

On the taxonomic status of *Marygrande mirabilis* PESTA, 1911 (Crustacea: Decapoda: Palaemonidae)

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Abstract

Marygrande mirabilis PESTA, 1911 has not been found since its description. As a result the name has been considered a species inquirenda, although KEMP (1922) proposed that two species were involved, one of which was possibly a synonym of *Anchistus custos*. A re-examination of the type series, held in the Naturhistorisches Museum in Wien (Austria) has demonstrated that two species were confused in the type description. As a result, *Marygrande mirabilis* PESTA, 1911 is relegated to the synonymy of *Anchistus custos* (FORSKÅL, 1775) and *Anchistus miersi* (DE MAN, 1888).

Key words: *Marygrande*, *Anchistus*, Pontoniinae.

Zusammenfassung

Marygrande mirabilis PESTA, 1911 wurde seit der Erstbeschreibung nie wieder gefunden. Diese Art wurde daher als "species inquirenda" angeführt, obwohl schon KEMP (1922) vermutet hatte, dass zwei Arten beteiligt sind, eine davon möglicherweise ein Synonym von *Anchistus custos*. Eine Nachuntersuchung des Typenmaterials aus dem Naturhistorischen Museum in Wien hat gezeigt, dass tatsächlich zwei verschiedene Arten in der Beschreibung durcheinandergebracht wurden. *Marygrande mirabilis* PESTA, 1911 ist daher teilweise synonym mit *Anchistus custos* (FORSKÅL, 1775) und *Anchistus miersi* (DE MAN, 1888).

Introduction

Marygrande mirabilis PESTA, 1911 was described on the basis of five specimens, collected by Dr. K. Rechinger from Samoa, from the mantle cavity of *Tridacna gigas* LINNAEUS, 1758 (PESTA 1911). The genus *Marygrande* PESTA, 1911 was established to incorporate the new taxon, on the basis of the antepenultimate segment of the third maxilliped, which is described as being broad, with the penultimate and the ultimate segment being much narrower. In contrast, in the key, the genus *Anchistus* BORRADAILE, 1898 is described as having a narrow antepenultimate segment on the third maxilliped, not broader than the last two segments (PESTA 1911: 572). PESTA (1913) repeated his original description verbatim, without adding any additional information.

BORRADAILE (1917) established the synonymy of *Marygrande* with *Anchistus*. Although no details are provided to support the proposed synonymy, it can be assumed that it was based on the form of the third maxilliped in *Anchistus*, which is given in the generic diagnosis as either broad or narrow. Nevertheless, *Anchistus mirabilis* (PESTA, 1911) is listed in the key (p. 388) and again on p. 389 as a separate species. BORRADAILE (1917) also highlighted the differences in rostral morphology between *A. mirabilis* and *A. custos*

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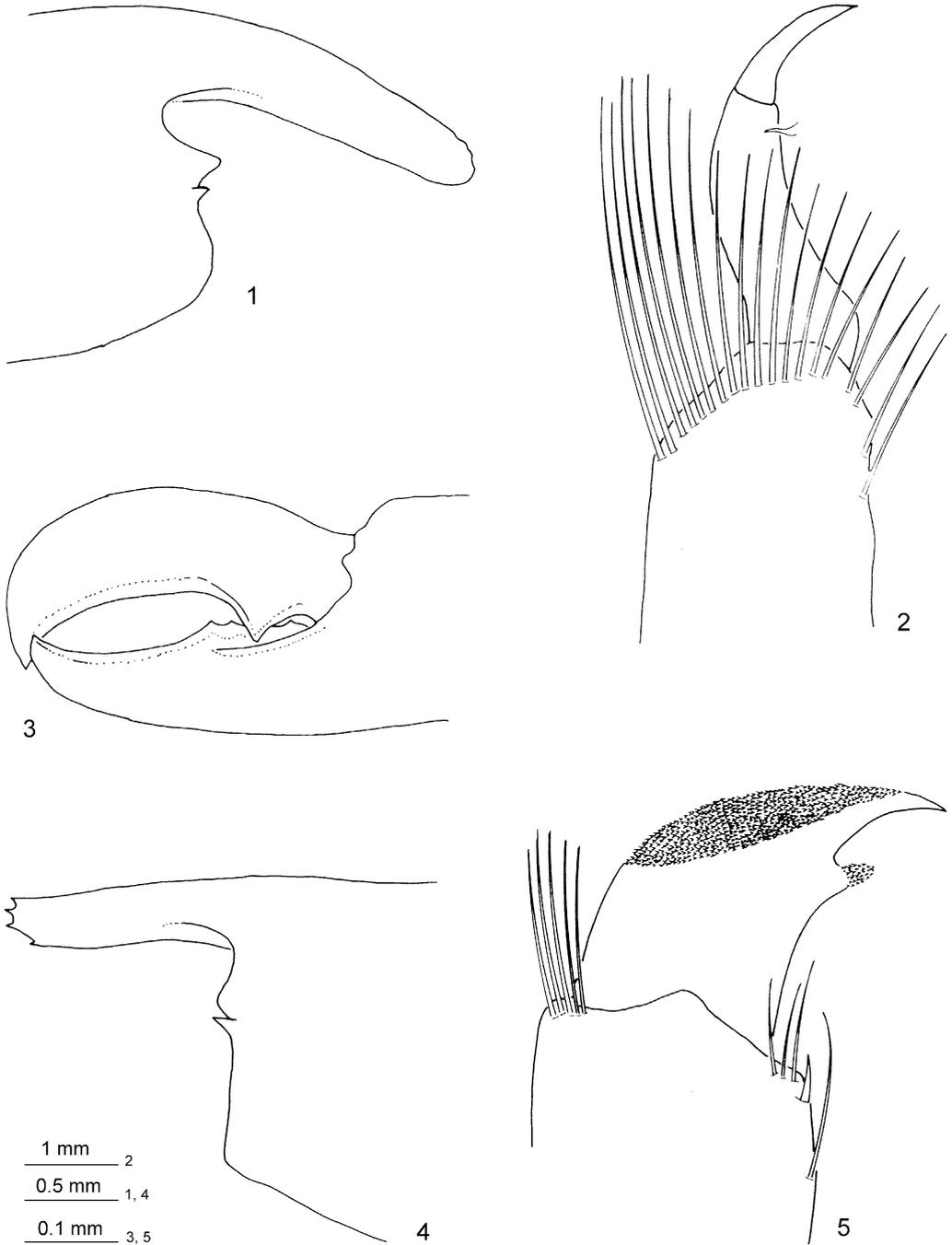
(FORSKÅL, 1775) (as *A. inermis* MIERS, 1884). KEMP (1922) questioned the validity of the taxon and suggested that the description was based on two species. This opinion was based on the fact that PESTA (1911) included a form with biunguiculate ambulatory pereopods and simple pereopods in the type description. Indeed, the structure of the dactyl is highly diagnostic at the species level, and as already stated by KEMP (1922), no species have been found which exhibit both forms of dactylar development. Kemp also suggested that the form with a simple dactyl is closely related to *A. custos* (as *A. inermis*), although he hinted that it may not be synonymous with this species. This assumption was based on the fact that *M. mirabilis* was collected from the mantle cavity of *Tridacna gigas*, whilst *A. custos* is invariably encountered in bivalves of the family Pinnidae. Similarly, insufficient details in the type description were highlighted and a re-examination of the type material recommended, before definitive conclusions could be reached.

Following this, HOLTHUIS (1952) treated *Marygrande mirabilis* as a species incertae, repeating the statement that in all probability two species were involved. Similarly, CHACE & BRUCE (1997) listed the species (as *Anchistus mirabilis*) as species inquirenda.

The type material of *Marygrande mirabilis* is still extant in the collections of the Naturhistorisches Museum in Vienna (NHMW) and consists of the following material. One bottle (NHMW 7819) containing two vials: NHMW 7819/1 complete body with both first pereopods attached and one detached second pereopod; NHMW 7819/2 abdomen (of specimen NHMW 7820/2) and numerous loose mouthparts and pereopods. A second bottle (NHMW 7820) contains four vials: NHMW 7820/1 complete body with both first pereopods and left third to fifth pereopod attached; NHMW 7820/2 incomplete body (posterior part of abdomen missing), left third and right fourth pereopod attached (rest missing); NHMW 7820/3 ovigerous female with both first pereopods attached, left fourth and fifth pereopod attached, rest missing; NHMW 7820/4 five loose second pereopods. Originally, all material from NHMW 7820 was contained in one vial and only later separated into 4 vials (P. Dworschak pers. comm.).

Systematic account

The type series of *Marygrande mirabilis* consists of two distinct taxa. Taxon A is characterised by an unarmed rostrum, apically truncate and a small antennal spine (Fig. 1), a simple dactyl on the ambulatory pereopods (Fig. 2) and the first pereopod harbouring a cannulate chelae. Two syntypic specimens belong to this taxon, both males (NHMW 7820/1 post-orbital carapace length 3.80 mm, NHMW 7819/1 pocl 4.05 mm). The specimen(s) illustrated in PESTA (1911, 1913) clearly belong to this taxon, with the exception of fig. 5a (PESTA 1911) and fig. 31e (PESTA 1913), which are based on specimen(s) belonging to taxon B. Taxon B is characterised by an apically acute rostrum, bearing several dorsal teeth, with a larger antennal spine below the orbital angle (Fig. 4) and a biunguiculate dactyl on the ambulatory pereopods (Fig. 5). Two syntypic specimens belong to this taxon, an ovigerous female (NHMW 7820/3, pocl 4.20 mm) and a male (NHMW 7820/2, pocl 3.90 mm). In Pesta's account, two specimens (including an ovigerous female) were assigned to a variety having a biunguiculate dactyl, corresponding to taxon B. The illustrations by Pesta (PESTA 1911: fig. 5a, PESTA 1913: fig. 31e) of the varietal dactyl are based on specimens belonging to this taxon. The present whereabouts of the fifth syntypic specimen are unknown.



Figs 1-5: *Marygrande mirabilis* PESTA, 1911. Taxon A: 1, frontal region of carapace NHMW 7819/1; 2, chelae of second pereiopod NHMW 7819/1; 3, dactyl of ambulatory (third?) pereiopod NHMW 7819/2. Taxon B: 4, frontal region of carapace NHMW 7820/1; 5, dactyl of ambulatory (third?) pereiopod NHMW 7819/2.

Clearly, taxon A is indistinguishable from *Anchistus custos* (FORSKÅL, 1775), a species mainly characterised by the cannulate chelae of the first pereopod and the presence of simple dactyli of the ambulatory pereopods (HOLTHUIS, 1952; BRUCE, 1982; DE GRAVE, 1999). Although both specimens correspond closely to previous descriptions of *A. custos*, one of the specimens harbours several minute crenulations on the dorso-distal margin of the rostrum (Fig. 1). BRUCE (1977) used this as one of the characters to separate his *Anchistus custoides* BRUCE, 1977 from *A. custos*. Nevertheless, the syntypic specimen still has both first pereopods attached, which are cannulate in nature. The syntypic specimens were compared with an ovigerous female (pocl 9.00 mm) of *A. custos* from Oman in the collections of the Oxford University Museum of Natural History. Although this specimen shows no evidence of rostral crenulations and harbours a proportionally smaller antennal spine, the chelae of the first pereopod are highly similar to the cannulate chelae displayed by the *M. mirabilis* taxon A syntypic specimens. Therefore, these two syntypic specimens are both referred to *A. custos* and not to *A. custoides*, which does not display a cannulate chelae. *Anchistus custos* is a widespread Indo-Pacific species, ranging from the Red Sea to Fiji, but has not previously been recorded from Samoa. Nine species of bivalve have been recorded as hosts for this species, eight of which are Pinnidae (FRANSEN 1995).

Taxon B is indistinguishable from *Anchistus miersi* (DE MAN, 1888), a species characterised by its rostral dentition and the characteristic biunguiculate dactyli of P3-5, as well as the detailed structure of the dorsal side of the dactyli. Both specimens agree closely with the type description (DE MAN 1888) and subsequent descriptions (BRUCE 1973, MONOD 1976, DE GRAVE 1999). *Anchistus miersi* is a widespread Indo-Pacific species, ranging from the Red Sea through to French Polynesia, but has not been recorded from Samoa. Eight species of bivalve have been recorded as hosts for this species, five of which are Tridacnidae (FRANSEN 1995). Although the records from Pteriidae and Pinnidae were questioned by FRANSEN (1995), DE GRAVE (1999) recorded the species from *Magnavicula penguin* RÖDING, 1798, thus confirming the occurrence with at least one species of Pteriidae.

PESTA (1911) indicates that the specimens came from the mantle cavity of a single *Tridacna gigas*. However, available evidence is strongly supportive of the fact that the type series was obtained from several specimens of bivalve host, possibly not all of the same species. Usually, Ptoniinae which inhabit the mantle cavity of bivalves occur in male-female pairs, with single males or females being far less frequent (JOHNSON & LIANG 1966). Couples of the same sex are very rare, but have been found (FRANSEN 1995). In addition, no examples have been encountered in which two species co-inhabit the same bivalve. This would appear to suggest that the type series of *M. mirabilis* came from at least two, possibly three different individual bivalves. The male and ovigerous female of *A. miersi* (NHMW 7820/2, 7820/3) presumably came from the same bivalve host, whilst the two male *A. custos* (NHMW 7819/1, 7820/1) in all likelihood came from an additional two bivalves, although as noted above, they may have originated from the same host. It also seems likely that the hosts belonged to two different species and were not all *Tridacna gigas*. Indeed, *A. custos* has not been recorded from any species of Tridacnidae, whilst *A. miersi* utilises several species of this family. Indirect support for this, is provided by the fact that the mollusc collection of the NHMW (P. Dworschak pers. comm.) contains specimens of *Pinna zeбуensis* REEVE, 1858 (presently considered

a junior synonym of *Pinna muricata* LINNAEUS, 1758) and *Tridacna elongata* LAMARCK, 1819 [presently considered a junior synonym of *Tridacna maxima* (RÖDING, 1798)], collected by Reching in Samoa. It therefore seems possible that the *A. miersi* specimens were collected from *T. maxima*, and the *A. custos* specimens from *P. muricata*.

Lastly, PESTA (1911) states that the colour of the specimens was light blue, contrasting to the mantle colour of its host, the giant clam. This statement is puzzling, as *A. miersi* is transparent bluish, with clearly visible red dots (FRANSEN 1994, DE GRAVE 1999) and *A. custos* is also transparent bluish, but with yellow-orange dots (DE GRAVE 1999). Furthermore, the mantle of *T. maxima* is usually of a bright blue colour. As the mantle colour of *P. bicolor* is mainly black, it seems possible that the colour description refers to the *A. miersi* specimens, and not to the *A. custos* specimens.

The present restudy of the type series of *Marygrande mirabilis* PESTA, 1911 has demonstrated that two species were confused in the type description, a fact already suspected by KEMP (1922). As a result, *Marygrande mirabilis* PESTA, 1911 is relegated to the synonymy of *Anchistus custos* (FORSKÅL 1775) and *Anchistus miersi* (DE MAN 1888).

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References

- BORRADAILE L. A., 1917: The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the Leadership of Mr. J. Stanley Gardiner, M.A.. No. IX.- On Carides from the Western Indian Ocean. – The Transactions of the Linnean Society of London 17(1): 397-412.
- BRUCE A. J., 1973: The pontoniid shrimps collected by the Yale Seychelles expedition, 1957-1958 (Decapoda, Palaemonidae). – Crustaceana 24: 132-142.
- BRUCE A. J., 1977: Pontoniine shrimps in the collections of the Australian Museum. – Records of the Australian Museum 31(2): 39-81.
- BRUCE A. J., 1982: The pontoniine shrimp fauna of Hong Kong. In: MORTON B. & TSENG C. K. (eds.) The marine flora and fauna of Hong Kong and southern China. Volume I, Introduction and taxonomy. – Hong Kong University Press, Hong Kong, pp. 233-284.
- CHACE F. A. J. & BRUCE A. J., 1993: The caridean shrimps (Crustacea: Decapoda) of the *Albatross* Philippine expedition, 1907-1910, Part 6: Superfamily Palaemonoidea. – Smithsonian Contributions to Zoology 543: 1-152.
- DE GRAVE S., 1999: Pontoniinae (Crustacea: Decapoda: Palaemonidae) associated with bivalve molluscs from Hansa Bay, Papua New Guinea. – Bulletin de l'Institut Royal des Sciences Naturelles de Belgique 69: 125-141.
- FRANSEN C. H. J. M., 1994: Marine palaemonoid shrimps of the Netherlands Seychelles Expedition 1992-1993. – Zoologische Verhandlungen, Leiden 297: 85-152.
- FRANSEN C. H. J. M., 1995: Shrimps and molluscs. Garnalen en weekdieren. – Vita Marina 42: 105-113.
- HOLTHUIS L. B., 1952: The Decapoda of the Siboga expedition, Part XI: The Palaemonidae collected by the Siboga and Snelius expeditions with remarks on other species, Part II: Subfamily Pontoniinae. – Siboga Expedition Monographs 39(a10): 1-254.

- JOHNSON D. S. & LIANG M., 1966: On the biology of the watchman prawn, *Anchistus custos* (Crustacea; Decapoda; Palaemonidae), an Indo-West Pacific commensal of the bivalve *Pinna*. – Journal of Zoology, London 150: 433-455.
- KEMP S., 1922: Notes on Crustacea Decapoda in the Indian Museum. XV. Pontoniinae. – Records of the Indian Museum 24: 113-288.
- MAN J. G. DE, 1888: Report on the podophthalmous Crustacea of the Mergui archipelago, collected for the trustees of the Indian Museum, Calcutta, by Dr. John Anderson, F.R.S., Superintendent of the Museum. – Journal of the Linnean Society of London 22: 1-305.
- MONOD T., 1976: Sur quelques Natantia (Crust. décapodes) de Nouméa (Nouvelle Calédonie). – Cahiers du Pacifique 19: 7-28.
- PESTA O., 1911: Beitrag zur Kenntnis der Pontoniiden. *Marygrande mirabilis* nov. gen. nov. spec. – Zoologischer Anzeiger 38: 571-575.
- PESTA O., 1913: VI. Crustacea II. Teil. Decapoda (mit Ausschluß der Brachyura) und Stomatopoda aus Samoa – In: K. RECHINGER (ed.) Botanische und Zoologische Ergebnisse einer wissenschaftlichen Forschungsreise nach den Samoa-Inseln, dem Neuguinea-Archipel und den Salomoninseln von März bis Dezember 1905. – Denkschriften der mathematisch-naturwissenschaftlichen Klasse der Kaiserlichen Akademie der Wissenschaften 89: 673-682.