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carried on by the F.I.S. "Endeavour" 1909-14

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Commonwealth Director of Fisheries

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Report on the Crabs obtained by the F.I.S. "Endeavour"
on the Coasts of Queensland, New South Wales,
Victoria, South Australia and Tasmania.

BY

MARY J. RATHBUN,

Associate in Zoology, United States National Museum,
Washington.

Plates xvi.-xlii., and Figures 1-3.

REPORT ON THE BRACHYRHYNCHA,
OXYSTOMATA AND DROMIACEA.

THIS report includes all the brachyuran crabs of the "Endeavour" collection other than the Oxyrhyncha or spider crabs, which were enumerated in Vol. V., part 1, 1918, with one exception here noted. There are sixty-one species listed below, and fourteen of these are new. There are also, among the species previously known, several which are additional to the Australian fauna: *Pinnotheres novazelandia*, *Pilumnoplax heterochir*, *Liagore rubromaculata*, *Chlorodopsis pilumnoides*, *Pilumnus spongiosus*, *Acanthodes armatus*, *Charybdis natator*, *C. truncata*, *Myra fugax*, *Calappa lophos* and *Dromidiopsis edwardsi*. The most noteworthy is *Acanthodes armatus*, which, although described by de Haan in 1835, has been found rarely, and then only in Japanese waters.

I am indebted to Mr. Allan R. McCulloch for allowing me to introduce some of his notes, made several years ago, and for making it possible to examine several Australian *Pilumnus* not in the "Endeavour" collection.

Order DECAPODA.
Suborder REPTANTIA.
Tribe BRACHYURA.
Subtribe BRACHYGNATHA.
Superfamily OXYRHYNCHA.
Family INACHIDÆ.
Subfamily INACHINÆ.

PARATYMOLUS LATIPES QUADRIDENTATA, Baker.

Paratymolus latipes var. *quadridentata*, Baker, Trans. Roy. Soc. S. Australia, xxx., 1906, p. 107, pl. i., fig. 2.

Spencer's Gulf, South Australia, 20 fathoms; E.4442; one female with carapace 6.5 mm. long to tips of frontal teeth, and 6.3 mm. wide including spines.

Chelipeds of female shorter than of male, as figured by Baker, the merus scarcely reaching beyond the lateral angle of the carapace. The merus has a spine instead of a tubercle on its upper margin. The major chela, in this case on the right side, has an enlarged tooth at the base of the dactylus, which is absent from the slightly smaller, minor chela. The first three pairs of ambulatory legs are longer than the chelipeds.

This species was accidentally omitted from the report on spider crabs, vol. v., part 1, of this series, on account of its strong resemblance to *Telmessus*, save for the arrangement of the basal antennal segment.

Superfamily BRACHYRHYNCHA.

Family GRAPSIDÆ.

PLAGUSIA CAPENSIS, de Haan.

Grapsus (Plagusia) capensis, de Haan, Fauna Japon., Crust., 1835, pp. 31 and 58.

Plagusia capensis, Stebbing, South African Crust., Part iii., 1905, p. 47 and synonymy.

Plagusia chabrus, Rathbun (perhaps not Linnæus), Bull. U.S. Nat. Mus., xcvii., 1918, p. 336, pl. civ.

Bass Strait?; E.444; one female of medium size. The front is bordered by conical spines and tubercles, two or three being pointed, and the rest rounded at tip.

Family PINNOTHERIDÆ.

PINNOTHERES SUBGLOBOSA, Baker.

(Plate xvi., fig. 1, and Fig. 1.)

Pinnoteres subglobosa, Baker, Trans. Roy. Soc. S. Australia, xxxi., 1907, p. 179; 17 fathoms, South Australian coast.

Off Marsden Point, Kangaroo Island, South Australia; 17 fathoms; E.4519; one female.

Length of carapace 7.6, width at middle 7.8, postero-lateral width above the first ambulatory leg 9.6, length of carapace and the part of the abdomen visible in dorsal view 9.2, fronto-orbital distance 2.4, front 1.3 mm.

Carapace thin and yielding, high, the upper surface transversely oblong-globose, the sides spreading outward posteriorly. Posterior margin, between legs of last pair, transverse. Two broad shallow furrows lead backward from the orbits but do not meet. Eyes colourless, fitting in the orbits.

Palp of maxilliped two-segmented, lacking a dactylus.

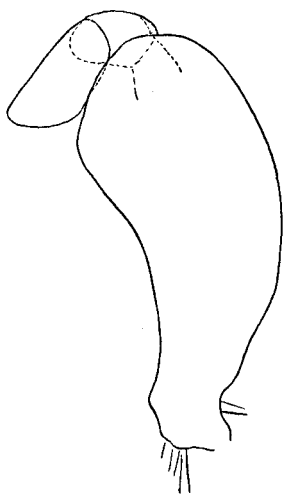


Fig. 1.—Left outer maxilliped, *Pinnotheres subglobosa*.

The slender palm is more than twice as long on its upper margin as its greatest width. The whole propodus has a slightly sinuous lower margin, and a fringe of hair on the inner surface just above the margin; the finger embraces less than one-third of that margin.

Legs similar, dactyli curved; second pair longest, its dactylus also longest; the first and third legs are subequal, the fourth shortest. The left leg of the second pair is longer than the right; whether this is individual or a specific character as in certain American species, only an examination of further material can determine.

The abdomen is very capacious, wider than the widest part of the carapace and envelops the sternum and bases of the legs. The sternal cavity has a dense fringe of hair.

PINNOTHERES NOVÆZELANDIÆ, *Filhol.*

(Plate xvi., fig. 2, and Fig. 2.)

Pinnotheres novæ zelandiæ, Filhol, Miss. l'Île Campbell, Crust., 1885, p. 395, pl. xlvi. in atlas, figs. 1-6.

Pinnotheres novæ-zelandiæ, Lenz, Zool. Jahrb., Syst., xiv., 1901, p. 467, pl. xxxii., figs. 11-14.

East coast of Flinders Island, Bass Strait; E.5676; one female. Approximate length of carapace 8.4, width 8.5, fronto-orbital width 3.8, width of front 1.6 mm.

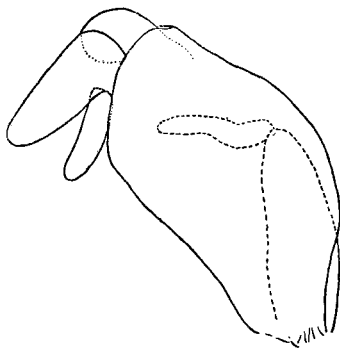


Fig. 2.—Left outer maxilliped, *Pinnotheres novæzelandiæ*.

Carapace soft and much wrinkled, nearly circular; front invisible in dorsal view, and covered by the abdomen, which reaches in all directions beyond the carapace. In front view the margin of the front is straight; the eyes are faintly pigmented, the orbits extend laterally beyond the eyes to a distance as long as the eyes, gradually tapering but not to a point; the margin of the orbit is bluntly rounded, not an acute rim.

Chelipeds rather small, chelæ shaped as represented by Lenz in his fig. 11, *op. cit.* Ambulatory legs slender, similar, dactyli curved; second pair a little the longest; second, third and fourth pairs regularly diminishing, first pair subequal to third. In dorsal view, the upper margin of the merus and the lower margin of the dactylus are conspicuously haired; there are also some hairs on the distal end of the propodus and on the inner surface above the lower margin.

Family GONEPLACIDÆ.

PILUMNOPLAX HETEROCHIR (*Studer*).

(Plate xvii., figs. 1-2.)

Pilumnus heterochir, Studer, Abhandl. k. Akad. Wiss. Berlin, ii., 1882 (1883), p. 11, pl. i., fig. 3 *a-d*.

Pseudorhombila (*Pilumnoplax*) *normani*, Miers, in Narr. Challenger Exp., i., part ii., 1885, p. 587.

Pilumnoplax heterochir, Miers, Challenger Rept., Zool., xvii., 1886, p. 227, pl. xix., figs. 1-1*d*.

South of Gabo Island, Victoria, 200 fathoms; E.6211; one male, two ovigerous females.

South of Cape Everard, Victoria, 200 fathoms; E.6152; one young male.

Forty miles South of Cape Everard, Victoria, 200-270 fathoms; E.6155; two males, three ovigerous females.

East-north-east of Maria Island, Tasmania, 127-180 fathoms; E.5168; one male, one female.

Measurements.—Largest male (E.6211), length of carapace 8.2, width 11 mm. Largest female (E.6211), length of carapace 9.3, width 12.8 mm.

In all the specimens the right cheliped is the larger except in the largest male. In comparing this male with one 8.6 mm. wide or about the size of Miers's figured specimen, the dark colour runs a little further back on the palm in the larger one; in all the males the colour margin is oblique to the lower margin, not at right angles to it as in Miers's figure 1*b*, and as in the female specimens. In the young male (E.6152), 4.8 mm. wide, the granulation of the major palm is much coarser than in larger specimens.

CARCINOPLAX MERIDIONALIS, *sp. nov.*

(Plate xviii.)

Type-locality.—Seventeen and a half miles south-east of Rame Head, Victoria, 76 fathoms; May 10, 1911; E.2233; one male, holotype.

Additional localities.—South-east of Cape Everard to South of Gabo Island, Victoria, 70-80 fathoms; E.6487; three females.

South of Mt. Cann, Victoria, 55-70 fathoms; E.6079; one male.

South and south-west of Mt. Cann, Victoria, 70-100 fathoms; E.6116; two males, two females. E.6117; one female, with encrusting Serpulid.

South-south-west of Mt. Cann, Victoria, forty miles, 70 fathoms; E.6276; two females, one immature, one ovigerous, both very small.

East of Bass Strait, 70-80 fathoms; E.4820; two males, two females.

Twenty miles east of Babel Islands, Bass Strait, 65-70 fathoms; E.5159; one young male.

Off Babel Islands, Bass Strait, 50-300 fathoms; E.4785; one male.

South-west of Eucla, about long. 127° E., Great Australian Bight, 80-120 fathoms; E. 3661 and 3662; two males, two females.

Sixty to eighty miles west from Eucla, Great Australian Bight, 80-120 fathoms; E.3167; one male, one female. P.3552; one female.

South Australia; E.4438; one male.

Measurements.—Male holotype, length of carapace 21.7, width (approximate) between tips of lateral spines 30.2, width just in front of lateral spines 27, fronto-orbital width 17.8, front 8.3 mm. Largest female (E.6117), length of carapace 22.3, width between tips of lateral spines 30.4, width just in front of lateral spines 28.2, fronto-orbital width 18.4, front 8.6 mm. One of the two smallest females (E.6276) is ovigerous, carapace 5.8 mm. long.

Description.—Carapace very convex fore and aft. A short, obliquely transverse branchial ridge near lateral tooth; postero-lateral angle of dorsum also marked by a smooth ridge. Two transverse depressions, one in front of, the other behind, the cardiac region. Three antero-lateral projections; the first or orbital tooth is blunt, produced little in advance of orbital angle, its inner slope short and continuing the supraorbital margin, outer slope convex; second tooth longer and with a sharp tip, directed forward; third projection a stout, acuminate spine, directed obliquely outward. Front transverse, or nearly so, double-edged, upper edge less advanced than lower. Antennal sinus well defined. Supraorbital fissure obscure. Suborbital margin crenulate; inner angle nearly as advanced as the front.

The major cheliped is considerably heavier than the minor one; of the 25 specimens possessing chelipeds, all but four have the major cheliped on the right side. On the upper border of the arm distad of the middle there is a rounded lobe; dorsal aspect of wrist an elongated rhomb, with a spine at the inner angle, and a smaller one at the outer angle. In the male the dark brown colour of the immovable finger embraces a small part of the palm except in its upper part where it does not quite cover the prehensile edge; on the dactylus the colour does not quite cover the proximal end but seems to cover the prehensile edges when the fingers are closed. In the female the brown is much more restricted, extending on the outside edges less than half the length from the tip in the full-grown, or quite half the length of the dactylus in the half-grown; on the prehensile edges the colour runs much further, half or more than halfway on the immovable finger, and nearly the whole length on the minor dactylus and quite the whole length on the major dactylus.

Ambulatory legs long and slender; last three articles sparsely fringed with long, fine hair; the dactyli have also two marginal stripes of dense pubescence.

The male abdomen is nearly triangular from the third segment to the tip, posterior margin of terminal segment arcuate. The sternal furrow just in front of the bases of the chelipeds forms a slightly obtuse angle at the median line.

CARCINOPLAX VICTORIENSIS, *sp. nov.*

(Plate xix.)

Type-locality.—South of Gabo Island, Victoria, 120-275 fathoms; E.4395; one male, holotype.

Additional localities.—South of Gabo Island, Victoria, 180-150 fathoms; E.4394; one female.

Off Gabo Island, Victoria, 80-100 fathoms; E.4779; one male with Serpulid shell on the merus of the left maxilliped.

Off Gabo Island, Victoria, about 200 fathoms; E.5196; four very young.

South-east of Cape Everard to south of Gabo Island, Victoria, 70-80 fathoms; E.6091; one young female.

Measurements.—Male holotype, length of carapace 24.4, width (approximate) between tips of lateral spines 34, width just in front of lateral spines 31.3, fronto-orbital width 20, front 9.3 mm. Largest specimen, male (E.4779), length of carapace 27.3, width between tips of lateral spines 37.4 mm. Length of carapace of a very young crab (E.5196) 3.6, total width of same 4.4 mm.

Description.—Of similar appearance to the preceding and at a glance might be mistaken for it.

The chief differences are:—

The antero-lateral angle of the carapace is coincident with the outer angle of the orbit, instead of being advanced beyond the orbital angle to form a tooth.

The first of the marginal teeth is less dentiform, its sides at an oblique angle to each other, meeting in a short, acute tip.

The spine at the lateral angle of the carapace is directed more outward.

The supra-orbital fissure is more deeply marked.

The wrist is squarer, less elongate.

The proximal end of the palm, opposite the carpal spine is produced in a tubercle.

The fingers are longer, slenderer and bent downward beyond the lower border of the palm. In preserved specimens they are almost colourless; only on the teeth of the distal third to half is there trace of a violet brown.

The dactyli of the ambulatory legs are almost covered with dense pubescence; a thinner coating of similar hairs runs along the greater part of the upper margin of the propodal segments and a short way on the lower margin.

Variations.—The chelipeds become very massive with age; the largest male (E.4779) lacks the major cheliped but the minor one is much larger than in the type specimen which has a somewhat smaller body.

The fingers of the females (there are none of large size in the collection) are little deflexed.

A young female (E.6091), 8.7 mm. long, has the first antero-lateral projection spiniform or tipped with a slender spine so that it has a strong resemblance to the spine at the lateral angle; the granulation of the hands is more pronounced than in the old.

The four young crabs registered E.5196, probably represent one of the earliest stages of the crab-form. The carapace is very narrow, as may be seen from the measurements, and subquadrate, the sides being parallel except just behind the orbit; the two lateral spines are nearly the same size and shape. The granules of the palm are arranged partly in longitudinal rows and mixed with fine hair.

Family XANTHIDÆ.

Subfamily XANTHINÆ.

XANTHO BOWENENSIS, *sp. nov.*

(Plate xx.)

Type-locality.—Seven miles north-north-east of Bowen, Queensland, 16 fathoms; E.3097; one male, holotype.

Measurements.—Male holotype, total length of carapace 31, greatest width, at last pair of lobes, 46.3, fronto-orbital width 17.6, front 10 mm.

Description.—Carapace very convex fore and aft, closely covered with uneven granules, which are smaller in the depressions; anterior two-thirds well areolated, areoles 1 L and 2 L fused,¹ and with 3 L and 4 L high and *Actœa*-like; 5 L and 6 L lower and partially fused; a small, transverse, oval areole on the posterior cardiac region; anterior mesogastrium very narrow; protogastric regions unevenly and incompletely divided; epigastric lobes distinct. Of the four lateral lobes, E is very low, N and T are obtuse-angled, S is rounded. Front not visible in dorsal view; median fissure closed, its sides overlapping; on each side a truncate lobe occupies less than half the front; a broad, shallow sinus separates it from the pointed outer tooth; no supra-orbital angle. Suborbital region, reaching to a line from the buccal angle to lateral tooth N, roughly granulous like the dorsum. The fissures either side of N are continued on the lower surface where they almost meet in a small, circular depression.

Chelipeds equal in male, closely granulous, the granules smaller and smoother on the merus than on the carpus and propodus; carpus slightly furrowed; chelæ short, stout, tapering distally; fingers black, fluted, with blunt tips, and meeting when closed.

¹ See Dana—Crust. U.S. Expl. Exped., part i., 1852, p. 29.

Legs granulous, the three principal segments short and broad; dactyli hairy between the granules.

Remarks.—This is not a typical *Xantho* in all respects, it is too convex at its middle, and the front too deflexed, and uncommonly narrow. On the other hand, the orbits and antennæ are typical, the flagellum not excluded from the orbit.

PSEUDOCARCINUS GIGAS (*Lamarck*).

Cancer gigas, Lamarck, Hist. Anim. sans Vert. v., 1818, p. 272.

Pseudocarcinus gigas, Milne Edwards, i., 1834, p. 409.
McCoy, Prodr. Zool. Victoria, ii., Dec. xviii., 1889, p. 293, pls. 179 and 180. McNeill, Rec. Austr. Mus., xiii. 3, 1920, p. 180.

East of Bass Strait; E.6094; one male, with *Lepas* attached.

East-north-east of Maria Island, Tasmania, 127-180 fathoms; E.5169; one young female.

East of Maria Island, Tasmania, 50-100 fathoms; E.6241; one young male.

North-east of Cape Pillar, Tasmania, 50-60 fathoms; E.6174; one young.

Thirty-five miles south-east of Bruni Island, Tasmania, 150-230 fathoms; E.5155; one young female.

South of Eucla, Great Australian Bight, long. 129° 28' E., 250-450 fathoms; E.3701; one male, with *Lepas*.

Great Australian Bight, 80-120 fathoms; E.3698; one female, with *Lepas*.

Southern Australia; one immature female.

A series of eight specimens, the three largest of which are 140 mm. wide or a little smaller, and the remainder graduated down to one 12.3 mm. wide. In small specimens the carapace is roughly granular except in the furrows; the granules on the inner and outer surfaces of the hand tend to form more or less distinct rows. All the spines on the carapace and legs are much more acute than in larger examples; in carapaces under 40 mm. wide, four of the lateral spines are much more developed than the intermediate ones, and the third and fourth large spines, or those near the widest part of the carapace are longest. The teeth on both fingers are proportionately larger. The chelipeds are subequal in size though the right is the larger.

As the specimens increase in size, all these characters become less marked except the size of the hand, the right becoming gradually larger than the left.

The red colour of the back may be uniform, as described by McCoy, or divided up into different patterns in different specimens. It may form vermiculating lines on the yellow ground colour or the latter may break through it as irregularly shaped spots. The chelipeds are all marked with vermicular red lines, and the fingers are uniformly scarlet at their junction with the hand.²

LIAGORE RUBROMACULATA, de Haan.

Liagore rubromaculata, Alcock, Journ. Asiat. Soc. Bengal, lxxvii., 1898, p. 93 [328] and synonymy.

Twenty miles north-east of Cape Gloucester, Queensland, 35 fathoms; E.3120; one small female.

New to the Australian fauna.

GALENE BISPINOSA (Herbst).

Cancer bispinosus, Herbst, Naturg. d. Krabben u. Krebse, i., No. 2, 1783, p. 144, pl. vi., fig. 45; and iii., No. 2, 1801, p. 11, pl. liv., fig. 1 (female).

Galene bispinosa, Alcock, Journ. Asiat. Soc. Bengal, lxxvii., part 2, 1898, p. 136 [371], and synonymy; Etheridge and McCulloch, Rec. Austr. Mus. xi. 1, 1916, p. 10, pl. iii., figs. 3-4.

Seven miles north-north-east of Bowen, Queensland, 16 fathoms; E.3096; one male. P.3517; one female.

Twenty miles north-east of Cape Gloucester, Queensland, 35 fathoms; E.3121; one female.

Two of Herbst's specimens were extant in the Berlin Museum in 1896; one is a male, labelled "type," and may be the original of pl. vi., fig. 45, the other is a female and is figured on pl. liv., fig. 1.

² Taken almost wholly from Mr. McCulloch's notes.

Subfamily ACTÆINÆ.

ACTÆA INSKIPENSIS, *sp. nov.*

(Plate xxi., figs. 1-3.)

Type-locality.—Off Point Inskip, Great Sandy Strait, Queensland, 10 fathoms; E.3186; one young male, holotype.

Measurements.—Male holotype, length of carapace 5.1, width of same 7.7, fronto-orbital width 4 mm.

Description.—Carapace, chelipeds and legs furnished with scanty hairs which do not conceal the surface and are scarcely to be noticed. Carapace covered everywhere except on the cardiac and intestinal regions with fine, sub-equal granules; well, but not deeply areolated; areolations but not granulations visible to the unaided eye. Each protogastric region is divided by a shallow, longitudinal sulcus which fades out posteriorly, into two unequal parts, the inner part half as wide as the outer; epigastric and antero-external protogastric lobes swollen. In the language of Dana,³ lobes 1 L and 2 L are scarcely separate, 3 L and 4 L are well marked, 5 L shows a tendency to subdivide, 6 L is faintly outlined behind, 1 R, 2 R and 3 R are continuous. Of the marginal lobes, N, T and S are prominent and somewhat angled, E is nearly flat. Postero-lateral margin concave; above the posterior margin there is a narrow, raised, bilobed and crenulated ridge. Frontal lobes in front view with sinuous margins separated by a median fissure; at the outer ends an independent, triangular tooth bent downward.

Chelipeds of immature male small; carpus granulous like the carapace, and with a few shallow furrows. Granules of palm arranged largely in longitudinal rows especially on the lower half of the outer surface; immovable fingers with two outer furrows, the lower one leading from the palm and tapering to a point, the upper one reaching only to middle of finger, a tooth on prehensile edge near its base; dactylus with a deep groove below the upper margin, a small tooth near the base of that margin, a large basal tooth or tubercle on the prehensile margin and a shallow tooth further out and distad to that on the immovable finger.

Legs granulous, except on the posterior surface of the merus joints, the granules more pointed than on carapace.

³ Dana—Crust. U.S. Expl. Exped., part i., 1852, p. 29.

Relationship.—Closely related to *A. obesa*,⁴ A. Milne Edwards, which also has a broad-oval carapace with numerous granules, similar areolations, and chelæ of the same form. In *obesa* the lateral lobes are rounded, not at all angular, and are not separated from the neighbouring areoles, the granulation is very coarse especially on the lateral thirds, and the posterior part is finely granulate, not smooth as in *inskipensis*; the posterior surface of the merus of the last leg is granulous, not smooth; the dactylus of the cheliped has a row of spinules on the upper margin instead of a single denticle.

ACTÆA PERONII, (*Milne Edwards*).

(Plate xxi., figs. 4-5.)

Xantho peronii, Milne Edwards, Hist. Nat. Crust., i., 1834, p. 392.

Xantho spinosus, Hess, Arch. f. Naturg., xxxi., 1865, pp. 132 and 171, pl. vi., fig. 3.

Actæa peronii, Haswell, Cat. Austral. Crust., 1882, p. 46.

From sixty miles south of Diana's Peak to about forty miles south of Mt. Cann, Victoria, 70-80 fathoms; E.6086; two males, one female.

South of Mt. Cann, Victoria, 55-70 fathoms; E.6080; one young female.

East coast of Flinders Island, Bass Strait; E.5672; one male, six females.

Forty miles west of Kingston, South Australia, 30 fathoms; E.4464; one young.

Marsden Point, Kangaroo Island, South Australia, 17 fathoms; E.4465; one young.

North of Cape Borda, Kangaroo Island, 40 fathoms; E.4463; one female.

Sander's Bank, Kangaroo Island, 28 fathoms; E.4462; one young.

Spencer Gulf, South Australia, 20 fathoms; E.4461; one female.

South Australia; E.4460; one female.

⁴ Rathbun—Trans. Linn. Soc. London, ser. 2, xiv., 1911, pl. xvi., figs. 4 and 5.

ACTÆA CALCULOSA (*Milne Edwards*).

Cancer calculosus; Milne Edwards, Hist. Nat. Crust., i., 1834, p. 378.

Actæa calculosa, Grant and McCulloch, Proc. Linn. Soc. New South Wales, xxxi., 1906, p. 11, and synonymy.

Fifteen miles north-west of Cape Jervis, South Australia, 17 fathoms; E.4457; two females. E.4459; one young female.

Marsden Point, Kangaroo Island, South Australia, 17 fathoms; E.6485; five males, ten females.

Spencer Gulf, South Australia, 16 fathoms; E.4456; four males, one female.

Subfamily CHLORODIELLINÆ.

CHLORODIELLA NIGER (*Forskål*).

Chlorodius niger, Alcock, Journ. Asiat. Soc. Bengal, lxvii., 1898, p. 160 [395], and synonymy.

North-west Island, off Rockhampton, Queensland; E.4455; one male, one female.

CHLORODOPSIS PILUMNOIDES (*White*).

Chlorodius pilumnoides, Adams and White, Voy. Samarang, Crust., 1848, p. 41, pl. ix., figs. 3 and 3a.

Chlorodopsis pilumnoides, Alcock, Journ. Asiat. Soc., Bengal, lxvii., 1898, p. 167 [402], and synonymy.

Thirteen miles south-east of Cape Capricorn, Queensland, 13 fathoms; E.3146; one young specimen, carapace 5.3 mm. wide.

New to the Australian fauna.

Subfamily PILUMNINÆ.

Genus PILUMNUS, *Leach*.*Key to the Australian species of Pilumnus.*

- a. Abnormal species. Carapace covered with symmetrically disposed, raised, curved or sinuate ridges:— *labyrinthicus*.†
- aa. Normal species in which the carapace is covered wholly or partially with a more or less thick coat of hair and is without raised ridges.
 - b. Carapace covered with a short, close pubescence, unmixed with long hairs.

- c. Antero-lateral teeth each capped by a cluster of granules:—
monilifer.
- cc. Antero-lateral teeth not capped by a cluster of granules.
- d. Carapace transversely suboval.
- e. Carapace with small, red, bead granules showing in the pubescence:—
*rufopunctatus.**
- ee. Carapace without bead granules showing in the pubescence:—
humilis.†
- dd. Carapace narrow, subhexagonal, interregional furrows deep, not concealed by the pubescence.
- e. Merus of ambulatory legs sharply cristate above:—
cristipes.†
- ee. Merus of ambulatory legs not cristate above:—
*spongiosus.**
- bb. Carapace more or less hairy; when covered with a short, close pubescence, it is mixed with long hairs.
- c. Larger palm more than half smooth and bare, at least in male.
- d. Infero-distal portion of outer surface of smaller palm bare and, in male, smooth:—
*fissifrons.**
- dd. Outer surface of smaller palm rough all over and more or less hairy.
- e. Last three antero-lateral teeth armed with long, slender spines. A similar but larger projection at inner angle of wrist:—
*spiniacarpus.**
- ee. Antero-lateral projections dentiform, the last three armed with short spinules. Larger wrist with an acute, conical tubercle at inner angle:—
*tantalus.**
- cc. Larger palm either partially smooth and bare on not more than half its outer surface, or rough all over.
- d. Antero-lateral projections dentiform or lobiform, not spine-tipped.
- e. Palms and fingers finely granulate except on the short, light brown, finger-tips. Chelipeds, legs and anterior carapace ornamented with fringes of long and very fine soft hair:—
*digitalis.**
- ee. Palms tuberculate. Fingers not granulate beyond their basal portions, and nearly all brown. Hairs coarser than in *digitalis*.
- f. Carapace half smooth and bare. Fringes of long hair on anterior and lateral portions. Whole outer surface of larger palm tuberculate:—
*semilanatus.**
- ff. Carapace covered with hair or pubescence.

* The name *humilis* was suggested as an alternative by Miers (Crust. "Alert," 1884, p. 221, pl. xxi., fig. B) for specimens which he doubtfully labels *P. lanatus* Latreille. Latreille, however, in concluding his brief description (Encyc. Méth., Entom., x., 1825, p. 125) compares *lanatus* with *vespertilio*, as follows: "Un peu plus grand que le précédent, avec les serres épaisses et graveleuses; d'ailleurs presque semblable. Variété peut-être du mâle de cette espèce." This indicates a much closer resemblance of *lanatus* to *vespertilio* than one would ascribe to the trim looking species figured by Miers, *loc. cit.* I have, therefore, used the name *humilis* for his species.

- g. Two notches in upper margin of orbit. A subhepatic tooth present. Carapace rough with small, granulate areoles and covered with distinctly separated bunches of hair.
- h. Fingers whitish or lightish:— *vespertilio.*
- hh. Fingers blackish:— *lanatus.†*
- gg. One notch in upper margin of orbit. No subhepatic tooth. Carapace finely, and in the centre, sparingly granulate; hairs soft, without definite arrangement:— *contrarius.**
- dd. Antero-lateral projections (some or all) either spines or spine-pointed teeth.
- e. Antero-lateral projections simple, not bifid nor with spinules on their slopes.
- f. Large hand ornamented with rounded granules. Outer orbital angle a small tooth, not spine-tipped.
- g. Granules of palm arranged in longitudinal series and almost concealed in pubescence or hairs.
- h. Carapace wide, one and a third times as wide as long. Anterior carapace, wrist and palm clothed with short pubescence:— *seminudus.†*
- hh. Carapace narrow, less than one and a fourth times as wide as long. Carapace, wrist and palm clothed with long hairs:— *pulcher.*
- gg. Granules of palm not arranged in rows or concealed by pubescence:— *terrae-reginae.†*
- ff. Large hand ornamented with spines or pointed tubercles or granules. Outer orbital angle a spine or tooth with sharp tip.
- g. Large hand ornamented chiefly with spines, less than half smooth and bare. Three antero-lateral spines long, slender, horny, set in cylindrical bases from which spring a few long hairs.
- h. No subhepatic nor outer orbital spine:— *australis.†*
- hh. A long, slender, subhepatic spine. A similar spine at outer angle of orbit:— *acer.**
- gg. Large hand ornamented with conical, pointed tubercles. Antero-lateral spines slender, set in triangular or conical bases. A small, subhepatic spinule.
- h. Larger palm half smooth and bare:— *hirsutus.**
- hh. Larger palm nearly all rough, tubercles largely seriate:— *vestitus.*
- ee. Antero-lateral projections either bifid or with spinules on their slopes.
- f. Antero-lateral teeth bispinous, the anterior spine the larger. Both palms smooth just above lower margin:— *etheridgei.**
- ff. Antero-lateral teeth spine-pointed and with several much smaller spinules on their slopes. Larger palm only is smooth just above lower margin:— *tomentosus.**

* In the "Endeavour" collection. † Not seen by the writer.

SPECIES OF PILUMNUS REMOVED TO OTHER GENERA.

P. glaberrimus, Haswell, 1881. Now *Ceratoplax glaberrimus* (Haswell) = *C. punctata*, Baker, 1907. Haswell's type examined.

P. inermis, Haswell, 1881. Now *Ceratoplax inermis* (Haswell). Type not found; specimen from Saddleback Island, Queensland, examined.

P. integer, Haswell, 1881. Photographs of type (dorsal views) examined. Should be referred to *Chasmocarcinus* or a kindred genus.

P. pilosus, Fulton and Grant, 1906. Now *Heteropilumnus fimbriatus* (Milne Edwards, 1834). Not *P. fimbriatus*, Haswell, 1882 = *Cryptocaloma fimbriatum*, Miers, 1884. See de Man (who examined Milne Edwards's types), Zool. Jahrb., Syst., viii., 1895, p. 533.

P. fimbriatus, Haswell, 1882. Now *Cryptocaloma haswelli*, nom. nov. = *C. fimbriatum*, Miers, 1884, not *P. fimbriatus*, Milne Edwards, 1834. Male specimen from Port Denison, Queensland, examined.

PILUMNUS SPONGIOSUS, *Nobili*.

Pilumnus spongiosus, Nobili, Bull. Mus. Hist. Nat., Paris, 1905, No. 6, p. 406; Ann. Sci. Nat., Zool. (9), iv., 1906, p. 280, pl. x., fig. 6.

South of Gabo Island, Victoria, 200 fathoms; E.6212; one male. Carapace length 5.6 mm., width 7.1 mm.

This specimen is much smaller than those described by Nobili; the carapace is proportionally narrower than that of the female measured by him, the distance being shorter from the orbit to the second of the five lateral teeth. In nearly every respect the "Endeavour" specimen agrees with the descriptions cited; there is, however, indication of a transverse fringe of hair on the front, though it is incomplete; the pubescence in front of the fringe is shorter than behind it; only one row of granules is discernible on the margin. It may be added that both fingers of both chelæ are deeply grooved, and the granulation extends half the length of the dactyls and almost to the tips of the immovable fingers.

PILUMNUS DIGITALIS, *sp. nov.*⁶

(Plate xxii.)

Type-locality.—South 29° east of Pine Peak, Queensland; E.6486; one male, holotype. Length of carapace 9, width 12, width of front 4.8, distance between outer angles of orbits 9, length of penultimate leg 16.8 mm.

Additional locality.—Eleven to fourteen miles northwest of Pine Peak, Queensland, 24-26 fathoms; E.3188; one male.

This species belongs to the group of *P. trichophorus*⁷ de Man, *P. trichophoroides*⁸ de Man and *P. borradailei*⁹ Rathbun. Like them it has the posterior half of the carapace flat, the surface of body and legs almost entirely covered with a coat of short hair, while fringes of long hair ornament the anterior third of the carapace, and also the chelipeds and legs. The new species has a narrower carapace, its length just three-fourths of its width; the fronto-orbital distance is greater in proportion to width of carapace; the regions are mostly well defined, the mesogastric, protogastric, frontal, cardiac, anterior branchial and posterior branchial; while a furrow sets off the narrow marginal rim of the front, the wider, inner margin of the orbit, the posterior margin, and partially circumscribes an inner branchial areole. The outer of the two emarginations of the upper orbital margin is much the larger and helps to define the dentiform outer angle, which is more acute than the three succeeding blunt teeth of the antero-lateral margin of the carapace. The transversely oblique ridge leading inward and forward from near the hinder part of the posterior tooth is pronounced and granulate. A similar ridge is subparallel to the antero-lateral margin, and runs from the gastric region to a point opposite the third tooth.

⁶ It should be noted that, in drawing the different species of *Pilumnus*, the carapace has been inclined so as to represent the true edge of the front, even though that edge is invisible in a strictly dorsal view.

⁷ de Man—Zool. Jahrb., Syst., viii., 1895, p. 544; ix., 1896, pl. xiii., figs. 7-7e.

⁸ de Man—*Op. cit.*, p. 549, pl. xiii., figs. 8a-8e.

⁹ Rathbun—Proc. Biol. Soc. Washington, xxii., 1909, p. 113.

Chelæ somewhat unequal, covered with a fine but dense granulation reaching nearly to the tips. The horny tips, to which the long hair extends, are in the case of the movable finger only one-fifth of the length of the whole finger. The specific name draws attention to this peculiarity.

Ambulatory legs shorter than in *trichophorus* and *trichophoroides*, the penultimate leg being less than twice as long as the fronto-orbital distance.

PILUMNUS CONTRARIUS, *sp. nov.*

(Plate xxiii.)

Type-locality.—Twelve miles north-north-east of Bowen, Queensland, 19-25 fathoms; E.3155; one male, holotype.

Measurements.—Male holotype, total length of carapace 11.6, total width 13.5, fronto-orbital width 9.4, width of front 5 mm.

Description.—A narrow species without spines, clothed with uneven, ragged-looking hairs. Carapace covered with short and rather fine hair, also long, coarse hair disposed in a line behind the front, a bunch on each protogastric region and a larger patch near the margin at the widest part of the carapace. When the hair is removed, the hepatic region is seen to be marked off by a wide furrow, the epigastric regions are isolated, the protogastric regions are continuous with the broad part of the mesogastric region, the median furrow, including the narrow part of the mesogastric region, is deep, the epibranchial lobe is raised, the lateral teeth are separated off in a sort of rim. All the most elevated parts of the carapace including the frontal, epigastric, middle part of protogastric, hepatic and epibranchial lobes, also the antero-lateral teeth and the postero-lateral regions are granulate.

The large lobes of the front are broadly rounded, median notch of good size, lateral notches larger, the outer teeth slightly acute. Inner upper angle of orbit almost obsolete. Margins of front and orbit granulate, one well-marked superior orbital notch, a shallow notch below outer angle, a thick, triangular tooth at lower, inner angle. Suborbital and subhepatic regions very finely granulate; no subhepatic tooth nor spine. Four antero-lateral teeth, the first low, second largest, carapace equally wide at the third and the fourth tooth.

Chelipeds and legs clothed with long hair, through which the surface is imperfectly seen; arm with a large, subterminal tooth above, lower and inner margins tuberculated; carpus finely and sparingly granulate, a small tooth at inner angle; larger palm unevenly tuberculate, the tubercles largest on upper surface and on lower, distal portion of outer surface; proximal half of lower margin tuberculate; fingers smooth except upper, proximal end of dactylus; two grooves on outer surface of fixed finger, which is slightly deflexed. Minor palm considerably smaller, tuberculation continued so as to embrace the whole lower surface, and part of the fingers, each finger with three deep grooves on the exposed surfaces. Legs almost entire, the upper margin of the merus finely and obscurely roughened.

Remarks.—In shape this resembles some species of *Heteropanope* Stimpson.¹⁰ Of the species of *Pilumnus*, it has much in common with *P. marginatus* Stimpson¹¹ from Loo Choo, but the carapace of the latter is wider with more convergent postero-lateral borders and the hands are more finely roughened.

In *P. contrarius* the tubercles of the major palm, contrary to the customary rule, increase, instead of diminish, in size toward the distal, lower portion, a fact to which the name draws attention.

PILUMNUS SEMILANATUS, *Miers*.

(Plate xxiv., figs. 1-2.)

Pilumnus semilanatus, Miers, Zool. Alert, Crust., 1884, p. 222, pl. xxii., figs. B and b. McCulloch, Rec. Austral. Mus., ix., 1913, p. 325, fig. 43, and synonymy.

Seven miles north-north-east of Bowen, Queensland, 16 fathoms; E.3099; two females (one ovigerous). P.3519; one male, one female.

Eighteen miles south by west of Lady Elliot Island, Queensland, 18 fathoms; E.4441; two females.

Great Sandy Strait, Queensland; P.3569; one young female.

Off Point Inskip, Great Sandy Strait, Queensland, 10 fathoms; E.3150; one female. E.3183; one young.

¹⁰ Stimpson—Proc. Acad. Nat. Sci. Philadelphia, x., 1858, p. 35.

¹¹ Stimpson—Smithson. Misc. Coll., xlix., 1907, p. 70, pl. ix., fig. 2.

The specimens vary in size from the male (P.3519) 23 mm. long by 29 wide, to the young female (P.3569) 6.5 mm. long by 7.7 wide.

The species may be recognised by its ragged appearance, the carapace more than half smooth and naked, the long, coarse, tubular hairs disposed in tufts on the anterior and antero-lateral portions; besides there is a small tuft above each posterior corner, and a still smaller tuft at each end of the gastro-cardiac suture. The granules and tubercles on the hepatic region are partially exposed. The upper part of wrist and hand is almost bare and armed with large tubercles; the distal half of the larger palm is also bare and the tubercles well spaced. The ambulatory legs are thickly clothed with hair on the upper margin, and in the last pair on the lower margin, while the posterior surface of the last two segments in all the legs is hairy.

PILUMNUS RUFOPUNCTATUS, *Stimpson*.

(Plate xxiv., figs. 3-4.)

Pilumnus rufopunctatus, Stimpson, Proc. Acad. Nat. Sci. Philadelphia, x., 1858, p. 36 [33]; Smithson. Misc. Coll., xlix., 1907, p. 66, pl. viii., fig. 3. Haswell, Cat. Austral. Crust., 1882, p. 66.

Spencer Gulf, South Australia, 16 fathoms; E.4444; four males, four females. The largest male is 9 mm. long, 13 wide; the other specimens are considerably smaller.

The species may be recognised by its short, thick, rather smooth, furry coat in which are embedded the few red granules, which to a certain degree retain their colour in alcohol; the large hand is half granulate, half smooth.

PILUMNUS FISSIFRONS, *Stimpson*.

(Plate xviii., figs. 3-4.)

Pilumnus fissifrons, Stimpson, Proc. Acad. Nat. Sci., Philadelphia, x., 1858, p. 36 [33]; Smithson. Misc. Coll., xlix., 1907, p. 67, pl. viii., fig. 4. Haswell, Cat. Austral. Crust., 1882, p. 68, pl. i., fig. 6.

Off Point Inskip, Great Sandy Strait, Queensland, 10 fathoms; E.3184; two males, one female.

Great Sandy Strait, Queensland; P.3570; one male, one female.

The largest specimen is the male, P.3570, measuring 6.4 mm. long by 8 mm. wide, or 1:1.25. Both females are smaller than the males, the smallest female (P.3570) measuring 4.8 by 6.9 mm. A lot of four specimens from Port Jackson, sent to the U.S. National Museum (Cat. No. 17025) by the Australian Museum, run much larger, one male being 9.6 by 14.4 mm. or 1:1.5. The width of the carapace, it will be seen, increases rapidly with age.

In the "Endeavour" specimens the main pubescence is very short and close, but the tufts scattered about, especially on the elevations are formed of long, coarse but soft, tubular hairs, which are much longer than on the larger specimens; of a different sort are the long, slender hairs on the ambulatory legs and on the granulated portion of the chelipeds.

PILUMNUS TANTULUS, *sp. nov.*

(Plate xxv.)

Type-locality.—Platypus Bay, Queensland, 5-9 fathoms; E.3113; one male, holotype.

Additional localities.—Eleven to fourteen miles north-west of Pine Peak, Queensland, 24-26 fathoms; E.3189; four males, two females (one ovigerous).

South 29° east of Pine Peak, Queensland; P.3573; four males, two females.

Measurements.—Male holotype, total length of carapace 7.3, width including teeth 10.2, fronto-orbital width 7.4, width of front 3.7 mm.

Description.—A small species. Carapace covered with short, dense pubescence and some longer, fine hairs. When the carapace is cleaned, it is seen to be well areolated; antero-lateral regions rough with four elevations, one hepatic, one extending inward and forward from the last tooth, two behind the orbit; postero-lateral regions finely granulate. Frontal lobes almost free of pubescence, margins slightly oblique and granulate, median cut triangular; outer teeth independent, tuberculiform; pre-orbital angle very obtuse and inconspicuous. Two well-marked emarginations in the upper, granulate border of the orbit; a large, slightly acute tooth at outer angle, beneath which there is a narrow notch followed by a

denticulated margin which gradually advances to the acute inner angle. Three thick lateral teeth, more produced than the orbital tooth and each tipped with a small spine. No subhepatic projection, only a few granules. Posterior margin broad.

Chelipeds very unequal, less hairy than carapace, pubescence not concealing roughness, large chela totally bare. Outer surface of merus granulate; upper edge denticulate, a large subterminal tooth, a smaller terminal one; inner edge tuberculate, lower edge partly so. Carpus covered with pointed tubercles, sharper and more spinelike on the smaller carpus, which also has a spine instead of a tubercle at the inner angle. Larger palm bare and smooth except for a band of tubercles or large granules along the proximal end of the outer surface and a patch of the same at the proximal end of the upper surface. Two or three granules at base of dactylus. Fingers light brown, the colour covering the distal two-thirds of the fixed finger and almost the whole of the dactylus. The outer surface of the smaller palm is covered with pointed tubercles arranged in approximately seven rows, and a patch of the same is at the proximal end of the dactylus above. Ambulatory legs hairy, the merus roughened above by fine, unequal spinules.

Relationships.—The very unequal chelæ suggest those of *P. spinicarpus*¹² but in that species the rough area on the larger palm is much greater, also the carapace and legs are longer. The carapace of *tantulus* resembles in shape that of *P. quadridentatus*¹³ de Man, which also has a striking inequality in chelæ, but differs from *tantulus* in having five (instead of four) antero-lateral teeth, counting the post-orbital tooth, and in the larger palm being finely granulate outside.

PILUMNUS ETHERIDGEI,¹⁴ *sp. nov.*

(Plate xxvi.)

Pilumnus lanatus, Fulton and Grant, Proc. Roy. Soc. Victoria, xix., 1906, p. 18, not *P. lanatus* Latreille.

Type-locality.—Ten miles north of Circular Head, Tasmania; E.6490; two males (one is holotype).

¹² See page 123

¹³ de Man—Zool. Jahrb., viii., 1895, p. 537; ix., 1896, pl. xiii., figs. 6-6g.

¹⁴ For Robert Etheridge, junr., late Director and Curator of the Australian Museum.

Additional locality.—Oyster Bay, Tasmania, 26 fathoms; E.5187; one male, two females, two young. Without locality; E.6492; four males, four females (one soft shell).

Measurements.—Male holotype, entire length of carapace 12, width, including spines, 16.5, fronto-orbital width 10.5, width of front between antennal notches 5.5 mm.

Description.—Carapace very convex from front to back, suboval, the front little advanced beyond curve of antero-lateral margins, the latter nearly as long as the convex postero-lateral margins, posterior margin between legs of last pair arcuate. Posterior fourth or third of carapace smooth and bare; remainder covered with a thin coating of short, light-coloured hair, which does not disguise the surface. Regions fairly well outlined; gastro-cardiac depression deep; also the median furrow leading from the mesogastric region to the front. Surface roughened by two or three stout spinules on the hepatic region, by smaller spinules opposite the last lateral tooth, by the granuliform sockets of many of the surface hairs, and by fine, close granulation on the post-lateral regions.

Edge of front invisible in dorsal view, median lobes deeply separated, oblique, extremities broadly rounded; small outer lobe dentiform with a tuberculiform tip. Supra-orbital border irregularly spinulose and granulose, inner angle not accented, notches obscure; outer angle or first antero-lateral tooth broad, tipped by a short, stout, curved spine, behind which is a spinule, and under which are several spinules; a notch separates this tooth from the suborbital margin, armed with four or five stout spinules, and near the inner angle a broad tooth with bispinulose tip. The second, third and fourth antero-lateral teeth are similar to the first, but larger; the fourth has a narrower base than the second and third, and the spinule on its posterior slope may be absent. Submarginal regions granulose and spinulose, subhepatic region with three or more spinules, some of which are visible from above.

Chelipeds of large male stout, unequal, but similar in shape and ornamentation; merus very high, armed above with two large spine-pointed teeth, followed behind by obscure granulation on margin and on outer surface; wrist and hand armed with stout, acute spines, which on the palm become lower and more and more tuberculiform toward the lower and distal margins until they altogether

disappear; dactyli spinulose above at base only; a punctate groove runs backward from the next to the lowest sinus of fixed finger, a similar groove near upper edge of dactylus; also a row of punctæ near the prehensile teeth of each finger; fingers pale brown in the male, darker in the female, the colour not extending quite to their bases. Dorsal aspect of chelipeds hairy.

In the female, the propodus has a straighter lower border, the small palm is rough all over the outer surface and half way down the fingers, the large palm is also rougher than in the male but finely so, and the spinulose area on the dactylus is longer. In the small male the armature of the lesser palm resembles that of the female.

Merus of ambulatory legs subentire above; carpus and propodus armed with spines, carpus with about four, propodus about five.

Remarks.—The convexity of the carapace in connection with the complex lateral spines is sufficient to fix this species.

PILUMNUS TOMENTOSUS, Latreille.

(Plate xxvii., figs. 1-2.)

Pilumnus tomentosus, Latreille, Encyc. Méth. Hist., Nat., Entom., x., Paris 1825, p. 125 (Nouvelle Hollande).
Milne Edwards, Hist. Nat. Crust., i., 1834, p. 418.
Not Filhol, Mission de l'Île Campbell, Paris, 1885, p. 375, pl. xlv., figs. 6-8.

Pilumnus tomentosus (?), Miers, Challenger Rept., Zool., xvii., 1886, p. 160, pl. xiv., fig. 4.

Shoalhaven Bight, New South Wales, 15-45 fathoms; E.278; one male, two females (one ovigerous). P.2139; one ovigerous female.

Off Gabo Island, Victoria, 80-100 fathoms; E.4780; one male, one female.

South-east of Cape Everard to south of Gabo Island, Victoria, 90-150 fathoms; E.6095; three males, three females.

From sixty miles south of Diana's Peak to about forty miles south of Mt. Cann, Victoria, 70-80 fathoms; E.6088; two males, two females.

South of Mt. Cann, Victoria, 55-70 fathoms; E.6081; four males, seven females.

South of Mt. Cann, Victoria, 55-100 fathoms; E.6180; two young (one shedding).

South and south-west of Mt. Cann, Victoria, 70-100 fathoms; E.6119; two females.

East of Bass Strait, 70-80 fathoms; E.4825; two young.

East of Flinders Island, Bass Strait; E.5670; two males, seven females.

East of Flinders Island, Bass Strait; P.2321; one male. P.2322; one male.

East of Flinders Island, Bass Strait, 200-300 fathoms; E.4809; one ovigerous female. E.4810; one male. E.4811; one male. E.4812; one male, one ovigerous female. E.4813; two ovigerous females.

Off Falmouth, Tasmania, 60-70 fathoms; E.6135; one female.

Marsden Point, Kangaroo Island, South Australia, 17 fathoms; E.4454; eight males, ten females.

Spencer Gulf, South Australia, 20 fathoms; E.4440; one female.

Spencer Gulf, South Australia, 16 fathoms; E.6488; two young.

Fifteen miles north by west of Cape Jarvis, South Australia, 17 fathoms; E.4443; two males, one female with Rhizocephalid, one young.

South-west of Eucla, about long. 127° E., Great Australian Bight, 80-120 fathoms; E.3665; one ovigerous female.

Sixty to eighty miles west from Eucla, Great Australian Bight, 80-120 fathoms; E.3176; two ovigerous females. P.3560; one ovigerous female. P.3561; one male. P.3562; one male. P.3563; one male, two ovigerous females.

South Australia; E.4439; one female.

Measurements.—Largest specimen, female, E.3176: Entire length of carapace 25.2, entire width 35, width in front of posterior pair of spines 31.2, width of front, to antennal notches 10.4, width of front and orbits 20.4, width of posterior end of mesogastric region 7.2 mm. Largest male, E.4454: Entire length of carapace 24.4, entire width 31.3, width in front of posterior pair of spines 28.4, width of front to antennal notches 8.9, width of front and orbits 18.8, width of posterior end of mesogastric region 6.2 mm.

Description.—Front advanced, antero-lateral margins arcuate, postero-lateral margins strongly convergent. Surface covered with short, numerous, but not crowded, single, yellow (in alcohol) hairs which entangle a coat of refuse; regions well marked, branchial region partially subdivided, several (three or four) subacute spines or spinules near the marginal spines. Front subtriangular, lobes with a short inner and long outer slope and rounded tip, edge denticulate; outer tooth single, independent, triangular, spiniform. Inner angle of orbit suberect, not at all advanced. Upper orbital margin with a few spinules, two subequal emarginations, and an outer spine of moderate size. Spinules of lower orbital margin larger and more regular than those of the upper margin, inner spine the largest. A narrow subhepatic spine is visible in dorsal view where it appears as a second antero-lateral spine; in side view it is in same straight line as three succeeding spines; these are large, sharp-pointed, conical spines, each with one or more spinules on its slope; the first of the three spines points almost directly forward.

Chelipeds and legs clothed with similar hairs to those on the carapace, but on the legs the hairs are longer; on the chelipeds the hairs are thickest about the bases of the spines. Chelipeds very unequal; merus with a terminal and a subterminal spine above, lower border obscurely denticulate, one or two spinules on inner border; carpus armed with scattered, conical, acute spines, the longest one erect at inner angle. Larger palm covered with numerous, similar spines, pointing distad and sometimes—especially in full grown males—disappearing toward the lower margin and fixed finger; proximal end of lower margin tuberculate. Each finger has two outer, punctate grooves; the dactylus is tuberculate above at its base. Smaller palm similarly armed, usually all over the outside,

the spines showing signs of longitudinal arrangement and continued half way down the dactylus and nearly as far on the immovable finger.

The ambulatory legs are rather broad, and little armed; the merus has a terminal spinule on the upper border and a rightangled subterminal tooth.

The very young have some long soft hairs among the short bristly ones.

Remarks.—*P. tomentosus* is by far the most abundant species of *Pilumnus* in the "Endeavour" collection. One would think from Miers's figure, *loc cit.*, that it was very smooth and trim looking, but it has a strong tendency to collect dirt and is very untidy looking. Some of the spines, especially those on the back, retain a red colour in alcohol.

PILUMNUS HIRSUTUS, Stimpson.

(Plate xxviii.)

Pilumnus hirsutus, Stimpson, Proc. Acad. Nat. Sci., Philadelphia, x., 1858, p. 37 [34]; Smithsonian Misc. Coll., xlix., 1907, p. 69, pl. ix., fig. 1.

Twelve miles north-north-east of Bowen, Queensland, 19-25 fathoms; E.3156; one female.

Twenty miles north-north-east of Double Island Point, Queensland, 30 fathoms; E.4436; one male, one female.

Measurements.—Female (E.3156), total length of carapace 10.1, width including spines 14.1, fronto-orbital width 11 mm. Female (E.4436), length 9.8, width 14.1, fronto-orbital width 10.4 mm. Male (E.4436), length 7.4, width 10.1, fronto-orbital width 7.8 mm. Ratio of length to width in the three specimens, 1:1.4, 1:1.44, 1:1.37, the male being narrower than the females, and the females with a wide range of variation.

There is also some variation in the convexity and in the advancement of the front. The larger female is the most convex, the smaller female has the least produced front, and appears to have (though really has not) the greatest relative fronto-orbital width.

The orbits are very wide, and the distance between the subequal, triangular, superior notches is uncommonly long. The four antero-lateral teeth are similar, having a triangular base and a very slender terminal spine which is shorter in the first or orbital tooth. In only the largest of the three specimens is there a subhepatic spine; it is very short, but visible in dorsal view. In the other two specimens there is on the subhepatic region a cluster of about three sharp granules, which is barely visible from above. The hair on the carapace is very soft and of two sorts, a short, fine fur, with small clusters of longer, coarser hairs, including a line just behind the frontal lobes. These lobes are broadly rounded, and are separated by a large notch; the outer tooth of the front is rather wide as these teeth go, subrectangular, and with a very small point; the inner orbital angle is obtuse and inconspicuous. Upper margin of orbit and front finely granulated; lower margin with a definite outer notch, followed by a short granulate edge and then by sharp spinules mixed with granules.

Chelipeds very unequal; merus with two spines at distal end followed by spinules; wrists and palms armed with sharp tubercles or stout spines, which cover only half of the larger palm, and are seriate on the smaller palm. The brown colour of the fingers does not quite come to their bases. The larger thumb has a punctate groove not far above the margin; the dactylus is rough above near its base. Fingers of smaller chela deeply grooved, and roughened for half their length.

PILUMNUS SPINICARPUS, Grant and McCulloch.

Pilumnus spinicarpus, Grant and McCulloch, Proc. Linn. Soc., New South Wales, xxxi., 1906, p. 15, pl. i., figs. 2 and 2a, and synonymy.

Seven miles north-north-east of Bowen, Queensland, 16 fathoms; E.3100; one female.

Eleven to fourteen miles north-west of Pine Peak, Queensland, 24-26 fathoms; E.3189; one female.

South 29° east of Pine Peak, Queensland; P.5330; one female, one young.

Largest specimen (E.3100), length of carapace 9.8, width 13 mm.