

GRIFFIN, 1963

16^{1/2}

J. MARTIN

TRANSACTIONS
OF THE
ROYAL SOCIETY OF NEW ZEALAND

ZOOLOGY

VOL. 3

NO. 22

OCTOBER 11, 1963

Notomithrax gen. nov. and the Status of the Genus
Paramithrax H. Milne Edwards
(Crustacea, Brachyura, Majidae)

By D. J. G. GRIFFIN¹

Department of Zoology, Victoria University of Wellington

[Received by the Editor, April 17, 1963.]

Abstract

Six species of majid spider crab formerly placed in the genus *Paramithrax* H. Milne Edwards, 1834, are removed to a new genus, *Notomithrax*, *Paramithrax peronii* H. M. Edw. being designated type species. The genera *Lobophrys* Filhol, 1885, and *Gonatorhynchus* Haswell, 1880, are reduced to synonymy with *Paramithrax* s.s. which is restricted to include a single Australian species, *Paramithrax barbicornis* (Latreille), most widely known as *Gonatorhynchus tumidus* Haswell. Diagnoses of *Notomithrax* and *Paramithrax*, and a key to the species of the former, are given. *Paramithrax parvispinosus* Ward is transferred to the genus *Leptomithrax* Miers.

INTRODUCTION

THE genus *Paramithrax* was established by H. Milne Edwards (1834) to include three species of majid spider crab, *Pisa barbicornis* Latreille, 1825, *Paramithrax peronii* n.sp. and *Paramithrax gaimardii* n.sp. The genus was divided by Milne Edwards into two sections, one containing the Australian *P. barbicornis* and the "Indian Ocean" *P. peronii*, and the other *P. gaimardii*, a supposedly New Zealand species. The descriptions of all three were very brief and no type species was specified for the genus. Miers (1876a, 1876b) subdivided Milne Edwards's genus into two subgenera, the name *Paramithrax* being restricted to the first section and a new name, *Leptomithrax*, being proposed for the second. *P. peronii* was designated type species of the former, and the New Zealand *P. (L.) longimanus* Miers, 1876, of the latter, by Miers (1879b). These subgenera, different in both content and definition from the two sections of the genus proposed originally by Milne Edwards, were each eventually raised to full generic status by Rathbun (1918). By that time six more species of *Paramithrax* (*Paramithrax*) had been described: four, *P. latreillei* Miers, 1876 (syn. *P. cristatus* Filhol, 1885), *P. minor* Filhol, 1885, *P. longipes* Thomson, 1902, and *P. parvus* Borradaile, 1916, from New Zealand; one, *P. spinosus* Miers, 1879, from Norfolk Island; and one, *P. baekstroemi* Balss, 1924 (syn. *P. peroni* Lenz, 1902, not *P. peronii* M. Edw.), from Juan Fernandez, off the coast of Chile. Another species, *P. parvispinosus*

¹ Present address: Zoology Department, University of Tasmania, Australia.

Ward, 1933, from Australia, was added fifteen years later. It should be noted here that in the present paper the Australian species, *Paramithrax spatulifer* and *P. coppingeri*, both described by Haswell (1882a and 1882b respectively) are not referable to *Paramithrax* but either to the genus *Acanthophrys* A. Milne Edwards or *Chlorinoides* Haswell and should not be confused with the group of species dealt with in the present paper.

In 1880 Haswell (1880) described and figured *Gonatorhynchus tumidus*, a new genus and species of majid crab from Australia. Later workers had no difficulty in recognising this species, and the name became well established in the Australian literature. Balss's (1929) important revision of the majid Oxyrhyncha included two main points of interest relevant to the present account. Firstly, he was able to show that *Paramithrax barbicornis* and *Gonatorhynchus tumidus* were conspecific, the holotype of the former being figured for the first time. Prior to 1876 it had been assumed that *P. barbicornis* occurred in New Zealand as well as Australia. However, both Miers (1876a, 1876b) and Filhol (1885, 1886) considered that *P. barbicornis* (Latreille) was not part of the New Zealand fauna, but that the New Zealand form, previously called by that name, was specifically distinct. Miers gave this species the name *Paramithrax latreillei* and Filhol *Paramithrax cristatus*. The latter author went further than Miers in that he created a new genus for Latreille's species, *Lobophrys*. Balss followed Filhol in this regard, and the species *barbicornis* Latreille was retained in Haswell's *Gonatorhynchus*. Between 1886 and 1929, species *barbicornis* received no mention in the literature. Balss therefore brought to light the identity of a previously obscure species. Secondly, Balss reduced *Paramithrax latreillei* Miers to synonymy with a very old species, *Cancer ursus* Herbst, 1788, retained it within *Paramithrax*, and recorded it from Australia for the first time. Unfortunately, these decisions of Balss seem to have been overlooked by later workers, *P. ursus* being recorded from Australia for the second time as *P. latreillei* by McNeill (1953), and the latter name has also appeared in recent New Zealand literature (see Richardson, 1949; Dell, 1960).

Thus, of the ten species referred to *Paramithrax* (*Paramithrax*) since its inception, one, *P. barbicornis*, has been transferred to *Gonatorhynchus* Haswell, one, *P. longipes* Thomson, has been regarded as belonging to the genus *Leptomithrax* Miers by most recent workers such as Richardson (1949) and Dell (1960), while one other, *P. gaimardii* H. Milne Edwards, is now also considered to be a species of *Leptomithrax*, and is almost certainly restricted to Australia (see Griffin, in press). This leaves a group of seven species inhabiting intertidal and shallow offshore waters, six of which are restricted to the Australasian region, *P. peronii* and *P. minor* having been recorded from Australia on several occasions (Haswell, 1882c; Hodgson, 1902; Fulton and Grant, 1906; Rathbun, 1918) and *P. ursus* on two, as noted above; there is a distinct possibility that the locality given by H. Milne Edwards (1834) for *P. peronii*—viz., Indian Ocean, is a mistake for New Zealand. At least two species, *P. parvus* and *P. parvispinosus*, are very poorly known, each having been described only once and then from but a single small specimen. Miers's (1879b) designation of *P. peronii* H. Milne Edwards as the type species of *Paramithrax* has been widely accepted up to the present. This, then is the current concept of the genus *Paramithrax* H. Milne Edwards, 1834, as included, for instance, by Balss (1957: 1628) in the list of the genera of Oxyrhyncha of the World.

The need for the present note stems from the statement by Ward (1933: 392) that the type species of *Paramithrax* is *P. barbicornis* (Latreille), having been so designated by Desmarest (1858: 14). I quote here Desmarest's own words:

"*Paramithrax* Edw.: groupe ne renfermant qu'un petit nombre d'espèces particulière à l'Australasie, et dont le type est la *Pisa barbicornis* Latreille."

Dr John S. Garth and Dr L. B. Holthuis (pers. comm.) have both confirmed the validity of this type designation by Desmarest. Clearly, therefore, the species *barbicornis* of Latreille must be included in *Paramithrax*, and the genera *Lobophrys* Filhol and *Gonatorhynchus* Haswell thereby become junior objective synonyms of it. Miers's designation of *P. peronii* as the type species of *Paramithrax* must, on the other hand, be regarded as invalid. This procedure raises some complications for, as already noted in this paper, *P. barbicornis* has been considered, by Filhol and by Balss, to be generically distinct from all the other species placed in *Paramithrax* by Milne Edwards, Miers, and later workers. If Filhol and Balss are correct in this view then a new genus is required for those species.

Consideration of the problems introduced above was made practically possible by examination of a specimen of *P. barbicornis* sent, by kind permission of Dr J. W. Evans, Director of the Australian Museum, Sydney, by Mr F. A. McNeill, the then Curator of Crustacea. Specimens of three of the New Zealand species of *Paramithrax* s.l., *P. peronii*, *P. minor* and *P. ursus*, have also been examined. The remainder of the present paper is devoted to the setting up and definition of a new genus, a redefinition of *Paramithrax* s.s., and a discussion of the several points outlined above. Finally, the systematic position of *Paramithrax parvispinosus* Ward is considered following re-examination of the type specimen. The terminology used follows Rathbun (1925) and Garth (1958).

SYSTEMATICS

Family MAJIDAE Samouelle, 1819

Subfamily MAJINAE Alcock, 1895; restricted Balss, 1929

Genus NOTOMITHRAX gen. nov.

Paramithrax H. Milne Edwards, 1834: 323 (part: *P. peronii* H. Milne Edwards, 1834). Miers, 1876a: 219 (subgenus *Paramithrax* part); 1876b: 5 (part); 1879b: 655. Haswell, 1882c: 12 (part). Rathbun, 1893: 66 (part); 1918: 17; 1925: 338. Alcock, 1895: 240 (part). Balss, 1929: 18. Richardson, 1949: 65 (in key). Garth, 1958: 344.

DIAGNOSIS: Carapace pyriform, densely tuberculated or spinous dorsally. Rostrum of two divergent spines separate from their base. Orbit consisting above of a broad, laterally rounded supraorbital eave with a prominent spine at posterolateral corner, anterolateral corner sometimes also produced into a small spine; an intercalated spine, and a long, conical, postorbital spine remote from orbit; eave, intercalated spine and postorbital spine separated by wide, deep fissures. Eyestalks slender, never reaching postorbital spine, cornea small, terminal. Basal antennal article broad, subrectangular, of even width throughout, lateral edge not notched, anterolateral and anteromedial angles each produced into a well developed spine of which at least anteromedial is forwardly directed.

Merus of third maxilliped subquadrate, not greatly expanded laterally, deeply notched distally, a sharp, prominent spine at lateral angle of notch.

Chelipeds much longer than carapace in adult male, merus with a few spines or tubercles dorsally, carpus with two longitudinal ridges converging proximally, usually one dorsal and one obliquely crossing lateral surface; chela enlarged distally in male, fixed finger more or less strongly excavated basally, fingers thus gaping at bases.

Abdomen of seven distinct segments in both sexes. Male abdomen widest at middle of third segment; seventh segment subtriangular to subquadrate, basal width greatly exceeding length, distal edge weakly convex.

Male first pleopod slender, outwardly curved distally, tip finely pointed, setose; aperture located a short distance from tip, basal lip of aperture weakly expanded as a fleshy lobe.

RANGE: New Zealand, south-east Australia, Norfolk Island, extending eastward to Juan Fernandez off the coast of Chile.

Genus *PARAMITHRAX* H. Milne Edwards, 1834, restricted

Paramithrax H. Milne Edwards, 1834: 323 (part: *P. barbicornis* (Latreille, 1825)).
Desmarest, 1858: 14. Not *Paramithrax*, Miers 1879b: 656.

Gonatorhynchus Haswell, 1880: 437; type species by monotypy: *Gonatorhynchus tumidus* Haswell, 1880 (= *Pisa barbicornis* Latreille, 1825); 1882c: 10. Miers, 1886: 25. Balss, 1929: 17.

Lobophrys Filhol, 1885: 17; type species by monotypy: *Paramithrax barbicornis* (Latreille, 1825); 1886: 360.

DIAGNOSIS: Carapace pyriform, very weakly tuberculated dorsally. Rostrum of two spines fused for a short distance basally, lateral margins subparallel. Orbit consisting above of a narrow supraorbital cave, sharply angled anteriorly, a very small spine at posterolateral corner, an intercalated spine and a very short, conical postorbital spine not greatly removed from orbit; cave, intercalated spine and postorbital spine separated by narrow, deep fissures. Eyestalks slender, reaching to intercalated spine when retracted, cornea small, obliquely ventral. Basal antennal article large, wide posteriorly, narrowing anteriorly, lateral edge notched close to anterolateral angle, which is laterally produced as a small, flattened, blunt lobe, anteromedial angle bearing a short, conical, downwardly curved spine.

Merus of third maxilliped subquadrate, greatly expanded laterally, deeply notched distally, a very small spinule at lateral angle of notch.

Chelipeds not much longer than carapace, lacking spines or tubercles, carpus with a strong longitudinal ridge obliquely crossing lateral surface; chela enlarged midway along its length in adult male, narrowing distally; fixed finger excavated at base, fingers gaping proximally.

Abdomen of seven distinct segments in both sexes. Male abdomen widest at middle of third segment; seventh segment subtriangular, basal width scarcely exceeding length, apex distal, rounded.

Male first pleopod slender, outwardly curved distally, tip blunt, setose; aperture terminal, medial surface expanded distally to fill groove formed by curved lateral surface.

RANGE: South and south-east Australia.

TYPE SPECIES: *Pisa barbicornis* Latreille, 1825, by subsequent designation of Desmarest (1858: 14).

REMARKS: The genus is here restricted to include only the type species, *Paramithrax barbicornis* (Latreille), as already noted above. For descriptions and figures of this species see Haswell (1880: 437, Pl. 25, fig. 4, as *G. tumidus*), McCulloch (1913: 335, fig. 46, as *G. tumidus*) Balss (1929: 17, Pl. 1, fig. 4, as *G. barbicornis*) and Griffin (in press).

As there has in the past been some considerable disagreement over the limits of the genera *Notomithrax* (under the name *Paramithrax*) and *Leptomithrax* Miers, the present section is concluded with a key to these two genera and to *Paramithrax* s.s.

KEY TO THE MAJINE GENERA *Paramithrax* s.s., *Notomithrax* AND *Leptomithrax*

- 1 (2) Rostral spines fused for a short distance basally, lateral margins subparallel. Supraorbital cave bearing posterolaterally a very small spine, intercalated and postorbital spines subequal in length. Carapace very sparsely tuberculated dorsally. Basal antennal article broad posteriorly, narrowing anteriorly, lateral edge notched close to blunt anterolateral angle. Cheliped lacking tubercles or spines, carpus with a blunt oblique ridge laterally
- 2 (1) Rostral spines separate from base, widely divergent. Supraorbital cave bearing a prominent spine posterolaterally, postorbital spine much longer than intercalated spine. Carapace generally densely tuberculated or spinous dorsally. Basal antennal article of almost even width throughout, not notched laterally, anterolateral angle a prominent spine or flattened lobe. Cheliped with or without tubercles or spines, carpus ridged or sub-cylindrical.

Paramithrax H. M. Edw.,
s.s.

- 3 (4) Three parts of supraorbital margin (eave, intercalated spine and postorbital spine) widely separated; postorbital spine conical, lacking hairs anteriorly. Eyestalk slender, seldom reaching postorbital spine, cornea small. Cheliped sparsely tuberculated or spinous, carpus with two longitudinal ridges converging proximally, one dorsal and one lateral, oblique *Notomithrax* n.gen.
- 4 (3) Three parts of supraorbital margin closely approximated; postorbital spine dorsoventrally flattened, excavated anteriorly to form a "cup", margin of cup fringed by hairs. Eyestalk stout, reaching almost to postorbital spine, cornea very large. Cheliped usually densely tuberculated or spinous, carpus lacking a dorsal longitudinal ridge, a poorly developed lateral ridge sometimes present *Leptomithrax* Miers

DISCUSSION AND CONCLUSIONS

From a comparative examination of *Paramithrax barbicornis* and the other species included, up to the present, in *Paramithrax* s.l. it is at once evident that *P. barbicornis* is widely different from the rest of the species in a number of important features, as will be seen by reference to the generic diagnoses and the key to genera given above. The more important of these differences are the degree of separation of the three parts of the supraorbital margin, the comparative length of the intercalated and postorbital spines, the degree of divergence of the rostral spines, the shape of the basal antennal article and the shape of the male abdomen, particularly that of the seventh segment in the species under consideration. In addition the form of the male first pleopods (for *P. barbicornis* see Griffin, in press; for *N. peronii* and *N. baekstroemi* see Garth, 1958: Pl. U, figs. 1, 1a and 2, 2a respectively) support the claim for generic distinctness of *P. barbicornis*. In view of these important differences I consider that Filhol and Balss were correct in placing *P. barbicornis* in a genus separate from the other species. However, as *P. barbicornis* is the type species of *Paramithrax*, the name *Paramithrax* can no longer be used for the remaining species, *P. peronii*, etc. Both Filhol and Balss, on the contrary, retained *Paramithrax*, in the sense in which it was defined by Miers (1879b) as a subgenus, and, being unaware of Desmarest's note in this regard, removed *P. barbicornis* to a separate genus.

There remains the problem of the systematic position of *Paramithrax parvispinosus* Ward. The two genera *Leptomithrax* and *Notomithrax* are most satisfactorily separated on the basis of orbital characters since the species show many intergeneric similarities in other characters such as form of the rostrum, basal antennal article, merus of the third maxilliped and shape of the male abdomen. The ornamentation of the chelipeds and also of the carapace are sometimes valuable in confirming a placing on the basis of orbital characters. The differences in these characters shown by the two genera are given in the key at the end of the systematic section of this paper. *Paramithrax parvispinosus* shows (according to the type specimen, a female, Aust. Mus. No. P 10640, in the collections of the Australian Museum, Sydney) the following features: supraorbital eave, intercalated spine and postorbital spine closely approximated to one another, intercalated spine almost excluded from the rim of the supraorbital margin by the large flattened spine at the posterolateral angle of the eave which is produced laterally toward the weakly flattened postorbital spine which is setose on the anterior edge; eyestalk stout, reaching the postorbital spine, cornea very large. On the other hand this species presents two rather important features of resemblance to species of *Notomithrax*, particularly *N. minor*, namely a lack of spines or tubercles on the chelipeds and a well developed oblique ridge on the lateral surface of the carpus of the cheliped. The laterally produced, flattened

anterolateral spine of the basal antennal article, the sparsely tuberculated carapace and the distally notched merus of the third maxilliped of *P. parvispinosus* are features shown by other species at present placed in *Notomithrax*, and others belonging to *Leptomithrax*. The rostrum is now missing from the type specimen, although Ward (1933: Pl. 23, fig. 41) shows the rostrum as consisting of two slender, divergent spines, similarly a character which would allow its placing in either genus. On the basis of the above, it seems most appropriate to remove *Paramithrax parvispinosus* Ward, 1933, to the genus *Leptomithrax* Miers. However, since only the one small female specimen of the species is known, this placing should be regarded as necessarily somewhat tentative.

The genus *Notomithrax* is most closely related to the Indo-West Pacific genus *Leptomithrax* Miers (as already inferred), while *Paramithrax* H. Milne Edwards, s.s. appears to stand close to the Australian genus *Anacinetops* Miers (= *Eruma* McCulloch, see Hale, 1927: 131) but Balss (1935) places the latter genus in the Inachinae whereas *Paramithrax* is almost certainly a majine genus.

ACKNOWLEDGMENTS

This work was carried out as part of the requirements for the degree of M.Sc. in Zoology at Victoria University of Wellington. Grateful acknowledgment is expressed to Professor L. R. Richardson of that University for his helpful guidance throughout the study.

I also wish to express my appreciation to Mr F. A. McNeill, of the Australian Museum, Sydney, for the loan of a specimen of *Paramithrax barbicornis* and to Dr John S. Garth, Allan Hancock Foundation, Los Angeles, and Dr L. B. Holthuis, Rijksmuseum van Natuurlijke Histoire, Leiden, for helpful comment. To Dr John C. Yaldwyn, Australian Museum, Sydney, formerly of the Dominion Museum, Wellington, I am grateful for helpful discussion and for critically reading the manuscript.

SUMMARY

1. The genus *Paramithrax* H. Milne Edwards, 1834, has become established in the literature for seven species of majid spider crab from New Zealand, south-east Australia, Norfolk Island, and Juan Fernandez, off the coast of Chile, with *Paramithrax peronii* H. Milne Edwards accepted as the type species of the genus following Miers (1879b).
2. *Pisa barbicornis* Latreille, included in *Paramithrax* by H. Milne Edwards (1834) was designated type species of *Paramithrax* by Desmarest (1858), but redescribed as *Gonatorhynchus tumidus* by Haswell (1880) under which name it has become generally known in the Australian literature.
3. *Paramithrax barbicornis* is no longer considered to be congeneric with those species up till now included in *Paramithrax*. A similar conclusion was reached by Filhol (1885) and Balss (1929) who placed this species in a separate monotypic genus.
4. Desmarest's designation of *P. barbicornis* as the type species of *Paramithrax* precedes Miers's of *P. peronii*, so that the former must stand while the latter must be considered invalid.
5. The genus *Paramithrax* is redefined and restricted to include only *P. barbicornis*, while a new genus, *Notomithrax*, is set up to accommodate six of the remaining species, *P. peronii* being designated type species.
6. The last of the seven species formerly included in *Paramithrax*, *P. parvispinosus* Ward, is transferred, on the basis of orbital details, to *Leptomithrax*, following re-examination of the type specimen of that species.

7. A key to the genera *Paramithrax* s.s., *Notomithrax* and *Leptomithrax*, and to the species of *Notomithrax*, is given.

REFERENCES

- ALCOCK, A. W., 1895. Materials for a Carcinological Fauna of India. I. The Brachyura Oxyrhyncha. *J. Asiat. Soc. Beng.* 64: 157-291, Pls. 3-5.
- BALSS, H., 1924. Decapoden von Juan Fernandez. In "The Natural History of Juan Fernandez and Easter Island", ed. C. Skottsberg. *Zool. Bidr. Uppsala* 3: 329-340, Pls. 1-3.
- 1929. Decapoden des Roten Meeres. IV. Oxyrhyncha und Schlussbetrachtungen. *Denkschr. Akad. Wiss. Wien., Math-nat. Kl.* 102: 1-30, text-figs. 1-9, Pl. 1.
- 1935. Brachyura of the Hamburg Museum Expedition to South-western Australia, 1905. *J. Roy. Soc. W. Aust.* 21: 113-151, figs. 1-5, Pl. 13.
- 1957. Decapoda. VIII. Systematik. In H. G. Bronns' *Klassen und Ordnungen des Tierreichs* Bd. V, Abt. I, Buch 7, Lfg. 12: 1505-1672, Text-figs. 1131-1199.
- BARNARD, K. H., 1950. Descriptive Catalogue of the South African Decapod Crustacea (Crabs and Shrimps). *Ann. S. Afr. Mus.* 38: 1-837, figs. 1-154.
- BORRADAILE, L. A., 1916. Crustacea: Pt. I—Decapoda. *Brit. Antarct. ("Terra Nova") 1910 Exped., nat. Hist. Rep., Zool.* 3 (2): 75-110, Text-figs. 1-16.
- BOUVIER, E. L., 1940. Décapodes marcheurs. In *Faune de France*, vol. 37. Lechevalier, Paris. 404 pp., 202 text-figs., 14 pls.
- CHILTON, C., and BENNETT, E. W., 1929. Contributions for a Revision of the Crustacea Brachyura of New Zealand. *Trans. N.Z. Inst.* 59: 731-778.
- DELL, R. K., 1960. Crabs (Decapoda, Branchyura) of the Chatham Islands 1954 Expedition. *N.Z. Dept. sci. industr. Res. Bull.* 139 (1): 1-7, figs. 1-6, Pls. 1, 2.
- DESMAREST, E., 1858. Crustacés. In Chenu's *Encyclopédie d'Histoire Naturelle. Crustacés, Mollusques et Zoophytes*, Pt. 1. Paris. 312 pp.
- FILHOL, H., 1885. Considerations relatives à la faune de Crustacés de la Nouvelle-Zélande. *Bibl. Ecole hautes Etudes (Sci. nat.)* 30 (2): 1-60.
- 1886. Catalogue des Crustacés de la Nouvelle-Zélande, des îles Auckland et Campbell. In *Mission de l'Île Campbell* 3 (2): 349-510, Pls. 38-55. Paris.
- FULTON, S. W., and GRANT, F. E., 1906. Census of the Victorian Decapod Crustacea. Pt. I (Brachyura). *Proc. Roy. Soc. Vict.* 19 (1): 16-20.
- GARTH, J. S., 1958. Brachyura of the Pacific Coast of America: Oxyrhyncha. *Allan Hancock Pacif. Exped.* 21, 854 pp., 106 tables, 9 text-figs., 85 pls.
- GRIFFIN, D. J. G. (in press). Redescriptions of the Australian majid spider crabs *Leptomithrax gamardii* (H. Milne Edwards) and *Paramithrax barbicornis* (Latreille). *Rec. Aust. Mus.*
- HALE, H. M., 1927. *The Crustaceans of South Australia*. Pt. 1. Govt. Printer, Adelaide. 201 pp., 202 figs.
- HASWELL, W. A., 1880. On the Australian Brachyura Oxyrhyncha. *Proc. Linn. Soc. N.S.W.* 4: 431-458, Pls. 25-27.
- 1882a. On some new Australian Brachyura. *Proc. Linn. Soc. N.S.W.* 6: 540-551.
- 1882b. Descriptions of some New Species of Australian Decapoda. *Proc. Linn. Soc. N.S.W.* 6: 750-763.
- 1882c. *Catalogue of the Australian Stalk- and Sessile-eyed Crustacea*. Australian Museum, Sydney. 324 pp., 4 pls.
- HODGSON, T. V., 1902. Crustacea. In *Report on the collections of Natural History made in the Antarctic Regions during the voyage of the "Southern Cross"*. London, pp. 228-261.
- MCCULLOCH, A. R., 1913. Studies in Australian Crustacea. No. 3. *Rec. Aust. Mus.* 9 (3): 321-353, figs. 42-53, Pls. x, xi.
- MCNEILL, F. A., 1953. Carcinological Notes. No. 3. *Rec. Aust. Mus.* 23: 89-96, Pl. vii.
- MIERS, E. J., 1876a. Descriptions of some New Species of Crustacea, chiefly from New Zealand. *Ann. Mag. nat. Hist.* (ser. 4) 17: 218-229.
- 1876b. *Catalogue of the Stalk- and Sessile-eyed Crustacea of New Zealand*. Jansen, London, for Colonial Museum and Geol. Survey Dept. 136 pp., 3 pls.
- 1879a. Descriptions of New or little known Species of Maioid Crustacea in the British Museum. *Ann. Mag. nat. Hist.* (ser. 5) 4: 1-28, Pls. 4, 5.
- 1879b. On the classification of the Maioid Crustacea or Oxyrhyncha, with a synopsis of subfamilies and genera. *J. Linn. Soc. Lond. (Zool.)* 14: 634-673, Pls. 12, 13.
- 1886. Report on the Brachyura collected by H.M.S. "Challenger" during the years 1873-1876. *Rep. Voy. Challenger, Zool.* 17: 1-362, Pls. 1-29.

- MILNE EDWARDS, H., 1834. *Histoire Naturelle des Crustacés, comprenant l'anatomie, la physiologie et la classification de ces animaux*. Vol. I. Lib. Roret, Paris. xxv + 468 pp.
- RATHBUN, M. J., 1893. Catalogue of the crabs of the family Maiidae in the U.S. National Museum. *Proc. U.S. Nat. Mus.* 16: 63-103, Pls. 3-8.
- 1918. Report on the Spider Crabs obtained by the F.I.S. "Endeavour" on the coasts of Queensland, New South Wales, Victoria, South Australia and Tasmania. *Biol. Res. Fish. Exp. Endeavour* 5 (1): 1-29, Pls. 1-15.
- 1925. The Spider Crabs of America. *U.S. Nat. Mus. Bull.* 129, 613 pp., 153 figs., 283 pls.
- RICHARDSON, L. R., 1949. A Guide to the Oxyrhyncha, Oxystoma and lesser crabs. *Tuatara* 2 (2): 58-69, figs. 25-51.
- THOMSON, G. M., 1902. On a New Species of *Paramithrax* from New Zealand. *Ann. Mag. nat. Hist.* (ser. 7) 10: 361-364, Pls. 7, 8.
- WARD, M., 1933. New genera and species of marine Decapoda Brachyura. *Aust. Zool.* 7: 337-394, Pls. 21-23.

D. J. G. GRIFFIN, M.Sc.,
Zoology Department,
University of Tasmania,
Box 252-C, G.P.O., Hobart,
Tasmania, Australia.