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The Grapsid and Ocypodid Crabs of Tasmania

By

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During a visit to Tasmania lasting from December, 1940, to April, 1941, I made a small collection of shore crabs, chiefly from the neighbourhood of Hobart, which included all but two of the species recorded from the island of the families indicated in the title (1).

Access to the collections and library at the Australian Museum, Sydney, and working facilities very kindly granted by the Director, Dr. A. B. Walkom, have enabled me to prepare this paper. My thanks are also due to Dr. J. Pearson for the loan of collecting materials and for permission to use the Royal Society's library at Hobart.

No new or rare species are recorded, and the paper is intended rather to assist identification of the Tasmanian species of these families of crabs than as a contribution to systematic carcinology. Those unfamiliar with the morphological terms used will find a clear and complete account of them in Hale, 1927 a.

The drawings are traced from photographs, and in some the carapace is slightly foreshortened; no attempt has been made to reproduce the colours or markings.

Family GRAPSIDAE

Typically the crabs of this family have the carapace flattened and more or less quadrate. The front is broad, and the orbits are at or near the antero-lateral angles, the eye-stalks being short and thick. There is always a distinct gap between the external maxillipeds.

Most of the Grapsids inhabit the seashore and the margins and flats of tidal rivers, some species running actively over the rocks, others living in burrows or under stones and driftwood. Some are more or less predatory, but they exist chiefly by scavenging.

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(1) The Soldier Crab, *Mictyris platycheles*, is excluded from this account as the genus, formerly classified with the Ocypodidae, is now regarded as constituting a separate family. A very complete account of the species of the genus is given by McNeill (1926).

KEY TO THE SUBFAMILIES.

1. The first antennae fold beneath the front in the usual manner, and are not then visible from above 2
   The first antennae are placed in deep clefts in the front, and are visible in dorsal view ..... PLAGUSIINAE
2. No oblique hairy ridge on the outer surface of the external maxillipeds 3
   An oblique hairy ridge on the outer surface of the external maxillipeds ..... SESARMINAE
3. The lower margin of the orbit runs down to the corner of the buccal frame; the inner margin of the merus of the chelipeds is expanded distally into a toothed, laminar process ..... GRAPSINAE
   The lower margin of the orbit does not run down to the corner of the buccal frame; the merus of the cheliped is not thus expanded ..... VARUNINAE

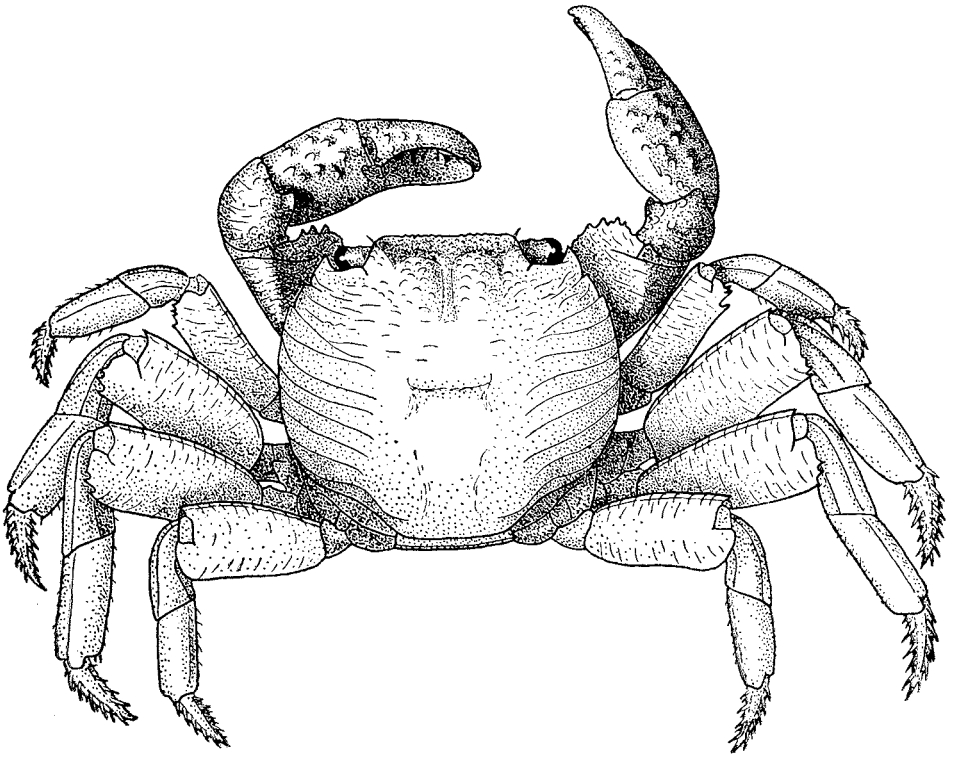

FIG. 1.—*Leptograpsus variegatus*, ♂

Subfamily GRAPSINAE

Tasmania is situated within the known range of one species.

Leptograpsus variegatus (Fabr.). Fig. 1

Hale, 1927, p. 180.
Montgomery, 1931, p. 451.
Balss, 1935, p. 142.

Material. I collected none myself, but was able to examine a good series in the collection of the Australian Museum.

Description. The carapace is flattened and subquadrate in shape, with the lateral margins curved and carrying two teeth behind the outer orbital angle, the hinder of which may be small and is occasionally absent. The front is broad

and prominent, and its upper surface is coarsely granular. The epigastric region, behind the front, is studded with transverse tubercles. The rest of the carapace is smooth with a number of parallel, obliquely transverse, raised lines on each branchial region. The chelipeds are large in the male; with increasing age and size they become relatively more massive, and the closed fingers gape more and more widely. The inner edge of the arm is expanded to form a toothed laminar process, and there is a tooth at the inner angle of the wrist. The chelae are smooth with some tubercles on the upper part and a ridge on the lower part of the palm, which runs onto the immovable finger; the tubercles are fewer and the ridge fainter in older specimens. The meri of the walking legs are flattened and expanded, and carry an anterior subdistal spine and two or three teeth at the posterior distal margin, except in the last pair, where the teeth are at most faintly indicated. Each dactylus carries four rows of strong spines. Large specimens are as much as 70 mm. in carapace breadth.

Colour. Variable, ranging from dark grey to various shades of red and yellow; the claws are blue or purple.

Distribution. Southern Australia, ranging north as far as Rockhampton on the east coast, New Zealand, and other South Pacific islands and West Coast of South America. Specimens from Moutouard Island in the Bass Strait are in the Australian Museum collection, and the species most probably occurs in Tasmania.

Remarks. This crab is found on exposed, rocky coasts, and runs with great speed and agility over the rocks.

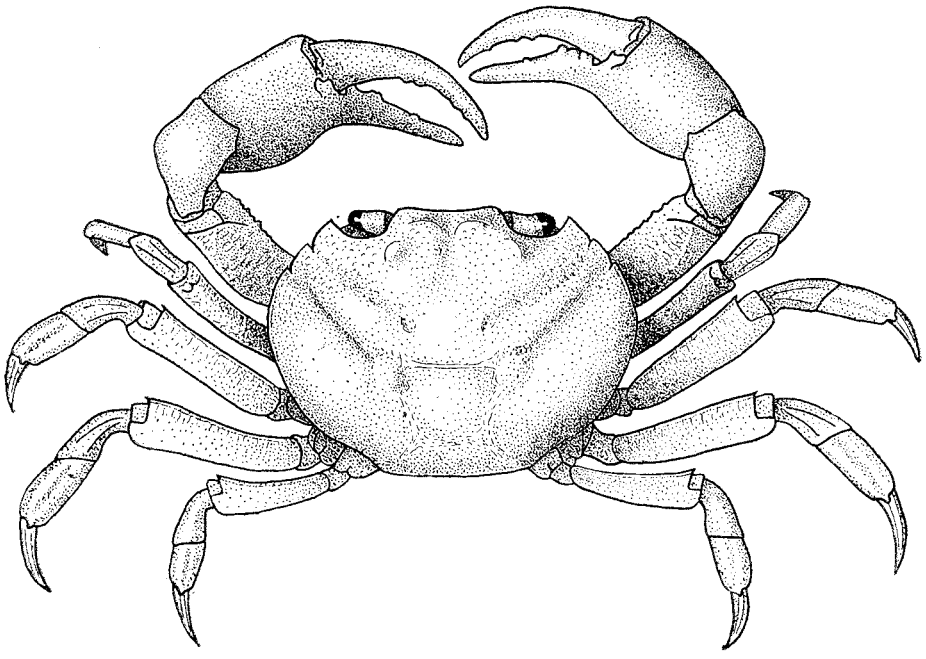

FIG. 2.—*Brachynotus octodentatus*, ♂

Subfamily VARUNINAE

Two species of one genus are found in Tasmania.

Brachynotus octodentatus (Milne Edwards). Fig. 2

Tesch, 1918, p. 106.
Hale, 1927 a, p. 182.
Montgomery, 1931, p. 452 *(Leptograpsodes webhaysi).*
Balss, 1935, p. 142.

Material. I collected none myself, but two small specimens from Hawley Beach, Devonport (2.5.38, Coll.A.L.W.), are in the collection of the Hobart Museum.

Description. This is a large species, reaching 60 mm. in carapace breadth. The carapace is flattened, but the branchial regions are convex and the post-frontal tubercles distinct. Its anterior and lateral parts are granulate in small, less so in large individuals. The lateral margins are arched, with three teeth behind the outer orbital angles, which decrease in size posteriorly, the last being small and obscure. A deep groove, representing the lateral part of the cervical groove, runs obliquely backwards on each side of the carapace from a point near the second of these teeth. The edge of the front is faintly emarginate. In the female the chelipeds are small and the fingers slender and scarcely gaping when closed. In the male they become larger and increasingly robust with age, the arms (meri) projecting far beyond the edge of the carapace; at the same time the immovable fingers become more strongly bent downwards at an angle from the palm and the dactyli more curved, so that in large males the fingers gape widely when closed. The chelae are smooth, with a few scattered granules on the inner surface in males. The fingers are irregularly dentate along their biting edges, one tooth near the base of the immovable finger being larger than the rest and often itself denticulate.

Colour. Olivaceous mottled or spotted with dark brown.

Distribution. Tasmania and the southern half of Australia. Haswell's record from the north coast of Tasmania is incorrect (see Hale, 1927 b. p. 313), but the Hobart Museum specimens re-establish it in the fauna of the Island. It occurs also on King Island.

Remarks. I agree with Balss that the characters described by Montgomery for *Leptograpsodes webhaysi* are not sufficient to distinguish it from the present species.

B. octodentatus occurs on rocky coasts in rock crevices, under stones, etc. The old males are found living singly in burrows.

Brachynotus spinosus (Milne Edwards). Fig. 3

Hale, 1927 a, p. 184; 1927 b, p. 312 *(Eriocheir spinosus).*

Material. Specimens from the shore at Brown's River, near Hobart, and from the estuary of the Carlton River.

Description. A small species, not often exceeding 20 mm. in carapace breadth. The carapace is flattened, and its surface is uneven, the regional boundaries, especially the cervical groove, being well defined. There are three teeth on the lateral margins, behind each outer orbital angle, which usually diminish in size posteriorly, but the second may be the smallest. The greatest breadth of the carapace is at the level of the hindmost of these teeth. Its surface is finely granular anteriorly and smooth elsewhere. A raised line runs back from the posterior lateral tooth to a point over the base of the last leg, cutting off a distinct posterior branchial facet. The front is broad and emarginate in the middle. The corneae of the eyes are peculiar in being black spotted with white. The

male chelipeds are not much enlarged. They are quite smooth, and the fingers scarcely gape when closed. In the basal part of the cleft of the fingers of each chela there is a patch of short, matted hairs. The chelae of the female are more slender and lack this patch of hair. The walking legs are somewhat flattened, and there is an anterior sub-distal spine on the merus of each. In the male there is a tuft of short fur on the distal half of the hinder edge of the propodus of the first and second legs, which is absent in the female or at most faintly indicated on the first leg only. My largest specimen, a female, is 21 mm. in carapace breadth.

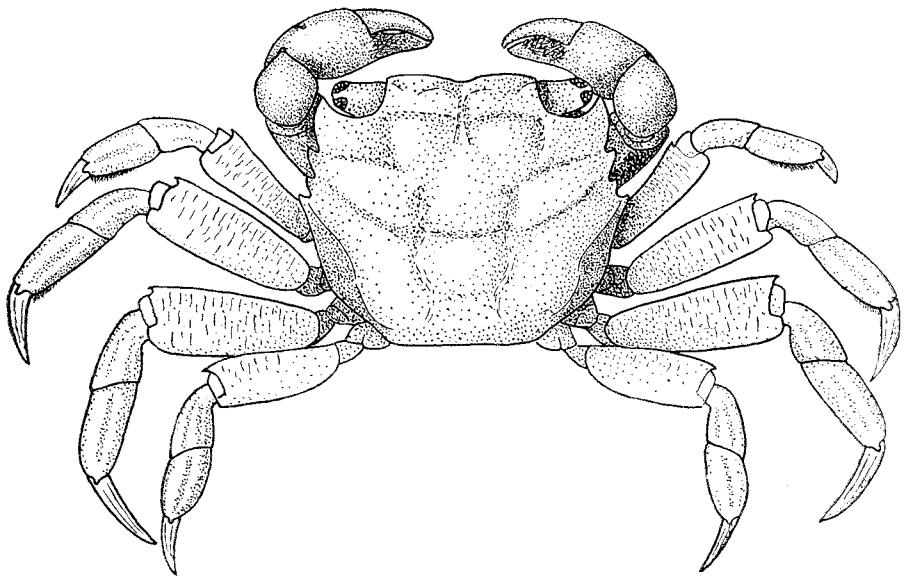

FIG. 3.—*Brachynotus spinosus*, ♂

Colour. Dull green or brown with or without white markings, which may be so extensive as largely or wholly to replace the darker colour.

Distribution. Originally described from Australia, this species appears to be confined there to the southern part of the continent and Tasmania. It would thus seem to be a cold water form, and records in the older literature from the tropical islands of Vanicoro and Upolu are rather hard to explain and, in my opinion, require confirmation.

Remarks. Hale placed this species in *Eriocheir*, a genus that includes the well-known Mitten Crab, *E. japonicus*, and is otherwise confined to north China and Japan. The front in *Eriocheir* is typically much narrower than in *B. spinosus*, and the presence of hair on the fingers of the male is characteristic of a number of Varunine genera in addition to *Eriocheir*.

The species was found commonly under stones and driftwood, especially the latter, on the sandy and muddy shores of the Carlton estuary. At Brown's River specimens were found in rock pools, and most of them were much paler in colour than those from the Carlton. Both in maximum and average size, the females collected were larger than the males.

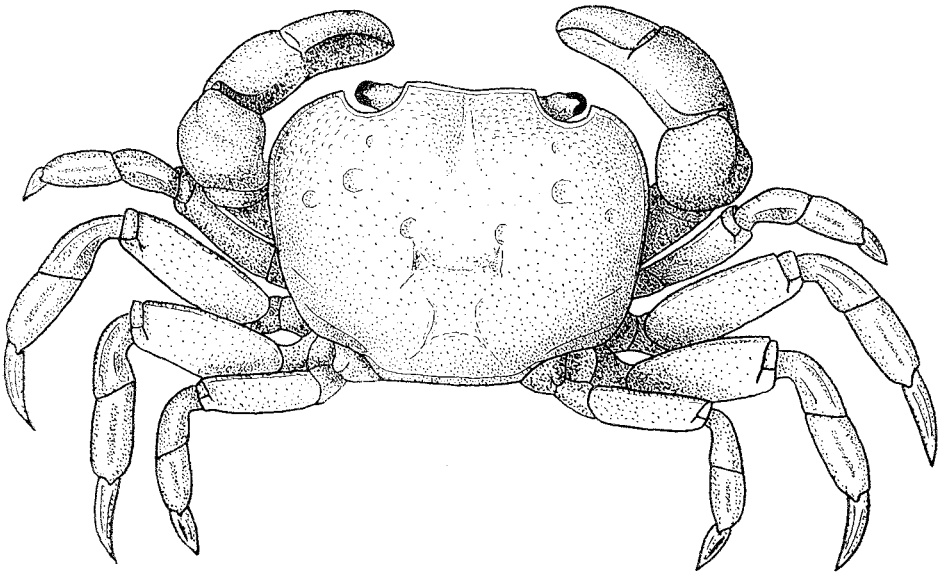

FIG. 4.—*Cyclograpsus audouinii*, ♂

Subfamily SESARMINAE

Four Tasmanian species included in three genera.

KEY TO THE GENERA (after HALE, 1927 a, p. 175).

1. Antero-lateral margins cut into teeth 2
   Antero-lateral margins not cut into teeth .... CYCLOGRAPSUS
2. Body thick and front very declivous. Last abdominal segment of female less than twice as wide as long .... HELICE
   Body more depressed with front not markedly declivous. Last abdominal segment of female at least twice as wide as long .... PARAGRAPSUS

Cyclograpsus audouinii (Milne Edwards). Fig. 4

Hale, 1927 a, p. 176.
Balss, 1935, p. 142 *(C. punctatus audouinii)*.

Material. Specimens from the shore near Brown's River.

Description. The carapace is smooth and flat with some symmetrically placed shallow pits, better developed in adults than in juveniles, and with the frontal, orbital, and hepatic regions finely granulate. The gastric, cardiac, and intestinal regions are bounded by ill-defined wrinkled depressions. The frontal, orbital, and lateral borders are raised and finely beaded, the latter quite entire. The front is broad and faintly emarginate in the middle. The chelipeds of the adult male are large, the chelae smooth externally, the inner surface bearing a granular ridge. The largest specimen collected, a male, measured 32 mm. in carapace breadth.

Colour. The anterior part of the carapace is dark purple, giving place to pale greenish posteriorly through an intermediate zone irregularly blotched with both colours. The purple may prevail almost entirely at the expense of the green, but the shallow pits are generally pale coloured. The wrists and upper margins of the chelae are purple; the rest of the palm and the fingers white.

Distribution. The whole of southern Australia, Tasmania, and New Zealand. Although it is most typically a cold water form, it has been recorded from the tropical Pacific and New Guinea.

Remarks. I found this crab only on stony beaches, quite devoid of mud and sand, below cliffs and headlands, living underneath the larger stones.

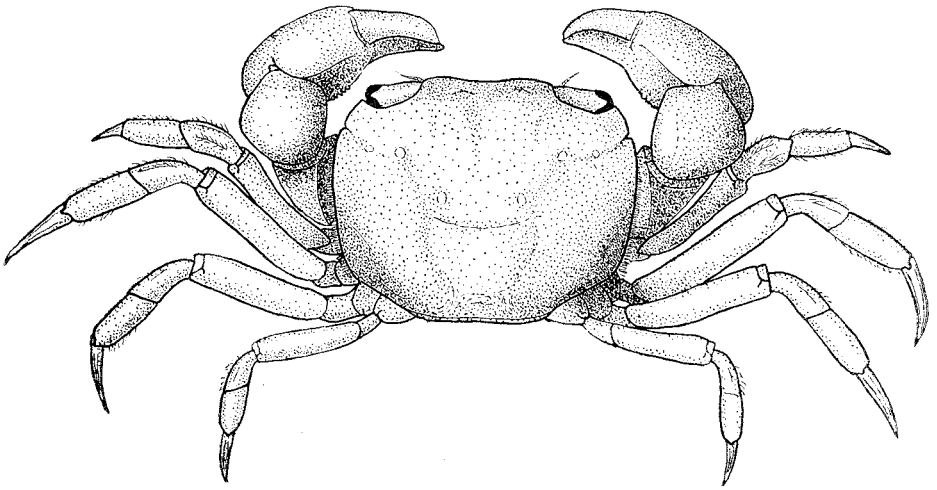

FIG. 5.—*Helice haswellianus*, ♂

Helice haswellianus (Whitelegge). Fig. 5

Haswell, 1882, p. 106 (*Chasmagnathus convexus*, nec *C. convexus* de Haan).
Whitelegge, 1890, p. 229 *(Chasmagnathus haswellianus).*
Hale, 1927 a, p. 177.

Material. Specimens from Brown's River, near Hobart, burrowing in mud in company with *Heloecius cordiformis*; these were compared with the type of "*C. convexus*" Haswell in the Australian Museum.

Description. The carapace is convex in both directions, strongly so fore and aft, the front being so steeply deflexed that its edge is scarcely visible in dorsal view. Its surface is everywhere smooth and polished, the inter-regional grooves shallow and indistinct. The lateral margins are convex with a small incision behind each outer orbital angle. Viewed from the front the frontal margin appears obscurely quadrilobate. The chelae are fairly large and quite smooth externally in the adult male, with a granular swelling on the inner surface and bordered below by a distinct ridge; those of the female are small and finely granular externally. The walking legs are slender, more so than in any of the other Tasmanian Sesarminae.

Adult specimens measure between 25 and 30 mm. in carapace breadth.

Colour. The carapace is dark olive or slate colour with some paler, slightly depressed spots and occasionally some lighter markings anteriorly. The legs, wrists and upper margins of the chelae are like the carapace, the outer surface of the chelae yellow.

Distribution. South-eastern Australia and Tasmania.

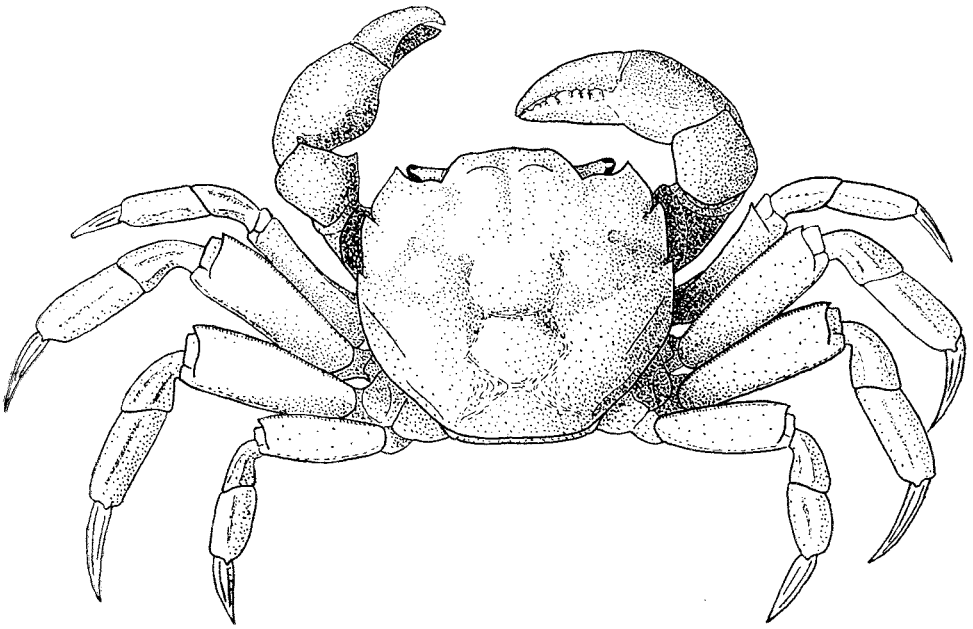

FIG. 6.—*Paragrapsus gaimardii*, ♂

Paragrapsus gaimardii (Milne Edwards). Fig. 6

Haswell, 1882, p. 105.
Tesch, 1918, p. 119 *(Helice gaimardi)*.
Hale, 1927 a, p. 179.

Material. Specimens from Brown's River and Sandy Bay, Hobart.

Description. The carapace is about as broad as long, moderately convex in both directions and everywhere finely granulate. The lateral margins carry two teeth behind the outer orbital angle. There is an oblique granular ridge on each branchial region and another shorter one over the bases of the two last pairs of legs. The front is prominent; its edge is turned up as are those of the lateral margins in front of the posterior teeth. The orbital margins are distinctly angulate where they join the frontal margin near the bases of the eye-stalks. The chelae of the male are fairly large, finely rugose externally, and granular on the inner surface. The biting edges of the fingers do not gape, and are beset with closely and evenly spaced rounded teeth. Those of the female are small with a granular ridge running along the lower part of the outer surface of the palm and onto the immovable finger. The walking legs are broad and flattened. In the adult male the suture between the first and second sternal plates on each side of the abdomen is marked by a prominent ridge.

Adult males measure 40 to 50 mm. in carapace breadth.

Colour. The carapace is greenish above, spotted with dark red; posteriorly the spots are distinct, but in front of the cervical groove the red colour becomes finely diffuse or runs together to form blotches. Light coloured depressions are usually present disposed much as in *C. audouinii*. The ground colour of the legs and chelipeds is lighter and the red spots very distinct; outwardly the chelae are yellowish and unmarked.

Distribution. Tasmania, Victoria, and South Australia.

Remarks. This is the commonest shore crab in the neighbourhood of Hobart. A large stone turned over on any foreshore where the sand contains an admixture of mud often reveals a score or more, which immediately scramble for shelter beneath the overturned stone or even under the feet of the collector; it is found also in sandy and muddy lagoons where there are no stones. This species and *Cyclograpsus audouinii* are never found together. The latter inhabits only the clean, stony beaches, while no surroundings seem to be too dirty for *P. gaimardii.*

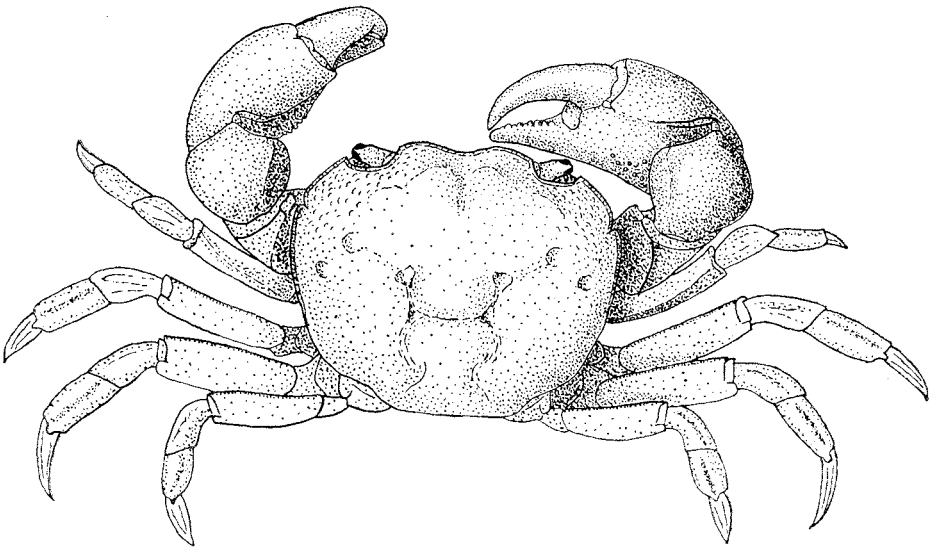

FIG. 7.—*Paragrapsus quadridentatus*, ♂

Paragrapsus quadridentatus (Milne Edwards). Fig. 7

Haswell, 1882, p. 105.
Tesch, 1918, p. 125.

Material. Specimens from Brown's River, near Hobart.

Description. The carapace is broader than long, flattened transversely, smooth, and polished except on the frontal, orbital, and hepatic regions, where it is finely granular. A number of shallow pits is disposed on the carapace as in *C. audouinii*, and the gastric, cardiac, and intestinal regions are bordered by wrinkled depressions as in that species, but rather more distinctly. The lateral margins have only one tooth behind the outer orbital angle. The edge of the front is distinctly excavated in the middle. The chelae of the male are very large and swollen, the outer surface smooth, a short row of granules on the inner surface of the palm. The fingers gape when closed and have small, unequal teeth on their biting edges; a large, fleshy protuberance fills the proximal part of the space between the gaping fingers. The female chelae are small and ridged as in *P. gaimardii.* The walking legs are fairly slender, not expanded and flattened as in that species.

Colour. The carapace is greenish grey spotted with reddish brown, the spots being much more scattered and less numerous than in *P. gaimardii.* The legs and the upper parts of the chelipeds are the same colour but not spotted, the colour fading to yellowish white on the outside of the chelae.

Distribution. Tasmania and Victoria.

Remarks. This species has many points of resemblance to *Cyclograpsus audouinii* and is probably more closely related to that species than to *P. gaimardii.* Our present somewhat artificial conception of the two genera refers it to *Paragrapsus* on account of the dentate antero-lateral borders.

In the original description the front was described as almost straight; both Haswell and Tesch (ll.c.) have copied this observation, but it is only true of juvenile specimens; in the adult the front is distinctly excavated in the middle.

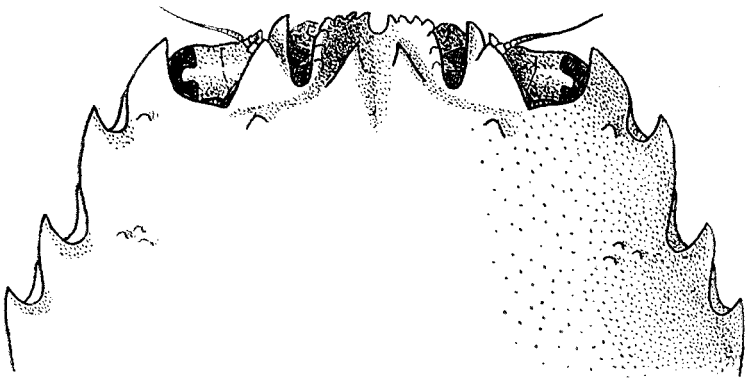

FIG. 8.—*Plagusia capensis,* anterior part of carapace.

Subfamily PLAGUSIINAE

A single Tasmanian species.

Plagusia capensis (de Haan). Fig. 8

Tesch, 1918, p. 129.
Hale, 1927 a, p. 185 *(P. chabrus).*
Balss, 1935, p. 143.

Material. Not collected, but the species is well known from Tasmania and the Hobart Museum possesses specimens.

Decription. The presence of two deep clefts in the front, in which the first antennae are visible, make this crab unmistakable. The carapace is flat and everywhere covered with short hair, and the lateral margins bear three large teeth behind the outer orbital angle. Between the clefts the front is cut into a number of sharp teeth. The chelipeds are covered with rounded tubercles, some of which are disposed in rows. The meri of the walking legs are expanded and spinate along their anterior margins and all the joints are ridged, the intervening grooves being filled with hair. The dactyli carry two rows of spines. Adult males are about 50 mm. in carapace breadth.

Distribution. This is best described as circum-subantarctic as the crab occurs on the southern shores of Australia, Africa, and South America and islands included in this zone.

Remarks. Like *Leptograpsus* this is an inhabitant of exposed rocky coasts. Its wide range is probably explained by the fact that this and other species of the genus, although normally shore dwellers, are sometimes found on drifting timber in the open sea.

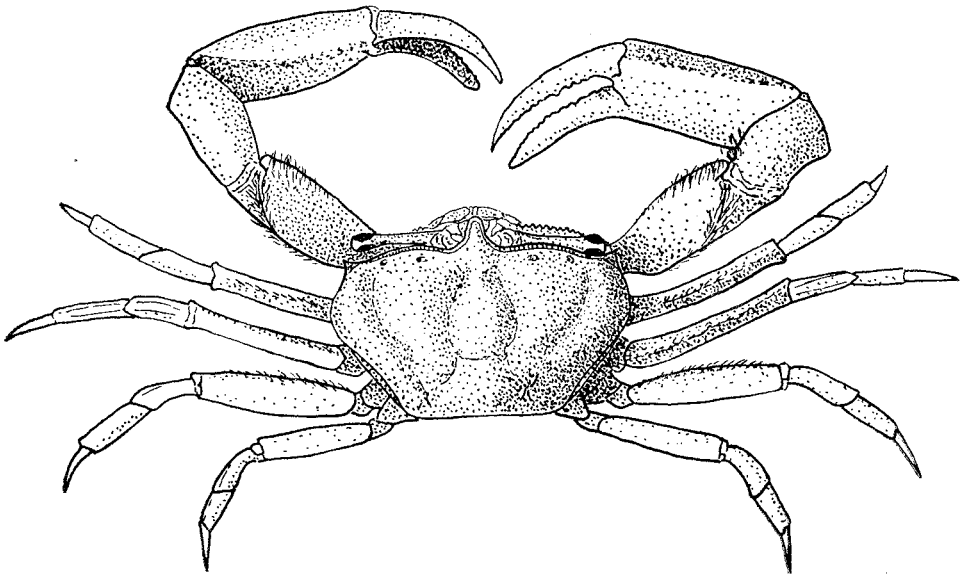

FIG. 9.—*Heloecius cordiformis*, ♂

Family OCYPODIDAE

This family is distinguished from the *Grapsidae* by the narrow front and correspondingly long orbits and eyestalks, each of which is usually at least a third of the width of the carapace. In addition the external maxillipeds do not leave a wide gap between them when closed.

Like the Grapsids the Ocypodid crabs are shore dwellers and amphibious in habits. Nearly all live in burrows in sand or mud. Most of them feed in a curious and characteristic manner. When the falling tide lays bare a stretch of mud or sand it leaves on the surface a thin film or scum of organic matter. On this the Ocypodids feed, scraping it up with their spoon-shaped fingers. The sand-dwelling forms seive the sand they put in their mouths, discarding the coarser grains in the form of little pellets, just as do the closely allied Mictyrids.

Only two Ocypodid crabs are known from Tasmania.

Heloecius cordiformis (Milne Edwards). Fig. 9

Haswell, 1882, p. 91.
Ward, 1928, p. 242.

Material. Specimens from Brown's River, near Hobart, and Orford, on the east coast.

Description. The carapace is convex, broad in front and narrow behind, with the regions well marked and the hepatic regions very prominent and inflated so that they almost overhang the small, sharp, forwardly directed outer orbital

angles. The posterior part of each branchial region is separated by a raised line from the rest of the carapace and forms a triangular facet. The front is reduced to a narrow lobe between the bases of the eye-stalks, which are very long. The chelipeds of the adult male are large and greatly elongated, the length of the hand alone being equal to the breadth of the carapace. The immovable finger is bent down at an angle to the palm, which is bordered above and below by a finely milled ridge. The fingers are spoon-shaped at the tips and dentate along their biting edges. The walking legs are smooth, the meri of the first three somewhat hairy at the anterior and posterior margins. Each of the external maxillipeds has a broad, longitudinal groove traversing the ischium and merus.

Colour. The carapace, legs, and proximal joints of the chelipeds are dark greenish blue obscurely mottled with brown, the palms of the chelae dull slate blue, paler distally, and fading to dirty white on the fingers (1).

Distribution. Tasmania, New Zealand, Victoria, and the east coast of Australia; the most northern locality from which the Australian Museum possesses specimens is Brisbane.

Remarks. In Tasmania these crabs inhabit burrows in mud between tide marks near the mouths of rivers; further north they live in mangrove swamps. From their habit of brandishing their chelipeds in the air as if signalling to each other, they are often called " Semaphore Crabs ". Ward (l.c.) gives a good account of their habits.

(1) There is probably some distributional variation in the colour: small specimens collected near Sydney have the chelae bright red which turns to purple in the adult. No Tasmanian examples that I saw were thus coloured.

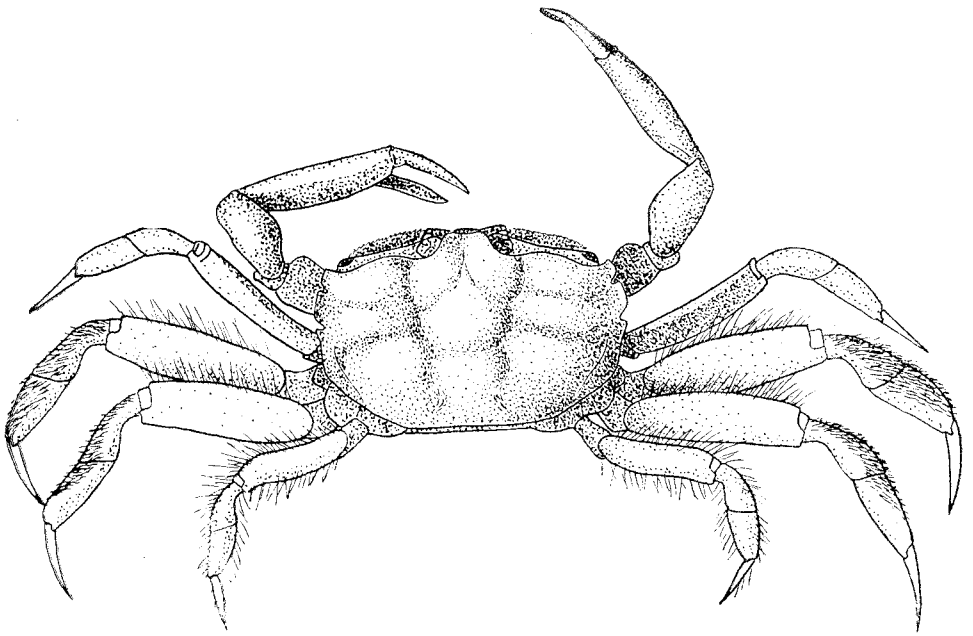

FIG. 10.—*Hemiplax latifrons*, ♂

Hemiplax latifrons (Haswell). Fig. 10

Haswell, 1882, p. 90 *(Macrophthalmus latifrons).*
Etheridge and McCulloch, 1916, p. 13.
Hale, 1927 a, p. 186.

Material. Specimens from the River Carlton, and from Orford on the east coast, compared with the type in the Australian Museum.

Description. The carapace is broad, about half as wide again as it is long, and the inter-regional grooves are well marked. The lateral borders are slightly convex and divided anteriorly by two notches into three teeth (including the outer orbital angle). The second of these is broad and blunt and the third small and angular, and both are turned up so that their edges are considerably above that of the outer orbital angle. The front is between $\frac{1}{4}$ and $\frac{1}{5}$ of the breadth of the carapace, and its upper surface is concave. The upper orbital border is sinuous and finely beaded, and the lower is prominent, being visible in dorsal view, and finely denticulate. The chelipeds of the adult are long and fairly robust, those of females and young males small and slender. The chelae are finely granular over the whole of their surface, and the palm and immovable finger are bordered below by a ridge which tends to become obsolete in large males, but is very prominent in females. The immovable finger curves down from the palm, and both fingers are denticulate on the biting edges except at the base of the dactylus. The walking legs are fairly long and very hairy, the hair being especially thick on the carpi and propodi of the second and third legs. The largest male is 27 mm. in carapace breadth.

Colour. Dark greenish or greyish brown; the chelae paler. I have seen no specimens approaching "creamy yellow" as described by Hale (l.c.), p. 187.

Distribution. Tasmania and south-eastern Australia.

Remarks. The characters of this species are misrepresented in Tesch's key to the genus *Macrophthalmus* (1915, p. 154, 155). It is placed in category 17 ("greatest breadth of carapace between the outer orbital angles"), whereas in reality the greatest breadth is at the level of the hindmost lateral teeth, and the species should be in category 20.

These crabs live in burrows in soft mud. They are found at low tide in the same localities as *Heloecius*, but always nearer the water's edge. They also extend further up the rivers than *Heloecius*, and are therefore probably more tolerant of fresh water.

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