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6 College Street, Sydney NSW 2010, Australia



# STUDIES IN AUSTRALIAN CARCINOLOGY.

No. 1.

BY

FRANK A. MCNEILL, Assistant in Zoology, Australian Museum.

(Plate xix., and Figures 1-5.)

The following paper deals with *Uca marionis*, and extends the known range of several other Australian crustaceans. The former is represented in the Australian Museum collection by several large series of specimens, which afford an opportunity to give a few notes on the variation and characters of the species. For assistance in the formation of the paper I am indebted to Mr. A. R. McCulloch, whose tuition in the past has laid the foundation of my work.

## Family OCYPODIDÆ.

*UCA*, Leach.

*UCA MARIONIS*, Desmarest.

(Plate xix., and Figures 1-5.)

*Gelasimus marionis*, Desmarest, Consid. Gen. Crust., 1825, p. 124, pl. xiii., fig. 1. *Id.*, Milne Edwards, Ann. Sci. Nat., Zool. (3), xviii., 1852, p. 145, pl. iii., fig. 5. *Id.*, Kingsley, Proc. Acad. Nat. Sci. Philad., 1880, p. 141, pl. ix., fig. 8. *Id.*, Alcock, Journ. Asiat. Soc. Beng. (n.s.), lxix. 2, 1900, p. 359. *Id.*, De Man, Abh. Senck. naturf. Ges., xxv. 3, 1902, p. 487.

*Gelasimus vocans*, Milne Edwards (part), Ann. Sci. Nat., Zool. (3), xviii., 1852, p. 145, pl. iii., fig. 4. *Id.*, Haswell, Cat. Austr. Crust., 1882, p. 92. *Id.*, De Man, Notes Leyden Museum, xiii., 1891, p. 23, pl. ii., fig. 5.

*Gelasimus nitidus*, Dana, U.S. Expl. Expd., Crust., part 1, 1852, p. 316, pl. xix., figs. 5a-d.

*Gelasimus cultrimanus*, Kingsley, Proc. Acad. Nat. Sci. Philad., 1880, p. 140, pl. ix., fig. 7.

*Gelasimus vocans*, var. *cultrimanus*, De Man, Notes Leyden Museum, xiii., 1891, p. 24, pl. ii., fig. 5a.

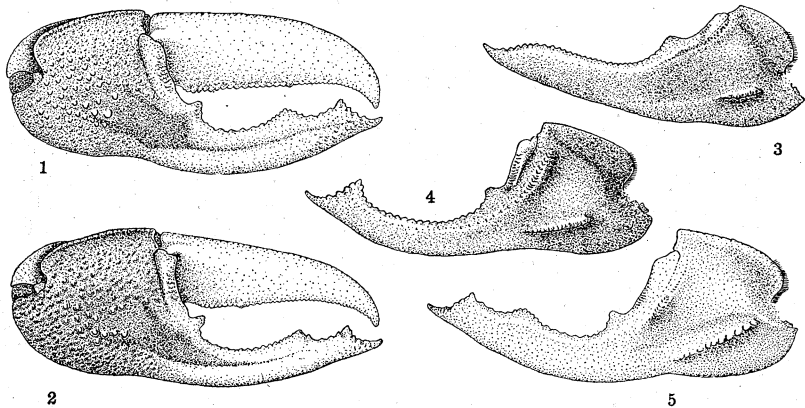
Hess<sup>1</sup> has incorrectly recorded *Gelasimus signatus* and *G. variatus* (= *tetragonon*) from Sydney, but no species of the genus is known to occur so far south as Port Jackson. I am now able to record the presence of *Uca* in New South Wales' waters, however, a fine series of *U. marionis* having been recently collected by Mr. J. R. Kinghorn on a lagoon mud-flat near South West Rocks, Trial Bay.

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<sup>1</sup> Hess—Arch. Naturg., xxxi. i., 1865, p. 146.

*Variation.*—A splendid series of 150 male specimens in the Australian Museum collection exhibits a remarkable range of variation in the form of the larger hand, which is illustrated in the accompanying figures. They include the typical *marionis* form as illustrated by Desmarest, Milne Edwards, and Kingsley; the var. *nitida* form as figured by Dana, and the forms illustrated in figs. 5 and 5a of De Man as *G. vocans* and *G. vocans* var. *cultrimanus*, and also similar variation to that described by the latter author in 1902 (*vide supra*). The intermediate stage between *marionis* and var. *nitida*, as figured by Milne Edwards, is not represented in our collection, but an additional variety, which I propose to call *vomeris*, is represented by many specimens from Australia.

*Uca marionis*, var. *typica* (Plate xix., and Fig. 3).—In this variety the movable finger is very blade-like, and is subequally toothed along the whole of its inner edge. It is more delicate and slender in some specimens than in others, and is, sometimes nearly straight along its cutting edge. The immovable finger is scarcely excavate and there are no angular projections anteriorly, but a broad low one occurs near the base; the cutting edge forms a shallow sinuous curve. The crests on the inner surface of the palm are not so prominent as those in the other varieties;



Figs. 1 and 2. Chelæ of adult males of var. *nitida*, from Fiji.

Fig. 3. Inner surface of palm of adult male of var. *typica* from the Endeavour River estuary at Cooktown, Queensland; same specimen as Fig. 10, on Plate xix.

Fig. 4. Inner surface of palm of adult male of var. *vomeris*, from Trial Bay, New South Wales; same specimen as Figs. 1-3 on Plate xix.

Fig. 5. Inner surface of palm of adult male of var. *nitida*, from Fiji; same specimen as text fig 1.

there is a short clearly defined one on the lower surface of the palm, and another near the base of the immovable finger which is irregular in form. This may be obscurely divided into two in some specimens, while in others the two merge to form a low, wide ridge of granules; in others again, this ridge is obsolete.

*Uca marionis*, var. *vomeris*, var. nov. (Plate xix., and Fig. 4).—Intermediate between var. *typica* and var. *nitida* is a form common in sub-tropical Australia. In this the base of the immovable finger is armed with a small

acute lobe, which is more pronounced in some specimens than in others, and the distal portion becomes elevated into a large angular lobe. The cutting edge of the finger is generally more or less deeply excavate, though it may be nearly straight, particularly in the younger stages. The mobile finger is less blade-like than in var. *typica*; it is provided with one or two enlarged denticles which are variable in position, there being either one in the middle of the finger-length, or one on the proximal or distal half, or on both. A set of slightly enlarged denticles may also occur at the base. The crest on the lower inner surface of the palm is long and very prominent, and there are two well differentiated ones at the base of the immovable finger.

*Uca marionis*, var. *vocans* M. Edw. (*nec*. Linn).—Milne Edwards has figured a male chela, which is intermediate between that of var. *vomeris* and var. *nitida*, in which the inner edge of the immovable finger tends to form a median projection and thereby approaches the form of var. *nitida*.

*Uca marionis*, var. *nitida*, Dana (Figs. 1, 2 and 5).—In this form the immovable finger is armed with the usual proximal angular lobe; there are also two prominent angular projections, one distal in position, while the other is either submedian or in the distal half of the finger. The movable finger is usually rather thickened and curved, and is provided with one or more enlarged denticles which vary, as in var. *vomeris*; a series of enlarged denticles may also occur at the base. The two well defined inner crests of the palm are very prominent, the third is either very small or is obsolete.

Though these variations differ so considerably from the typical form, the series before me includes most of the intermediate stages connecting one with another, while the fact that two forms, such as var. *typica* and var. *vomeris*, and var. *typica* and var. *nitida*, are represented in collections from circumscribed areas convinces me that they are all referable to the one species.

*Localities*.—Trial Bay, New South Wales; coll. J. R. Kinghorn, Jan. 1920—var. *vomeris* and stages intermediate between var. *vomeris* and var. *typica*.

Brisbane River, Queensland—adult male (large hand missing).

Fraser Island, Queensland—var. *vomeris*.

Endeavour River estuary at Cooktown, Queensland; coll. A. R. McCulloch, June, 1918—var. *typica*, var. *vomeris*, and stages intermediate between the two.

Kollan Island, King Sound, North-west Australia; coll. Dr. H. Basedow, 1916—var. *vomeris*, and stages intermediate between var. *vomeris* and var. *typica*.

Oubatche, New Caledonia—var. *nitida*.

Port Moresby, New Guinea—var. *nitida*.

New Hebrides—var. *nitida*, and stage intermediate between var. *vomeris* and var. *typica*.

Solomon Islands—var. *nitida* and stages intermediate between var. *vomeris* and var. *typica*.

Fiji—var. *typica* and var. *nitida*.

Andaman Islands, Indian Ocean—var. *nitida*.

Family XANTHIDÆ.

Sub-family MENIPPINÆ.

PSEUDOCARCINUS, *Milne Edwards*.

PSEUDOCARCINUS GIGAS, *Lamarck*.

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

*Pseudocarcinus gigas*, M. Edw., Hist. Nat. Crust., i., 1834, p. 409. *Id.*, Haswell, Cat. Austr. Crust., 1882, p. 52. *Id.*, Miers, Chall. Rept., Zool., xvii., 1886, p. 141 footnote. *Id.*, Whitelegge, Proc. Roy. Soc. N.S.Wales, xxiii., 2, 1889, p. 227. *Id.*, McCoy, Prodr. Zool. Vict., Dec. xviii., 1889, p. 293, pls. clxxix. and clxxx.

The recent acquisition of a specimen enables me to definitely record *Pseudocarcinus gigas* from New South Wales' waters. Furthermore, Mr. A. R. McCulloch has supplied me with some notes made by him in the early part of 1914, whilst on the Federal Trawler "Endeavour," on the colouration and occurrence of the species.

*Colouration*.—While the "Endeavour" was trawling eastward of Babel Island, Bass Strait, in 60-100 fathoms, each haul of the net brought up one or more of this species. Their colouration varied from a beautiful red and white reticulate pattern to a deep red, but the variation was not connected with either sex or age. The comparison of differently marked specimens failed to reveal any structural differences.

*Occurrence*.—Some medium sized examples were found inside large sponges, while a very small specimen, little more than one inch across the carapace, together with another a little larger, was taken out of a large sponge cavity.

*Measurements*.—According to Haswell, the carapace of this species is sometimes two feet in breadth, but I am unable to find any record of specimens attaining that width. The largest specimen in the Australian Museum measures 326 mm. across the carapace at its greatest breadth, and the hand is 442 mm. long from the postero-inferior angle of the palm to the tip of the immovable finger; its weight when fresh was twenty pounds. Another large example in the Tasmanian Museum, Hobart, is about 13 inches (330 mm.) across the carapace, and the hand is about  $17\frac{1}{4}$  inches (438 mm.) in length, measured as above.

*Locality*.—According to Lamarck, this species was collected in Port Jackson, New South Wales, by Péron and Lesueur, while Whitelegge, on the authority of Trebeck, has included it in a Port Jackson list from the Lane Cove River. We now know the species to be an inhabitant of moderately deep water, and it only ascends to lesser depths in southern latitudes.

It therefore appears to be improbable that any specimen has been taken within the limits of Port Jackson. I am able to definitely record the species from New South Wales' waters, however, a carapace 262 mm. wide and two chelæ having been presented to the Australian Museum by Mr. D. G. Stead, which were secured near the Five Islands, off Wollongong, in 75 fathoms.

Family INACHIDÆ.

Sub-family INACHINÆ.

EPHIPPIAS, *Rathbun*.

EPHIPPIAS ENDEAVOURI, *Rathbun*.

*Ephippias endeavouri*, Rathbun, Biol. Res. "Endeavour," v. 1, 1918, p. 9, pl. xv.

*Variation*.—A male specimen, 105 mm. long from the tip of the rostral spines to the end of the posterior tubercle of the carapace, differs from the holotype in being much less massive. The rostral spines are proportionately slightly longer and are more divergent. The chelæ are much more slender in proportion and the fingers weaker.

*Locality*.—This specimen was taken by the State Trawlers in about 60 fathoms, off Botany Bay, New South Wales. The species has hitherto only been recorded from south of Kangaroo Island, Investigator Strait, South Australia.

Family GRAPSIDÆ.

Sub-family SESARMINÆ.

HELICE, *de Haan*.

HELICE LEACHII, *Hess*.

*Helice leachii*, Hess, Arch. Naturg., xxxi. i., 1865, p. 153. *Id.*, De Man, Zool. Jahrb., Syst., ii., 1887, pp. 690, 702. *Id.*, Rathbun, Mem. Mus. Comp. Zool., xxxv. 2, 1907, p. 36.

*Helice pilimana*, A. M.-Edw., Nouv. Arch. Mus. Hist. Nat., ix., 1873, p. 313, pl. xviii., figs. 1 a-c.

This species was originally described from Port Jackson by Hess, but it has not since been recognised from this locality. There is, however, a single specimen in the Australian Museum collection which agrees with De Man's description of the typical example. This was collected in Mosman Bay, Port Jackson, New South Wales, by Mr. Thomas Whitelegge. Further, a fine series of specimens was collected in January, 1920, by Mr. J. R. Kinghorn at Trial Bay, New South Wales, on a mangrove mud flat. All of these specimens agree with those recorded by Miss Rathbun from Japan in having the longitudinal ridge on the lower outer surface of the palm less prominent, and the patch of fur at the base of the fingers less extensive than is shown in A. Milne Edwards' figure of *H. pilimana*.

EXPLANATION OF PLATE XIX.

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- Fig. 1. *Uca marionis*, Desm., var. *vomeris*, var. nov. An adult male, 26 mm. wide at the outer angles of the orbits, from Trial Bay, New South Wales.
- „ 2. Front and orbits of the same specimen as Fig. 1.
- „ 3. Chela of the same specimen as Fig. 1.
- „ 4. Chela of an adult male of var. *vomeris*, from Trial Bay, New South Wales.
- „ 5. Chela of an adult male of var. *vomeris*, from Trial Bay, New South Wales.
- „ 6. Chela of a half grown male of var. *vomeris*, from the Endeavour River estuary at Cooktown, Queensland.
- „ 7. Chela of an adult male, intermediate between var. *vomeris* and var. *typica*, from the Solomon Islands.
- „ 8. Chela of an adult male, intermediate between var. *vomeris* and var. *typica*, from Trial Bay, New South Wales.
- „ 9. Chela of an adult male, intermediate between var. *vomeris* and var. *typica*, from Trial Bay, New South Wales.
- „ 10. Chela of an adult male of var. *typica*, from the Endeavour River estuary at Cooktown, Queensland.
- „ 11. Chela of an adult male of var. *typica*, from Fiji.

