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FIRST RECORD OF A PONTONIINE SHRIMP (CARIDEA,
PALAEMONIDAE) IN ASSOCIATION WITH A BORING BIVALVE OF
THE GENUS *SPENGLERIA* (BIVALVIA, EUHETERODONTA,
GASTROCHAENIDAE)

BY

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ABSTRACT

During fieldwork in Raja Ampat, West Papua, Indonesia, in 2007, a pontoniine shrimp, most likely belonging to the genus *Anchistus*, was collected from a coral boring bivalve of the genus *Spengleria*. This is the first record of a pontoniine shrimp living in association with a boring bivalve. As it probably concerns a juvenile shrimp, its identity remains unclear. Its affinities with the Indo-West Pacific mollusc-associated genera and with congeners are discussed.

RÉSUMÉ

Au cours d'un travail de terrain dans le Raja Ampat, Papouasie occidentale, Indonésie, en 2007, une crevette Pontoniinae, probablement appartenant au genre *Anchistus*, a été collectée dans un bivalve creusant le corail du genre *Spengleria*. C'est le premier enregistrement d'une crevette Pontoniinae vivant en association avec un bivalve perforant. Comme il s'agit probablement d'une crevette juvénile, son identité reste incertaine. Ses affinités avec les genres de l'Indo-Ouest Pacifique associés aux mollusques, et avec les congénères sont discutées.

INTRODUCTION

Nine Indo-Pacific pontoniine genera (*Anchiopontonia* Bruce, 1992, *Anchistus* Borradaile, 1898, *Bruceonia* Fransen, 2002, *Cainonia* Bruce, 2005, *Chernocaris* Johnson, 1967, *Conchodytes* Peters, 1852, *Neoanchistus* Bruce, 1975, *Paranchistus* Holthuis, 1952, and *Platypontonia* Bruce, 1968), comprising 30 species (De

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Grave et al., 2009), are known to be exclusively associated with a wide array of large bivalve molluscs.

During fieldwork in Raja Ampat, West Papua, Indonesia, in 2007, a juvenile specimen of a pontonine shrimp was encountered in a coral boring bivalve. It was collected with hammer and chisel from the faviid *Diploastrea heliopora* (Lamarck, 1816) (please refer to fig. 3A), a widespread coral species in the Indo-Pacific. The mollusc is identified as the endolithic bivalve *Spengleria mytiloides* (Lamarck, 1818) belonging to the Gastrochaenidae (cf. fig. 3B). Members of the mollusc family Gastrochaenidae have whitish valves with a broad ventral gape. The genus *Spengleria* is separated from the closely-related genus *Gastrochaena* by a deep oblique furrow from the umbo to the posteroventral corner. *Spengleria mytiloides*, the type species of this genus, has an anterior sculpture of irregular concentric ridges, with strong radial grooves posteriorly (Lamprell & Healy, 1998).

Little is known on organisms residing in Gastrochaenidae. The only published record is that of a new species of pinnotherid crab from an unidentified species of *Gastrochaena* by Kazmi & Manning (2003). The present, probably juvenile, shrimp specimen is most likely a representative of the genus *Anchistus*. Its affinities with other Indo-West Pacific mollusc-associated genera and with congeners are herein discussed.

The specimens are deposited in the Netherlands Centre for Biodiversity Naturalis, Leiden, the Netherlands. Abbreviations: pocl., postorbital carapace length; RMNH, Rijksmuseum van Natuurlijke Historie [now Netherlands Centre for Biodiversity Naturalis], Leiden, the Netherlands.

TAXONOMY

***Anchistus* spec.**

(figs. 1, 2, 3C)

Material examined. — Juvenile specimen, pocl. 1.2 mm, RMNH D 53198; Indonesia, Raja Ampat Islands, W. Papua, Mioskon Island, 00°29.808'S 130°43.623'E; 10–20 m depth; in the bivalve mollusc *Spengleria mytiloides* (RMNH.MOL.125986) collected itself from the scleractinian coral *Diploastrea heliopora*; 21 November 2007; collected by Sancia van der Meij; Raja Ampat Expedition stn. RAJ.08.

Description. — Carapace (fig. 1A) smooth, glabrous; rostrum (fig. 1A–C) compressed, unarmed, tip rounded, reaching penultimate segment of antennular peduncle, inferior orbital angle slightly produced (fig. 1C); supraorbital, epigastric, antennal, and hepatic spines absent (fig. 1C). Abdomen (fig. 1A) smooth, pleura rounded. Telson (fig. 1A) with two pairs of small dorsal spines in distal fourth, with three pairs of posterior spines, lateral pair small, about as long as dorsal spines. Antennula (fig. 1B) with basal segment of peduncle broad, with small

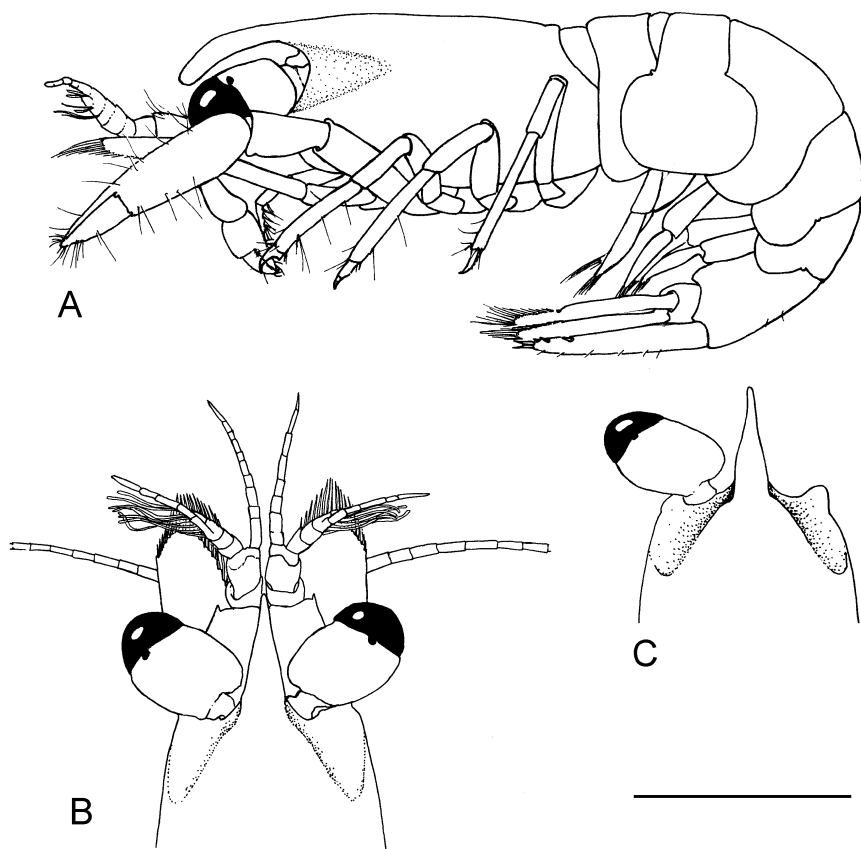


Fig. 1. *Anchistus* spec. RMNH D 53198. A, habitus, lateral view; B, anterior appendages, dorsal view; C, anterior margin of carapace, dorsal view. Scale 1 mm.

distolateral tooth, flagella short. Eyes (fig. 1A-C) with cornea hemispherical; accessory pigment spot present dorsolaterally; eyestalks as broad as cornea.

Epistome unarmed. Mouthparts not dissected. Third maxilliped with ischiomeral segment normal, not broadened. Fourth thoracic sternite without median process.

First pereopods (fig. 2A) moderately slender; chela with simple fingers with entire cutting edges; fingers almost as long as palm. Second pereopods (fig. 2B) equal in size and shape; fingers with two indistinct teeth in proximal part of cutting edge; fingers distally hooked, more strongly in dactylus, dactylus slightly overreaching fixed finger; fingers half as long as palm, palm slightly swollen. Ambulatory pereopods with compressed dactylus (fig. 2C); corpus with accessory tooth; unguis developed, strongly curved, with minute spinulation on outer surface.

Colour. — Translucent with red bands on pereopods, and scattered red chromatophores on carapace and abdomen (fig. 3C).

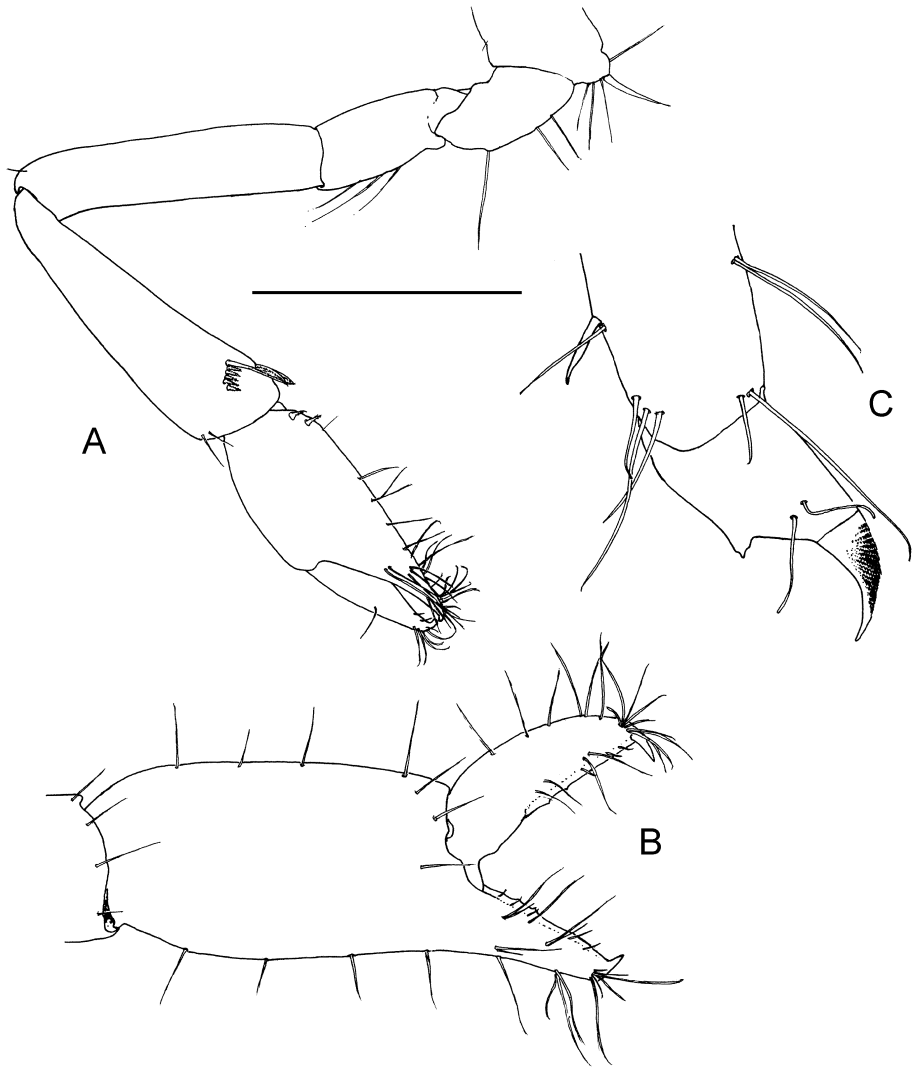


Fig. 2. *Anchistus* spec. RMNH D 53198. A, right first pereopod; B, right second chela; C, dactylus of right fifth pereopod. Scale A, B = 0.5 mm, C = 0.3 mm.

Systematic position. — The specimen differs from the known Indo-West Pacific genera of bivalve-associated shrimps in various aspects:

Anchiopontonia hurii (Holthuis, 1981). Known to be associated with *Spondylus* species. *A. hurii* differs from the present specimen in the following characters: (1) rostrum feebly dentate, (2) antennal spine present, (3) telson with two pairs of very large dorsal spines in proximal fourth.

Seven species are currently recognized in the genus *Anchistus* Borradaile, 1898: *A. australis* Bruce, 1977; *A. custoides* Bruce, 1977; *A. custos* (Forskål,

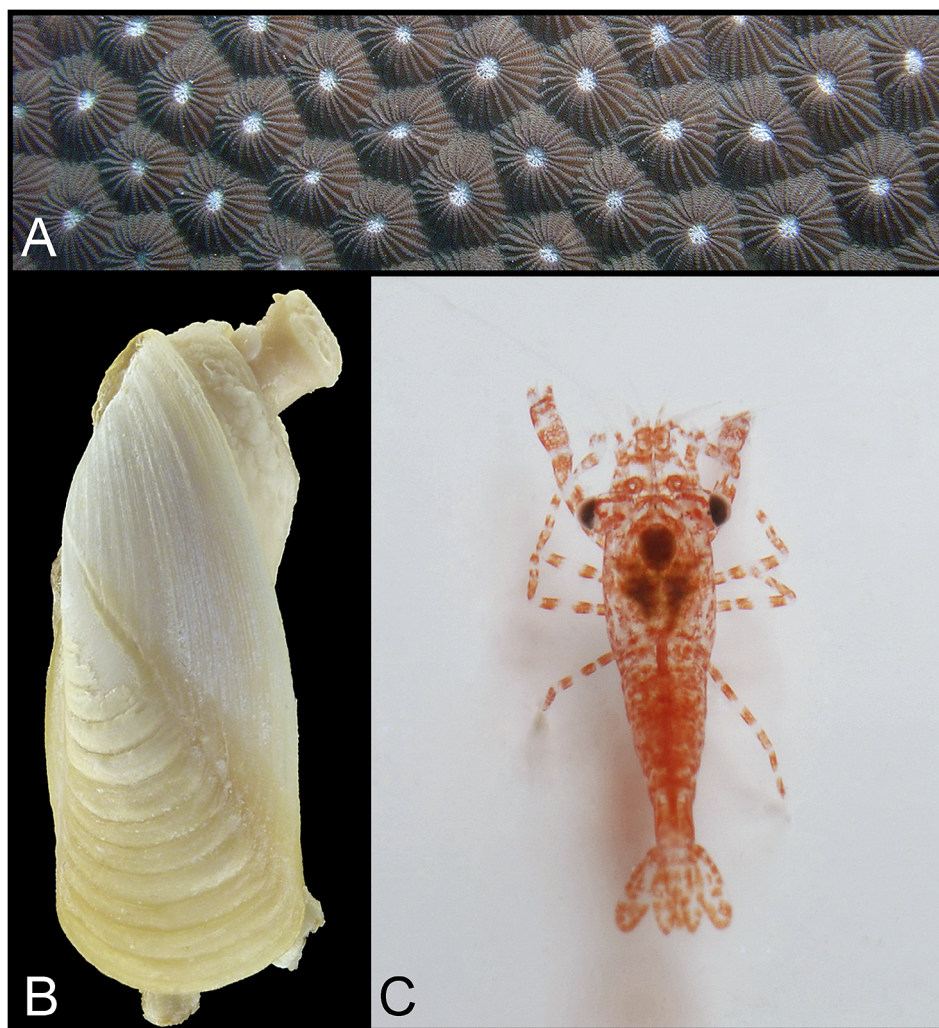


Fig. 3. A, close-up of *Diploastrea heliopora* (Lamarck, 1816), taken during the Raja Ampat Expedition [photo S. E. T. van der Meij]; B, *Spengleria mytiloides* (Lamarck, 1818), RMNH.MOL.125986, length 3.8 cm [photo S. E. T. van der Meij]; C, *Anchistus* spec., RMNH D 53198, pocl. 1.2 mm [photo C. H. J. M. Franssen].

1775); *A. demani* Kemp, 1922; *A. gravieri* Kemp, 1922; *A. miersi* (De Man, 1888); *A. pectinis* Kemp, 1925. These species have been recorded in association with bivalves of the genera *Amusium*, *Atrina*, *Hippopus*, *Pinctada*, *Pinna*, *Pteria*, *Spondylus*, and *Tridacna*. The present specimen differs from the known species of the genus in having (1) an unarmed rostrum and (2) the first pereopods with the fingers non-subspatulate. The present specimen would fit the generic definition except for the fingers of the first chela that are not subspatulate. In *A. custos* and

A. custoides the rostrum is without distinct teeth as in the present specimen. In these species, however, there is no sign of an accessory tooth on the dactylus of the ambulatory pereopods. A small accessory tooth is present in *A. australis*, *A. demani*, *A. miersi*, and *A. pectinis*, these, however, do have distinct teeth on the rostrum.

Cainonia medipacifica (Edmondson, 1935). Recorded in association with *Spondylus varius* Sowerby I, 1827 (see Fransen, 2002, as *Spondylus varians* Sowerby II, 1847). *Cainonia* differs from the present specimen in the following characters: (1) rostrum very short and acute, (2) acute antennal spine present, (3) large dorsal telson spines in proximal third, (4) ventral margin of corpus of ambulatory dactyli with series of blunt, club-like teeth.

Bruceonia ardeae (Bruce, 1981). Recorded in association with *Chama pacifica* Broderip, 1835 (see Fransen, 2002). *Bruceonia* differs from the present specimen in the following characters: (1) scaphocerite with strong distolateral tooth, (2) dactyli of ambulatory pereopods with recurved accessory tooth, (3) proximal pair of dorsal spines on telson in proximal third of telson.

Chernocaris placunae Johnson, 1967, is known to live inside *Placuna placenta* (Linnaeus, 1758). The differences with the present specimen are as for *Conchodytes*.

The genus *Conchodytes* Peters, 1852, at present contains nine species, which are all associated with bivalve molluscs and distributed in the Indo-West Pacific: *C. biunguiculatus* (Paul'son, 1875); *C. kemp*i Bruce, 1989a; *C. maculatus* Bruce, 1989b; *C. meleagrinae* Peters, 1852; *C. monodactylus* Holthuis, 1952; *C. nipponensis* (De Haan, 1844); *C. philippinensis* Bruce, 1996; *C. pteriae* Fransen, 1994; and *C. tridacnae* Peters, 1852. These species have been recorded in association with bivalves of the genera *Atrina*, *Amusium*, *Pecten*, *Pinctada*, *Pinna*, and *Tridacna*. *Conchodytes* differs from the present specimen in the following characters: (1) the presence of a strong distolateral tooth on the scaphocerite, (2) ischimerus of the third maxilliped broad, (3) proximal dorsal spines on telson in proximal fourth except for *C. monodactylus* in which species it is located just proximal of the middle, (4) dactyli of ambulatory pereopods with distinct basal protuberance.

Neoanchistus Bruce, 1975. *Neoanchistus cardiodytes* Bruce, 1975, is associated with *Vasticardium pectiniforme* (Born, 1780) [as *Trachycardium*], and *Neoanchistus nasalis* Holthuis, 1986, with *Chlamys townsendi* (Sowerby III, 1895). *Neoanchistus* differs from the present specimen in the following characters: (1) scaphocerite with distinct distolateral tooth, (2) first pereopods with chela subspatulate, (3) dactyli of ambulatory pereopods without accessory tooth.

In the genus *Paranchistus* Holthuis, 1952, six species are currently recognized: *Paranchistus armatus* (H. Milne Edwards, 1837); *P. liui* Li, 2004; *P. nobilii* Holthuis, 1952; *P. ornatus* Holthuis, 1952; *P. pycnodontae* Bruce, 1978;

P. spondylis Suzuki, 1971. These species have been recorded in association with bivalves of the genera *Atrina*, *Hyotissa*, *Ostrea*, *Pinna*, *Pycnodonta*, *Spondylus*, and *Tridacna*. *Paranchistus* differs from the present specimen in the following characters: (1) rostrum feebly dentate distally, (2) antennal and mobile hepatic spine present, (3) first pereopods with subspatulate, finely pectinate fingers.

Platypontonia Bruce, 1968: *Platypontonia brevirostris* (Miers, 1884), associated with *Lopha cristagalli* (Linnaeus, 1758); *P. hyotis* Hipeau-Jacquotte, 1971, with *Pycnodonta hyotis* (Linnaeus, 1758). *Platypontonia* differs from the present specimen in the following characters: (1) rostrum very short, not extending beyond eyes, (2) antennal spine well developed, (3) dactyli of ambulatory pereopods without accessory tooth.

DISCUSSION

As not much is known about the changes in morphology from the juvenile stage to the adult stage in pontoniines, it is not possible to be certain about the identity of the present juvenile specimen. The strongly hooked dactylus of the second pereopods, the fine pectination on the outer surface of the ambulatory dactyli, as well as the position of the dorsal spines on the telson, this specimen has in common with several species of *Anchistus*. The fingers of the first chela, however, are not subspatulate, which is, at present, considered diagnostic for the genus. However, this might be a character that is not yet developed in juveniles. It is, therefore, most likely that the specimen belongs to a species in the genus *Anchistus*.

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