NOTES ON LITTORAL PENAEINAE (CRUSTACEA: DECAPODA) FROM THE NEW GUINEA AREA

A. A. Racek* and J. C. Yaldwyn†

[Accepted for publication 19th August 1970]

Synopsis

An account is given of twelve species of penaeid prawns from recent collections in the New Guinea-West Irian area. Of these, two shallow-water penaeids, *Metapenaeus affinis* and *M. dobsoni*, previously unknown east of Makassar Strait, represent new records. The specific status of two *Metapenaeopsis spp.* from New Britain, only tentatively identified by Racek and Dall (1965), is now resolved, and some difficulties regarding the precise generic position of *Trachypenaeus gonospinifer* are discussed.

Introduction

Recent experimental prawn trawls along the northern shores of New Guinea yielded some very interesting specimens of shallow-water penaeids, samples of which were forwarded to the Australian Museum, Sydney, by Mr. L. W. Filewood, Department of Agriculture, Stock, and Fisheries, Konedobu, Papua. To the twenty-six penaeine species, recorded by Racek and Dall (1965) for the New Guinea area, two additional species can now be added, which were believed previously to be absent east of Makassar Strait and the western Sulu Sea. Furthermore, the authors are taking this opportunity to clarify the status of two species of *Metapenaeopsis* from New Britain, tentatively determined by Racek and Dall (1965) as belonging to *M. mogiensis* and *M. distincta,* respectively.

The specific identity of an hitherto undescribed *Metapenaeus* sp. from the northern shores of New Guinea has yet to be resolved. Since it is represented by only two females of slightly differing morphometric criteria, and in view of its similarity to a new species from the Palau Islands (Holthuis, unpublished data), the present authors consider it advisable not to deal with its description until additional material, and in particular mature males, are available.

The present paper also deals with taxonomic difficulties arising from the rediscovery of *Trachypenaeus gonospinifer* in the Arafura Sea during experimental prawn trawls of the Indonesian Government south of West Irian.

In the text, the abbreviation t.l. refers to total body length, and c.l. to carapace length. The registration numbers quoted are those of the Australian Museum, Sydney.

Taxonomy

Genus Penaeus Fabricius

Penaeus Monodon Fabricius

Penaeus monodon Fabricius, 1798, p. 408. Racek & Dall, 1965, p. 10 (and synonymy).

Material: New Guinea: Off Sepik River, trawled in 3–8 fm. by F.R.V. *Tagula,* October 1965, 1 ♀ t.l. 274 mm., c.l. 63 mm., P 15574.

Distribution: Widely distributed throughout the greater part of the Indo-West Pacific region; previously recorded from New Guinea.

* School of Biological Sciences, University of Sydney.
† Dominion Museum, Wellington C.3, New Zealand.

Penaeus merguiensis De Man

Penaeus merguensis De Man, 1888, p. 287. Racek and Dall, 1965, p. 16 (and synonymy).

Material: New Guinea: Off Sepik River, trawled in 3–8 fm. by F.R.V. *Tagula*, October 1965, i ♀ t.l. 203 mm., c.l. 42 m., P 15775; 1 ♀, t.l. 223 mm., c.l. 48 mm., P 15576.

Distribution: Widely distributed in tropical waters from India eastward to New Caledonia, penetrating the Australian region southward to about 29°; previously recorded from New Guinea.

Genus Metapenaeopsis Bouvier

Metapenaeopsis hilarula (De Man)

Penaeopsis sp. (*hilarulus*) De Man, 1911, p. 70–71, pl. 7 fig. 22. Barnard, 1950, p. 595, fig. 108 g–l.

"Penaeus Palmensis" Schmitt, 1926, p. 344 (♀ t.l. 30 mm. only), pl. 61, fig. 3.

Metapenaeopsis mogiensis Dall, 1957, p. 172 (part; not fig. 12). Hall, 1962, p. 35, fig. 120. Racek and Dall, 1965, p. 42 (part), fig. 7, pl. 5 figs. 2–3.

Metapenaeopsis hilarulus De Bruin, 1965, p. 81, figs. 1b, 1d.

Material: New Britain: Massava Bay, 1 ♀ t.l. 41 mm., P 14244.

Distribution: From South Africa eastward to New Britain.

Discussion: De Man (1911), in his description of *Penaeopsis* sp., recorded some apparently constant thelycal differences between material from the Indonesian region, available for his study, and *Parapenaeus mogiensis* Rathbun (1902) as described under the generic name *Metapenaeus* by Alcock (1906). Although not prepared to erect a new species, De Man (1911) suggested the new name *P. hilarulus* for the prawn examined by him, should later research be able to demonstrate the differences observed. While Schmitt (1926), most likely due to the meagre Australian material of this "complex" at his disposal, considered *P. hilarulus* synonymous with *P. mogiensis*, Barnard (1950) introduced *P. hilarulus* for the first time as a distinct species, although pointing to a number of dubious distinguishing criteria from *P. mogiensis*, in particular the ill-known petasmata in both species. Thus the specific status of *P. hilarulus* De Man remained obscure, and this species continued to be relegated to a synonym of *P. mogiensis* Rathbun.

De Bruin (1965) has since convincingly demonstrated that the *P. mogiensis* complex consists of two distinct species, i.e., *Metapenaeopsis mogiensis* (Rathbun) s.s. and *M. hilarula* (De Man), differing from each other by a number of decisive criteria. His detailed redescriptions and illustrations of both these species now finally enable their ready discrimination in the material deposited in the Australian Museum. In view of these new developments, the formerly dubious female from Massava Bay (Racek and Dall, 1965, p. 44, fig. 7) can now be satisfactorily assigned to *M. hilarula*, while the petasma shown on Plate 5, figs. 2–3 in that paper must be considered to be that of the species discussed, and not that of *M. mogiensis* as stated by Racek and Dall.

Metapenaeopsis assimilis (De Man)

Penaeopsis assimilis De Man, 1920, p. 105.

Metapenaeopsis distincta Racek and Dall, 1965, p. 44, fig. 8.

Distribution: At present known only from the type locality (Sumatra, Indonesia), and New Britain.

Discussion: The decision of Racek and Dall (1965), tentatively to consider the above seven specimens from New Britain as *Metapenaeopsis distincta* (De Man), was aided by the previously obscure systematic position of *Penaeopsis assimilis* De Man, which has never been figured, and of which the types could not be examined at that time. This type material has since been morphometrically assessed by one of the present authors (A.A.R.) in the Rijksmuseum van Natuurlijke Historie, Leiden, who found the present material to be identical with the types in all major structural details. The thelycal and petasmal structures of the New Britain prawns are indistinguishable from those of the types, even though the Indonesian specimens are slightly larger, a fact which possibly accounts for some slight differences in pereopodal measurements of the present material. In view of this new development, the specific status of *Penaeopsis assimilis* can thus be finally clarified, and the species raised from the obscure position in which it remained since its original description. At the same time, the New Britain prawns can now be reliably identified as *Metapenaeopsis assimilis*.

The reinstatement of *M. assimilis* as a good species removes it from the group of ill-known or doubtful species, mentioned by Dall (1957, p. 166), which has become considerably smaller as the result of recent taxonomic revisions. One of these species, *P. gallensis* Pearson, 1905, appears closely related to the species discussed, although its structural differences noted by De Man (1920) seem sufficient for specific discrimination. This species, unfortunately, has never been closely re-examined, and was unavailable to the present authors. De Bruin (1965), while discussing a number of *Metapenaeopsis* spp. from Ceylon waters, and even creating a new species, *M. mannarensis*, did not even mention *P. gallensis*, so that its specific status remains in obscurity. Its early re-examination would appear highly desirable in order to establish its affinities to both *M. assimilis* and *M. mannarensis*, with which it apparently forms a distinct group within the genus.

Genus Metapenaeus Wood-Mason and Alcock

Metapenaeus affinis (Milne Edwards)

Penaeus affinis H. Milne Edwards, 1837, p. 416.

Metapenaeus affinis Racek and Dall, 1965, p. 68 (and synonymy).

Material: New Guinea: South of Ramu River, trawled in 4 fm. by L. W. Filewood, 18. vii. 1965 (occurring in commercial quantities), 1 ♂, c.l. 31 mm. (rostrum broken), P 15271; 1 ♀, c.l. 45 mm. (rostrum broken), P 15272.

Distribution: Previously known range of occurrence from the Indo-Pakistani subcontinent through Malaysia and part of Indonesia to Hong Kong; above material represents the first record for New Guinea.

Discussion: The apparently abundant occurrence of *M. affinis* in recent trawls in waters of New Guinea is indeed surprising, and contradicts the assumption of Racek and Dall (1965) that the Makassar Strait and the western Sulu Sea represent some barrier to its eastern distribution. The present material is fully comparable in structural details with all the specimens of this well-known species previously examined, and display no additional criteria for discussion.

Metapenaeus ensis (De Haan)

Penaeus monoceros ensis De Haan, 1850, p. 192.

Metapenaeus ensis Racek and Dall, 1965, p. 58 (and synonymy).

Material: New Guinea: Off Sepik River, trawled in 3–8 fm. by F.R.V. *Tagula,* October 1965, 1 ♀, t.l. 139 mm., c.l. 31 mm., P 15580.

Distribution: From Ceylon through Indonesian waters to New Guinea, ranging north to China and Japan, and south to the northern half of the Australian coastline; previously recorded from New Guinea.

Metapenaeus demani (Roux)

Penaeopsis demani Roux, 1922, p. 599.

Metapenaeus dobsoni Racek and Dall, 1965, p. 80 (and synonymy).

Material: New Guinea: Off Sepik River, trawled in 3–8 fm. by F.R.V. *Tagula,* October 1965, 4 ♀♀, t.l. 62–128 mm., c.l. 13–28 mm., P 15577.

Distribution: Centre of occurrence New Guinea, ranging to north-eastern Queensland.

Metapenaeus dobsoni (Miers)

Penaeus dobsoni Miers, 1878, p. 302.

Metapenaeus dobsoni (Racek and Dall, 1965, p. 80 (and synonymy).

Material: New Guinea: Off Sepik River, trawled in 3–8 fm. by F.R.V. *Tagula,* October 1965, 1 ♀, t.l. 108 mm., c.l. 22 mm., P 15578; 1 ♂, t.l. 78 mm., c.l. 17 mm., P 15579; South of Ramu River, trawled in 4 fm. by L. W. Filewood, 18. vii. 1965 (occurring in commercial quantities), 1 ♂, t.l. 98 mm., c.l. 20 mm., P 15584; 1 ♀, t.l. 121 mm., c.l. 25 mm., P 15585.

Distribution: Previously known to range from Indian waters through Malaysia and Indonesia to the Philippine Islands; the above material represents the first record for New Guinea.

Discussion: As in the case of *M. affinis,* the recorded abundant occurrence of *M. dobsoni* in waters of northern New Guinea certainly is most surprising. The specimens agree in all structural details with those previously studied from other parts of the Indo-West Pacific, and display no additional features for discussion.

Genus Atypopenaeus Alcock

Atypopenaeus formosus Dall

Atyopenaeus formosus Dall, 1957, p. 199.

Atypopenaeus formosus Racek and Dall, 1965, p. 85 (and synonymy).

Material: New Guinea: Off Sepik River, trawled in 3–8 fm. by F.R.V. *Tagula,* October 1965, 1 ♂, t.l. 75 mm., c.l. 17 mm., 2 ♀♀, t.l. 90–91 mm., c.l. 21 mm., P 15581.

Distribution: Southern Queensland (type locality) to about Darwin, Northern Territory, ranging into Papua; the above material represents the first record for the northern shores of New Guinea.

Genus Trachypenaeus Alcock

Trachypenaeus fulvus Dall

Trachypenaeus fulvus Dall, 1957, p. 106. Racek and Dall, 1965, p. 93 (and synonymy).

Material: New Guinea: Off Sepik River, trawled in 3–8 fm. by F.R.V. *Tagula,* October 1965, 1 ♀, t.l. 85 mm., c.l. 20 mm., P. 15583.

Distribution: Malaysia through Indonesian waters to the Philippines and New Guinea, and south to Australia.

Discussion: The female examined belongs to the "long-legged" form, mentioned by Racek and Dall (1965), for which a subspecific name will soon be introduced

(Racek, unpublished data on *Galathea* material). It displays no additional criteria for discussion.

Trachypenaeus gonospinifer Racek and Dall

Trachypenaeus gonospinifer Racek and Dall, 1965, p. 89.

Material: West Irian: Arafura Sea, 137° 07′ E., 08° 37′ S., collected with beam trawl in 52 m. of mud bottom by Mr. Purwito, 10. v. 1967, 3 ♂ ♂, c.l. 12–13 mm., 2 ♀ ♀, c.l. 15–16 mm., P 17666.

Distribution: Hitherto known only from Papua, New Guinea and the Northern Territory; the above material represents the first record from West Irian, Indonesia.

Discussion: The above material, kindly forwarded by Mr. Purwito of the Lembaga Penelitian Perikanan Laut, Djakarta, is morphometrically identical with the specimens used for the original description of this species. Like the Papuan specimens, the West Irian material does not possess any trace of epipodites on the third pereopods, whereas such mastigobranchiae could be observed on some of the specimens from the Northern Territory (Racek and Dall, 1965, p. 92). This obvious instability of a vital criterion for the discrimination of the genera *Trachypenaeus* and *Parapenaeopsis* is here again emphasized. Unless future detailed studies of these two genera do not reveal additional generic criteria, the retention of the species discussed in the genus *Trachypenaeus,* as presently defined, will become problematic. In particular, a greater number of specimens of *T. gonospinifer* from the entire range of its occurrence will have to be studied, before the incidence of absence or presence of the above mastigobranchiae can be reliably assessed. Of the 11 specimens, on which the original description was based, 8 were without epipodites on their 3rd pereopods, one had a rudimentary mastigobranch on one side only, and 2 displayed small but clearly defined epipodites on both of these legs.

Trachypenaeus gonospinifer is undoubtedly closely related to *T. sedili* Hall from Malaysian waters, whose generic criteria cannot possibly be challenged. The thelycal structures in these two species are similar in all aspects, and so are the filiform 5th pereopods, and the general rostral features. Even though the petasma of *T. sedili,* recently described by de Bruin (1965) for the first time, differs considerably from that of the species discussed, the petasmal features of *T. gonospinifer* are typical for the genus *Trachypenaeus,* and display no similarity to petasmal shapes found in any species of *Parapenaeopsis* hitherto recorded. Future research may perhaps indicate the possibility or necessity of the erection of a new genus for the inclusion of these two aberrant penaeine species. Until then, however, it seems advisable to include *T. gonospinifer* in the genus *Trachypenaeus.*

The Indonesian material is interesting in regard to its depth of occurrence. While all previous specimens were obtained in trawls on rather shallow grounds not exceeding 20 metres, those from West Irian were collected at a depth of 52 metres. This may perhaps indicate that the optimal habitat of *T. gonospinifer* is at greater depths, an assumption which could explain its paucity in previous collections.

Genus Parapenaeopsis Alcock

Parapenaeopsis cornuta maxillipedo Alcock

Parapeneopsis maxillipedo Alcock, 1906, p. 40.

Parapenaeopsis cornuta maxillipedo Racek and Dall, 1965, p. 99 (and synonymy).

Material: New Guinea: Off Sepik River, trawled in 3–8 fm. by F.R.V. *Tagula*, October 1965, 1 ♂ t.l. 72 mm., c.l. 16 mm.; 2 ♀ ♀, t.l. 90 mm., c.l. 22 mm., P 15582.

Distribution: Equatorial spread from the west coast of the Indo-Pakistani subcontinent through Malaysia to the Philippines and Papua; the above material represents the first record for the northern shores of New Guinea.

Discussion: The above females display a much reduced though clearly discernible basial spine on the 3rd pereopods, so that their retention in this subspecies seems warranted.

References

Alcock, A., 1906.—"Catalogue of the Indian Decapod Crustacea in the collection of the Indian Museum. Part III. Macrura. Fasc. I. The Prawns of the Peneus group." Indian Museum, Calcutta, 55 pp.

Barnard, K. H., 1950.—Descriptive catalogue of South African Crustacea. *Ann. S. Afr. Mus.*, 38: 1–837.

Bruin, G. H. P. De, 1965.—Penaeid prawns of Ceylon (Crustacea Decapoda, Penaeidae). *Zool. Meded.*, 41 (4): 73–104.

Dall, W., 1957.—A revision of the Australian species of Penaeinae (Crustacea Decapoda: Penaeidae). *Aust. J. Mar. Freshw. Res.*, 8 (2): 136–231.

Fabricius, J. C., 1798.—"Supplementum Entomologiae Systematicae." Hafniae, 572 pp.

Haan, W. De., 1850.—Crustacea. In P. F. Siebold, "Fauna Japonica". Leiden.

Hall, D. N. F., 1962.—Observations on the taxonomy and biology of some Indo-West Pacific Penaeidae (Crustacea, Decopoda). *Fishery Publs. Colon. Off.*, London, 17: 1–229.

Man, J. G. De, 1888.—Report on the Crustacea of the Mergui Archipelago I. *J. Linn. Soc. London (Zool.)*, 22 (140): 1–312.

————, 1911.—The Decapoda of the Siboga Expedition. Part I. Family Penaeidae. *Siboga Exped. Monogr.*, 39a: 1–131.

————, 1920.—Diagnoses of some new species of Penaeidae and Alpheidae with remarks on two known species of the genus *Penaeopsis* A. M. Edwards from the Indian Archipelago. *Zool. Meded.*, 5 (3): 103–106.

Miers, E. J., 1878.—Notes on the Penaeidae in the collection of the British Museum, with descriptions of some new species. *Proc. Zool. Soc. London*, 1878: 198–310.

Milne Edwards, H., 1837.—"Histoire Naturelle des Crustacés comprenant l'Anatomie, la Physiologie et la Classification de ces animaux". II. Lib. Rovet, Paris, 531 pp.

Pearson, J., 1905.—Report on the Macrura collected by Professor Herdman, at Ceylon, in 1902. In W. A. Herdman, "Report of the Government of Ceylon on the pearl oyster fisheries of the Gulf of Mannar", 4: 65–92.

Racek, A. A., and Dall, W., 1965.—Littoral Penaeinae (Crustacea Decapoda) from northern Australia, New Guinea, and adjacent waters. *Verh. k. Ned., Akad. Wet.*, 56 (3): 1–116.

Rathbun, Mary J., 1902.—Japanese stalk-eyed crustaceans. *Proc. U.S. Nat. Mus.*, 26: 23–55.

Roux, J., 1922.—Crustacés, Famille Penaeidae. *Nova Guinea*, 13: 599–601.

Schmitt, W. L., 1926.—Report on the Crustacea Macrura (families Penaeidae, Campylonotidae, and Pandalidae) obtained from the F.I.S. *Endeavour* in Australian seas. *Biol. Res. Fish. Exp. Endeavour*, 5: 309–381.