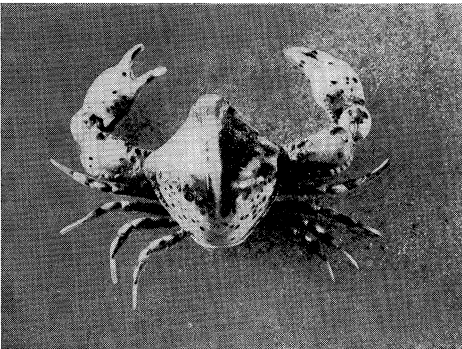
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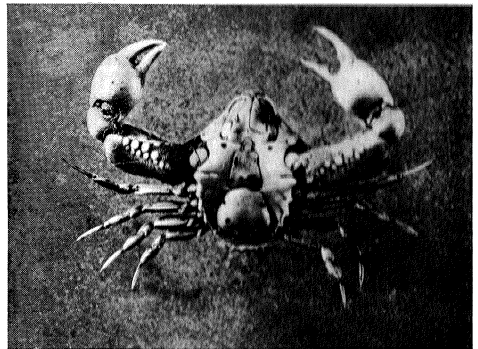
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EXPLANATION OF PLATE LXI.

Ebaliopsis erosa (A. Milne Edwards).

Fig. 1.—Female specimen from 11 fathoms, near Michaelmas Reef cay, Great Barrier Reef, off Cairns, Queensland. Carapace 10 mm. wide.

Fig. 2.—Ventral view of same.

Cancer novæ-zealandiæ (Jacquinot and Lucas).

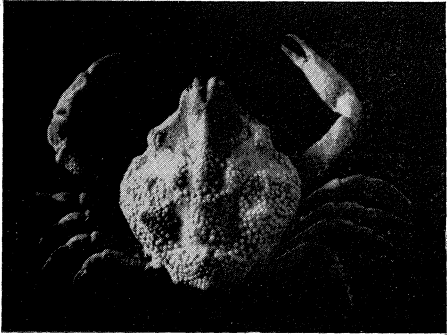
Fig. 3.—Juvenile female specimen from Portobello, Port Chalmers, New Zealand. Carapace 28 mm. wide.

Fig. 4.—Juvenile male specimen from same locality. Carapace 30 mm. wide.

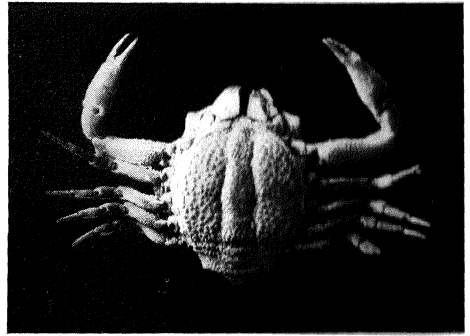
Fig. 5.—Juvenile male specimen from same locality. Carapace 39 mm. wide.

Fig. 6.—Young male specimen from Blueskin Bay, near Port Chalmers, New Zealand. Carapace 52 mm. wide.

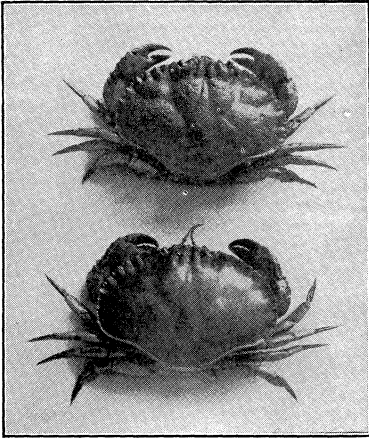
Fig. 7.—Adult male specimen from Derwent River, Hobart, Tasmania. Carapace 108 mm. wide.



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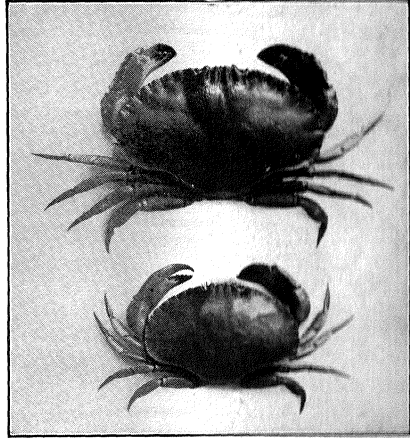


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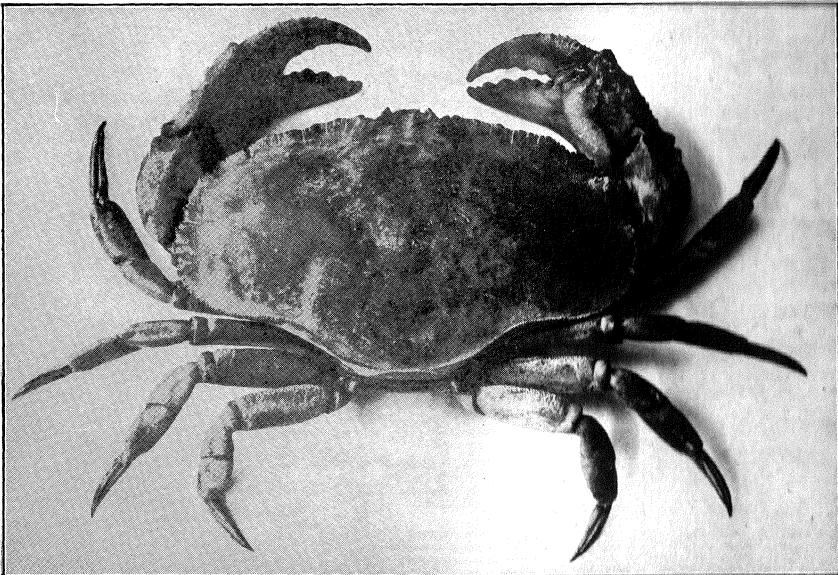
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