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STUDIES IN AUSTRALIAN CRUSTACEA.

No. 1.

By ALLAN R. McCULLOCH, Zoologist.

(Plate xii.)

Under this heading I contemplate a series of short papers dealing with small collections as they come to hand.

The specimens referred to herein were mostly collected by my friends Mr. J. D. Ogilby, of Brisbane, in Moreton Bay, Queensland, and Mr. J. Gabriel, of Melbourne, in Port Phillip, Victoria. At present I am dealing only with the more notable forms, but an examination of these collections shows that the range of many of the southern species extends much farther northward than is generally supposed and *vice versa*. With further material I hope to be able to add to these, and so place our knowledge of the Eastern Australian Crustacea on a better footing than it is now.

The following species are dealt with:—

Hoplophrys ogilbyi, sp. nov.

Halimus spinosus, Hess.

„ *tumidus*, Dana.

„ *lævis*, Haswell.

Gabrielia, gen. nov.

„ *haswelli*, Fulton and Grant.

„ *punctatus*, Haswell.

Eurycarcinus maculatus, A. M. Edw.

Eucrate hamiltoni, sp. nov.

Trigonoplax unguiformis, var. *longirostris*, var. nov.

Aniculus aniculus, Fabr.

HOPLOPHRYS OGILBYI, sp. nov.

(Plate xii., figs. 2, 2^a.)

Carapace bearing very long and strong spines, and with the regions well defined. The gastric region with two transverse rows of spines, the anterior with seven, and the posterior with

three, of which the median one is the strongest, and very slightly compressed laterally. Two blunted spines on the cardiac region, which are a little less prominent than the posterior gastric one, and two similar ones on the genital area. Branchial region with three spines, a very large and strong one on the anterior portion which is the largest of all the spines on the carapace; another big one extending straight outwards from the lateral epibranchial angle, and a third small spine posteriorly. On the sides anterior to and below the epibranchial spine is another small one marking the commencement of a ridge which extends to the anterior margin of the buccal frame.

There are two spines on the hepatic region, the upper being the larger, and a small one on the pterygostomial. A long spine extends outwards and a little forwards over each orbit, at the base of which is a second smaller one. Post-orbital process with the free border emarginate, and in close contact with the supra-ocular spine. The cornea is surmounted by a spinule. Rostral spines slender and divergent. There are groups of hooked hairs on the frontal, gastric, and lateral branchial regions. The surface is otherwise smooth between the spines.

Basal antennal joint rather slender, with antero-external angle strongly produced so as to be easily seen from above.

Ischium of external maxillipeds with a broad median groove, and the inner margins finely dentate. Merus triangular, with the antero-external angle produced, and the anterior border with a small lobe exterior to the articulation of the flagellum.

Chelipeds slender; the arm and wrist with strong spines on the upper surface and sides. Hand with a spiny tubercle and some small irregularities on the upper margin. Lower finger with a tuft of hairs on its inferior border; the mobile finger curved and crossing the lower one; both finely dentate, and meeting along their proximal half.

Ambulatory legs, with strong spines superiorly; those on the propodi of the three last pairs changing to elevated groups of tubercles. Dactyli curved, and with one or more spinules on the posterior basal portion.

Anterior portion of carapace pink, and some bands of the same colour on the legs; otherwise white except for some fine lines on the posterior portion.

This species differs from *H. vatesii*, Henderson, in the spines of the carapace being much larger and longer. The epibranchial spine is not bifid. The basal antennal joint appears to be more

slender, and there is an additional lobe on the merus of the external maxillipeds.

Off Moreton Bay, Queensland, in eight fathoms, living upon a colony of *Spongodes*. The colour and formation of the carapace closely resemble its host, as in *H. oatesii*, while fragments had been broken off and fastened in the hooked hairs to complete the imitation. Named after Mr. J. D. Ogilby, who collected the specimen.

HALIMUS SPINOSUS, *Hess*.

Halimus spinosus, Hess, Arch. fur. Naturg., 1865, p. 129, pl. vi., f. 1. Haswell, Proc. Linn. Soc. N. S. Wales, iv., 1880, p. 434; and Cat. Austr. Crust., 1882, p. 6. Fulton & Grant, Proc. Roy. Soc. Vict., (n.s.), xix., 1906, p. 16.

Halimus truncatipes, Miers., Ann. Mag. Nat. Hist., (5), iv., 1879, p. 3. Fulton and Grant, *loc. cit.* Baker, Trans. Roy. Soc. S. Austr., xxix., 1905, p. 120, pl. xxii., fig. 2, 2^a.

Notwithstanding that both Fulton and Grant and Baker have reinstated *H. truncatipes*, Miers, as a distinct species, I am convinced that Haswell was right in including it in the synonymy of the above. Miers' short description fits *H. spinosus* exactly, as does Baker's figure and description.

This species is characterised by the tubercles of the carapace being obtusely pointed, and the lateral spines short and thick. The legs are short, and the propodus of each is thick, flattened, and truncate distally. This is the commonest species of the genus near Sydney.

(Since writing the above note I have received a letter from Mr. Baker, who kindly compared a Sydney specimen of this species with those he called *H. truncatipes*, and he agrees with me that there can be no doubt of the identity of the two.)

HALIMUS TUMIDUS, *Dana*.

Halimus tumidus (Dana), Baker, Trans. Roy. Soc. S. Austr., xxix., 1905, p. 121, pl. xxii., f. 3.

This species is closely allied to *H. spinosus*, but is readily recognised by the tubercles and lateral spines of the carapace being both shorter and blunter. The anterior orbital angle is less spiniform, and the basal antennal process is denticulate on its posterior border.

Several specimens from Moreton Bay, the largest measuring 32 mm.

HALIMUS LEVIS, *Haswell*.

Halimus levis (Haswell), Baker, Trans. Roy. Soc. S. Austr., xxix., 1905, p. 119, pl. xxi., f. 1, 1^a.

This is easily distinguished by the carapace being almost without tubercles, and the lateral spines long and sharp. The legs are long and slender, and the distal end of the propodi, though thickened, is far from truncate as in *H. spinosus*. The basal antennal spine is also much less prominent than in that species.

Five specimens from Port Phillip, and one measuring 48 mm. from Fremantle, Western Australia.

GABRIELIA, *gen. nov.*

Carapace broad; front prominent, almost horizontal or deflexed, more or less rounded and entire, and not distinct from the orbital angle. Orbits small, almost concealing the eyes from above; two sutures above and one below; the external angle inconspicuous and continuous with the antero-lateral margins. Antero-lateral borders long and arched, divided into obscure lobes. Basal antennal joint short, filling the orbital hiatus, and touching a downward process of the front; flagellum very short, lying in the orbit. Merus of external maxillipeds sub-quadrilateral. Fingers sharp-pointed. Abdomen of male consists of five movable pieces, of female seven.

Type.—*G. haswelli*, Fulton & Grant.

GABRIELIA HASWELLI, *Fulton & Grant*.

(Plate xii., figs. 5, 5^a.)

Cycloxanthus punctatus, Fulton & Grant, Proc. Roy. Soc. Vict., xix., (n.s.), 1906, p. 6, pl. iii. (*nec* Haswell).

Lioxantho haswelli, Fulton & Grant, *loc. cit.*

Length of carapace about three-quarters of the breadth. The regions which are scarcely elevated are moderately well defined by narrow grooves; anterior parts with scattered punctations, smooth posteriorly. Front very obtusely pointed, almost rounded, a little less than half the width of the carapace. Antero-lateral borders a little arched, and divided into four obscure lobes, of which the first is the longest and least distinct. Postero-lateral borders much constricted behind the last antero-lateral lobe, thence straight and strongly convergent. Sternum

and abdomen pitted; the other under-surfaces smooth. Orbits with two sutures above and another below; the lower borders minutely granular internally.

Eyes small, with a small sub-apical tubercle.

External maxillipeds flat and a little pitted, with a shallow somewhat oblique groove on the ischium. Ischium much longer than broad, and about twice as long as the merus. Outer angle of merus very slightly produced, flagellum attached to antero-internal angle. Exopod long and broad.

Chelipeds equal (?) (left cheliped missing in the young specimen, but in a specimen twice as big, and others bigger, left and right are equal in size). Right cheliped a little pitted and roughened exteriorly, smooth internally. Arm trigonal, with a few tubercles on the upper margin distally. Wrist with an internal tubercle, and another faint one below it. The upper border of the hand forms a crest, and the lower is carinate, more especially anteriorly. Fingers each with four stout teeth on their inner borders, which meet along their whole length and cross at the tips; mobile finger also with a crest.

Ambulatory legs a little punctate, and with indications of crests on the anterior and posterior margins of the joints. Dactyli dilated behind and with a curved ridge on either side.

Colour whitish, with light red patches. Length, 6.2 mm.; breadth, 8 mm.

For purposes of comparison with the next species a young specimen was selected for the basis of the above description.

The adult specimens I have examined, including a co-type, differ from the above description in having the front relatively narrower, it being about 2.6 in the breadth of the carapace, owing to the expansion of the branchial regions; in Fulton and Grant's figure the front is shown as very much too wide. The inter-regional grooves are more distinct, and the surface of the carapace, abdomen, chelipeds and legs is almost quite smooth, the punctations being nearly obsolete. The crests on the chelipeds and legs are absent, and the dactyli are long and cylindrical.

Colour, light brick-red, with some white marbling on the hinder part of the carapace.

Fulton and Grant supposed this species to be identical with *Cycloxanthus punctatus*, Haswell, and for reasons given proposed the new name *haswelli* for it. This supposition was incorrect, but as they distinctly applied the name to the Victorian species,

it can be properly used here. They recognised, however, that it could not enter the genus *Cycloxanthus*, A. M. Edw. (= *Cycloxanthops*, Rathb.) and transferred it to *Lioxantho*, Alcock. I fail to see that it has any relationship here, and being unable to refer it to any other known genus, propose a new one, *Gabrielia* (*ante*) for its reception, together with *Cycloxanthus punctatus*, Hasw., and *C. carinatus*, Baker.

Port Phillip, Victoria. Dredged by Mr. J. Gabriel.

GABRIELIA PUNCTATA, *Haswell*.

(Plate xii., fig. 4.)

Cycloxanthus punctatus, Haswell, Proc. Linn. Soc. N. S. Wales, vi., 1882, p. 752; and Cat. Austr. Crust., 1882, p. 50.

Length of carapace about three-quarters of the breadth. The regions are somewhat elevated, and the summits of either gastric and epibranchial regions surmounted by a tuberculiform eminence; inter-regional grooves deep and smooth. Scattered punctations or pits on the anterior half of the carapace, becoming very numerous behind. Front broadly rounded, equal to one-half the width of the body, and its upper surface somewhat concave. Antero-lateral borders strongly arched and divided into four rather obscure lobes; the first is the longest and least distinct, and the second forms a hepatic angle. Postero-lateral borders almost straight, strongly convergent. Under-surfaces of the carapace and abdomen closely pitted everywhere, with the exception of the front and sub-branchial portions. Orbits with two indistinct sutures above, and a very indistinct one below; lower borders minutely granular.

Eyes smaller than in *G. haswelli*, with a small subapical tubercle.

External maxillipeds similar to that species, but much more densely pitted.

Chelipeds unequal; the larger closely pitted on all its outer surfaces, and smooth internally. Arm trigonal, its upper margin denticulate. Wrist with an internal tubercle and a second smaller one below it. Hand with a prominent crest on its upper border, and a weaker one below, which is more pronounced on the immobile finger; also some indication of ridges on the outer surface. Fingers each with four stout teeth on their inner borders, which meet along their whole length and cross at the tips; mobile finger also crested. Smaller cheliped similar to the larger, though smoother.

Ambulatory legs deeply pitted all over; all the joints with distinct crests on the front and hinder margins. Dactyli expanded behind with a curved ridge on either side.

Colour, quite white all over. Length, 8.3 mm.; breadth, 10.8 mm.

I have compared this specimen with the type in the Macleay Museum, which is about the same size, and there can, therefore, be no doubt of its correct identification. The adult form is unknown.

Coogee Bay, near Sydney, after a storm.

GABRIELIA CARINATA, *Baker*.

Cycloxanthus ? *carinatus*, Baker, Trans. Roy. Soc. S. Austr., xxxi., 1907, p. 173, pl. xxiii., f. 1.

Through the kindness of Mr. Baker, I have received a fine specimen of this species from Port Lincoln, South Australia. I agree with him that it is easily distinguished from the other two species by its nearly horizontal front, and the thin cristate antero-lateral margins.

In these two characters it approaches *Cycloxanthops*, and shows the close relationship of *Gabrielia* to that genus, but the arched front lacking a median notch is quite sufficient to distinguish the two. I may add here that it is the only one of the three species which has any trace of the notch near the inner orbital angles which is so characteristic of *Cycloxanthops*.

EURYCARCINUS MACULATUS, *A. M. Edw.*

Eurycarcinus maculatus (A. M. Edw.), De Man, Journ. Linn. Soc., Zool., xxii., 1888, p. 44, pl. ii., figs. 2-3. Ortmann, Zool. Jahrb., vii., 1894, p. 435.

Actumnus nudus, Grant & McCulloch, Proc. Linn. Soc. N. S. Wales, xxxi., 1906, p. 17 (*nec* A. M. Edw.).

Owing to the numbers at the foot of De Man's plate being transposed, we have wrongly recorded this species from Port Curtis as *Actumnus nudus*. Specimens from Moreton Bay agree perfectly with his figure, and it has also been recorded by Ortmann from East Australia. *Actumnus nudus* does not, so far as I am aware, occur in Australia.

EUCRATE HAMILTONI, *sp. nov.*

(Plate xii., figs. 1, 1a.)

Carapace smooth, and, with the exception of the cardiac, with very slight indication of the regions; convex fore and aft, and a little also from side to side; the length 1.2 in the breadth. Front nearly straight, with a median notch, its anterior face sulcate, and the lower margin with two mesial lobes, which project so as to be visible from above; the width 3.8 in that of the body. Orbits equalling one-half the front, their superior angles well defined, the exterior indistinct; the upper borders with two sutures, the lower with a blunt lobe internally, followed by a second smaller one; a small hiatus at the exterior angle.

Antero-lateral borders arched and clearly defined only anteriorly, their even curve is scarcely broken by two very indistinct nodules. A faintly indicated ridge extends inwards and backwards from the sides behind the second nodule, and at its base a similar one trends forwards again. There are a few punctations near the margins on the anterior portions of the carapace. Post-lateral margins distinct in their hinder portions; the sides extending outwards.

Pterygostomial regions anteriorly bordered with thick felted hairs. A prominent ridge crosses its hinder portion, which is minutely granular, and with or without long hairs.

Basal joint of the antennæ with a process into the inner orbital hiatus, which excludes the flagellum from the orbit.

Ischium of external maxillipeds with a longitudinal sulcus, and its inner border finely denticulate. Merus with a prominent outer angle, which makes it a little wider than the preceding joint, which is one and a half times its length; there are two curved grooves on its outer face.

Chelipeds unequal, the larger more than twice the length of the carapace, and longer than the legs. Arm with a large tubercle at the distal end, and another smaller one halfway along its length, the lower surface with minute scattered granules. Wrist with a strong inner tooth, and its anterior margins clothed with a dense felted pubescence. Hands massive, with a strong external tooth between the fingers, and a blunt ridge near the lower anterior border. Fingers crossing when closed, strongly toothed, and those of the larger hand with the distal half gaping.

Ambulatory legs smooth, the carpal joints with a few hairs distally. Propodi and dactyli each with eight rows of puncta-

tions or cilia, three on both upper and lower borders, and one down the middle on either side. These joints are more compressed and broader in the last pair than in the preceding ones.

Ground colour yellow, but the anterior half of the carapace, the arms, wrists, and upper parts of the hands closely covered with red dots, which give them a pink colour. A large heart-shaped carmine spot on the middle of the back. Lower half of the hand white. On the legs the red dots combine to form a darker shade.

This species is very similar to *E. crenata*, de Haan, but the absence of teeth on the antero-lateral borders at once distinguishes it. With further material, it may prove that this is but the adult form of one of the other species known from the Queensland coast, but for the present it is deemed best to figure it under a new name.

Moreton Bay, Queensland, in shallow water. Three specimens; the largest being 53 mm. and the smallest 46 mm. wide; collected by Mr. W. Hamilton, after whom the species is named.

TRIGONOPLAX UNGUIFORMIS, de Haan, var. LONGIROSTRIS, var. nov.

(Plate xii., fig. 3.)

Elamena (Trigonoplax) unguiformis (de Haan), Fulton & Grant, Proc. Roy. Soc. Vict., (n.s.), xix., 1906, p. 10, fig.

I have compared four specimens of this southern form, including one from Mr. Grant's collection, with a specimen of *T. unguiformis* from Japan. They differ from it in having the length of the body equal to its width, and the front much longer and differently shaped. The dactyli of the ambulatory legs also appear to be much broader. Though I think it probable that an examination of further specimens will show these characters to be constant, and therefore of specific value, I prefer for the present to regard them under a varietal name only.

Length of specimen figured (a female), 15 mm.

Port Phillip, Victoria.

ANICULUS ANICULUS, Fabricius.

Aniculus aniculus (Fabricius), Alcock, Cat. Ind. Dec. Crust., pt. II., fas. I., 1905, p. 94, pl. vii., f. 6.

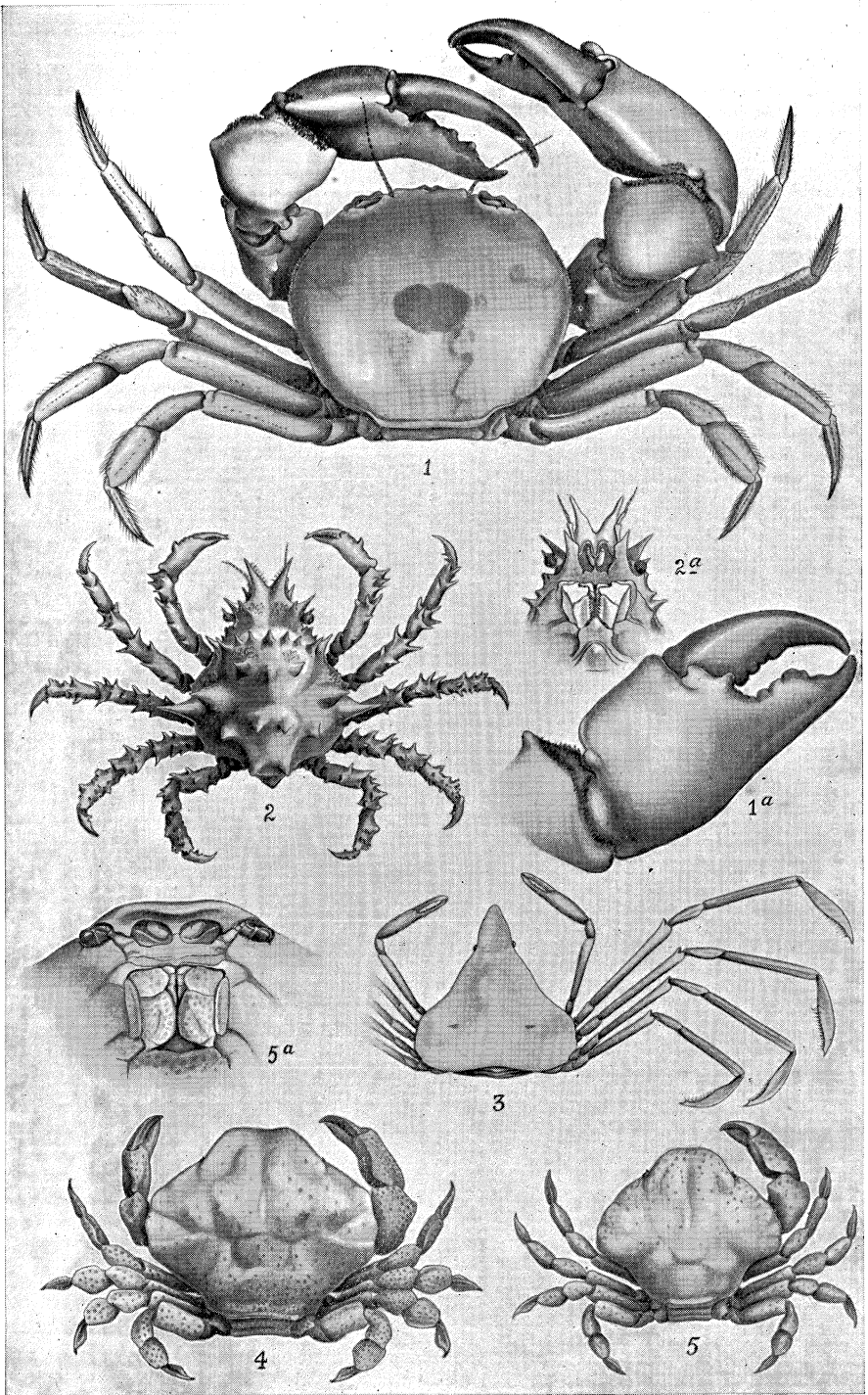
A large specimen from Moreton Bay agrees perfectly with the above figure and description.

EXPLANATION OF PLATE XII.

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AUSTRALIAN CRUSTACEA.

- Fig. 1. *Eucrate hamiltoni*, McCulloch.
,, 1a. ,, ,, larger cheliped.
,, 2. *Hoplophrys ogilbyi*, McCulloch.
,, 2a. ,, ,, mouth parts, etc.
,, 3. *Trigonopanax unguiformis*, var. *longirostris*, var. nov.
,, 4. *Gabriella punctata*, Haswell.
,, 5. ,, *haswelli*, Fulton & Grant.
,, 5a. ,, ,, mouth parts, etc.

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Figs. 1, 1a. reduced, the others much enlarged.



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