



The coral gall shrimp, *Paratypton siebenrocki* Balss, 1914 (Crustacea: Decapoda: Pontoniinae), occurrence in French Polynesia, with possible abbreviated larval development

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Abstract: The little known pontoniine coral gall shrimp *Paratypton siebenrocki* Balss, 1914, is recorded for the first time from French Polynesia, a considerable extension of its previously known range. The specimens were found on Moorea at 1.0 metre depth, in a gall in an *Acropora* colony. This shrimp is the only caridean known to form enclosed galls in coral hosts. The eyed ova are unusually large, about 0.9 mm in length, suggesting possible abbreviated larval development.

Résumé : La crevette formant des galles dans les coraux, *Paratypton siebenrocki* Balss, 1914 (Crustacea: Decapoda: Pontoniinae) : découverte en Polynésie française et possible développement larvaire abrégé. La crevette peu connue formant des galles dans les coraux *Paratypton siebenrocki* Balss, 1914 est pour la première fois signalée en Polynésie Française, ce qui représente une extension considérable de sa distribution connue. Les spécimens ont été trouvés sur l'île de Moorea à une profondeur d'un mètre, dans un cyste d'une colonie d'*Acropora*. Cette crevette est le seul caridé connu qui forme des galles dans un hôte corallien. Les oeufs dotés d'yeux sont inhabituellement larges, environ 0,9 mm de longueur, suggérant un possible développement larvaire abrégé.

Keywords: *Paratypton siebenrocki* • Caridea • Pontoniinae • Moorea • French Polynesia • First occurrence • Abbreviated larval development • *Acropora mossambica*

Introduction

The coral gall shrimp *Paratypton siebenrocki* Balss, 1914, is the only shrimp known to form galls, or cysts, in a scleractinian coral host, where it lives as heterosexual pairs.

It is the only species of its genus. It was first collected during the expeditions of the R.V. *Pola* to the Red Sea, 1896-1896, 1897-1898, under the direction of Prof. Friedrich Siebenrock (1853-1925) of the Natural History Museum, Vienna, after whom it was named, and where the four syntype specimens are still held. Further specimens were also reported from Jaluit in the Marshall Islands.

Balss (1914) provided a brief preliminary description with an illustration of the whole shrimp, and then a more

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detailed account with more detailed illustrations of the appendages (Balss, 1915). No information on the shrimp's biology was recorded.

The gall forming habit was first noticed by F.A. Potts, whose specimens from an *Acropora* from Samoa were described by L.A. Borradaile (1921). More details of the gall and the shrimp were provided by Bruce (1969). The galls are typically deeply embedded in the coral host, with communication with the outside only through several small apertures, and can be difficult to locate. Most specimens are probably collected more by accident than design, generally as a result of destructive coral sampling. As this is now often considered inappropriate, further reports are likely to be infrequent. As a result the biology of this species remains very poorly known, having advanced little since the initial descriptions and the observations by Borradaile (1921), who noted that "It will be seen that there are many unsolved problems relating to the bionomics of *Paratypton*". Juvenile stages have been described by Bruce (1980).

The presence of *Paratypton siebenrocki* on Moorea in French Polynesia indicates a considerable extension of its known range, east from the Samoan Islands. The available records now indicate that the species has a wide Indo-West Pacific distribution and may probably occur in that region wherever suitable *Acropora* hosts thrive. The large size of the ova also suggests that the species may have abbreviated larval development, although the actual degree of larval development could not be precisely ascertained. Only a single species of pontonine shrimp is so far known to have abbreviated larval development, *Pseudopontonia minuta* (Baker).

The specimens are deposited in the collections of Los Angeles County Natural History Museum. Major references only cited, full references can be found in Li (2000).

Abbreviation used: CL, postorbital carapace length. LACM, Los Angeles County Museum, Los Angeles.

Results

Paratypton siebenrocki Balss, 1914 (Fig. 1)

Restricted synonymy

Paratypton siebenrocki Balss, 1914: 45: 84, fig. 1. – Borradaile, 1921: 65(11): 1-11, figs 1-11. – Bruce, 1969: 17(2): 170-179, figs 1-5, pl.1; 1976: 59: 120-124, figs 19-20. – Li, 2000: 114-115, fig. 126.

Paratypton Siebenrocki – Balss, 1915: 91 suppl., 30-31, figs 18-25.

Material examined.

1 ♂, CL 1.8 mm, 1 ovig. ♀, CL 2.7 mm, Moorea, Windward Islands, Society Islands, French Polynesia, 17°2'E 149°4'W, 1.0 m, coll. S. Trautwein, 3 May 2006, LACM CR 2006.002.1

Remarks

The two specimens are in good condition and complete, although the female shows marked post-mortem swelling, particularly of the pleura. The specimens agree well with the previously published descriptions. The female has a CL of 2.7 mm and an abdominal length, including telson, of 7.5 mm, or a total body length of about 9.2 mm. The second pereopods are subequal. The male has a CL of 1.8 mm and an abdominal length, including telson, of 2.6 mm, or a total body length of about 4.4 mm. It closely resembles the figure provided by Bruce (1972a, fig. 1A) and shows the unilaterally greatly elongated third pereopod on the right side, a feature unique in the Pontoninae. The function of this appendage remains an enigma. The second pereopods are similar, the chelae unequal, the major chela 2.6 mm, about 1.2 times the length of the minor chela.

Colouration in life (from colour photo, S. Trautwein) uniformly whitish.

The ovum has a length of 0.9 mm, and shows well developed eyes. Attempts to dissect out the larva were not successful but no signs of limb development could be discerned. This suggests that the ovum is still to undergo considerable development and probably further increase in size before eclosion. Most pontonine shrimps have an ovum length of about 0.5-0.6 mm immediately prior to eclosion and hatch as a Stage 1 zoeal larva. The ovum of *P. siebenrocki* is smaller than that of *Pseudopontonia minuta* (Baker, 1907), the only pontonine shrimp definitely known to have abbreviated larval development (Bruce, 1972b). In contrast to *P. minuta*, in which the ova are very few in number, about 25 (Bruce, 1972b), *P. siebenrocki* has a vast number, overflowing the brood chamber in all directions, over 1000 in some examples (Bruce, 1977) thereby combining both k and r reproductive strategies. *Pseudopontonia minuta* is now known to be an associate of the ascidian *Polycarpa nigrescens* (Heller, 1878) (Fransen, 2006), and has been found only in southern and eastern Australian waters and most recently from Mozambique.

Host

The present specimens were found in a cyst in an *Acropora*, which has been identified by Dr Carden Wallace as *Acropora mossambica* Riegl, 1995. This represents a new host record.

This shrimp is an obligatory associate known only from corals of the genus *Acropora*. The shrimps have previously

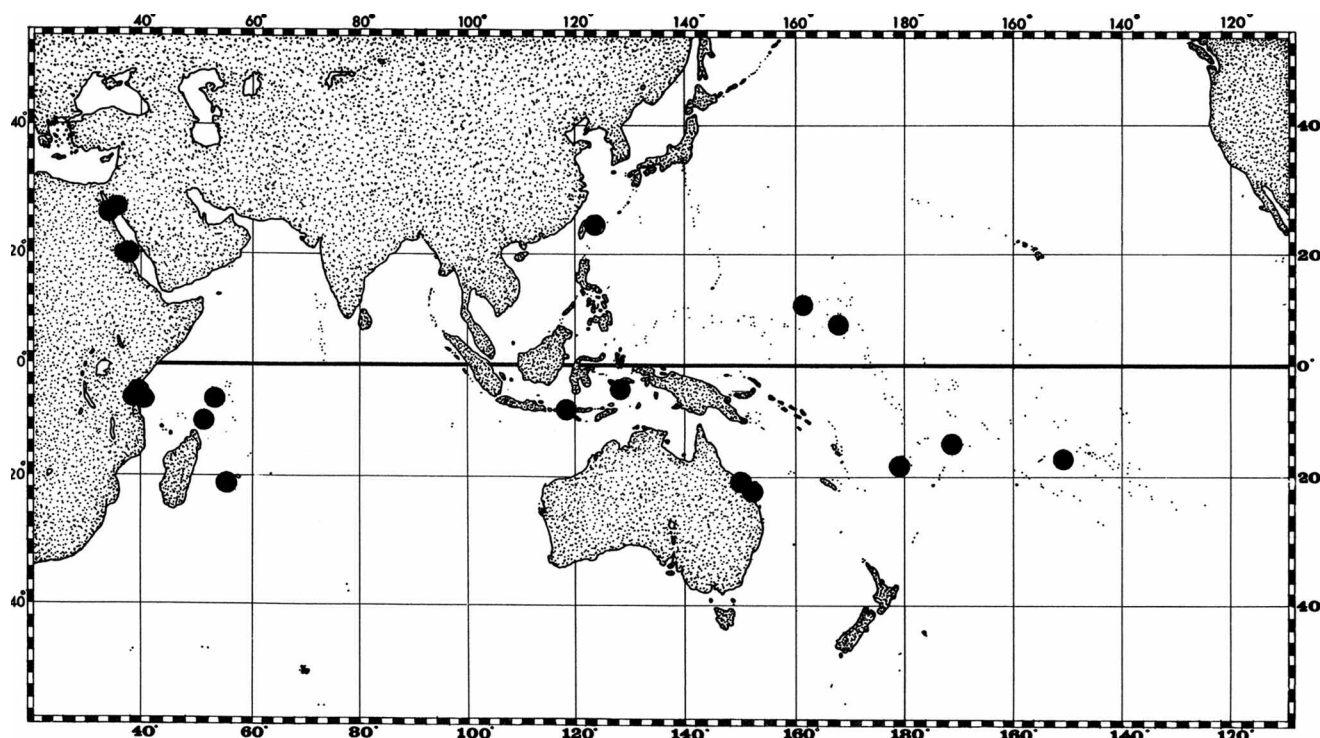


Figure 1. *Paratypton siebenrocki*. Distribution map

Figure 1. *Paratypton siebenrocki*. Carte de distribution

been found in association with: *Acropora hyacinthus* (Dana) (Bruce, 1969 & 1972a), *A. massawaensis* von Marenzeller (Bruce, 1976a), *A. palmerae* Wells (Bruce, 1969 & 1972a), *A. squamosa* (Ehrenberg) (Bruce, 1969 & 1972a), *A. squarrosa* (Ehrenberg) (Bruce, 1969), *A. tubicinaria* (Dana) (Bruce, 1981), and *A. variabilis* (Klunzinger) (Bruce, 1974 & 1980). Hosts have usually been from shallow water situations, to a depth of 14 m (Bruce, 1976a).

Distribution (Fig. 1)

Egypt: Al Qusayr (Balss, 1914; Bruce, 1969), Mersa Sheik (Balss, 1914). **Kenya:** Mombasa (Bruce, 1976a). **Zanzibar:** Chumbe Island (Bruce, 1976a); Chukwani (Bruce, 1976a). **Tanganyika:** Maziwi Island (Bruce, 1976a). **Seychelle Islands:** Farquhar Island (Bruce, 1974); Remire Island, Amirante Islands (Bruce, 1976b). **La Réunion:** La Saline (Bruce, 1980). **Indonesia:** Gorong Island (Bruce, 1983); Sumbawa, Bay off Sanggar (Fransen, 1989). **Japan:** Okinawa, Ryukyu Islands (Nomura et al., 1988); Kuroshima Island and Ishigaki Island, Yaeyama Islands (Hayashi, 2000). **Queensland:** Heron Island (Patton, 1966; Bruce, 1969); Wheeler Reef (Zann, 1980). **Marshall Islands:** Jaluit Atoll (Balss, 1914); Eniwetak Atoll, Rigili Islet (Bruce, 1969). **Fijian Islands:** Great Astrolabe Reef (Bruce, 1981). **Samoa Islands:** Pago Pago

(Borradaile, 1921). **Society Islands:** Moorea (present report).

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