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A new report of the stenopodid shrimp *Stenopus devaneyi* Goy, 1984 from the Western Indian Ocean

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Abstract

The rare stenopodid shrimp, *Stenopus devaneyi* Goy, 1984, is reported for the first time in the Western Indian Ocean (WIO), at 60 m depth at Mayotte Island. No specimens were collected but the species is recognized confidently on photographs based on its characteristic colour pattern: two large red spots on the sides of the second abdominal somite. Selected colour photos are presented. Former Indo-West-Pacific records are listed with an updated map for the geographic distribution of this shrimp. A few ecological observations are made.

Keywords: stenopodid shrimp, *Stenopus*, Mayotte Island, Mesophotic zone

Introduction

The present observation was made during the research programme CRUMMA for the study of the biodiversity of the Crustacea observed in the mesophotic zone (50-150 m) off Mayotte Island (Barathieu, 2023). This programme has been undertaken since 2020 by the association Deep Blue Exploration (DBE) to which the authors of this work belong. CRUMMA is actively supported by the French Museum national d'Histoire naturelle, Paris (INPN, Inventaire National du Patrimoine Naturel), with a research grant obtained in 2021. Previous results include the discovery of a rare cavernicolous crab, *Atoportunus dolichopus* Takeda, 2003 (Barathieu *et al.*, 2019) and a photograph inventory of 44 species observed in the mesophotic zone (Poupin *et al.*, 2022). The description of the diving techniques and methodology used can be consulted in these previous contributions.

During a dive of the first two authors on December 31, 2022, on the east slope of Mayotte Island, southern side of S-shaped Pass, 12°52.964' S, 45°16.557' E, at a depth of 60 m, two stenopodid shrimps with red spots on the sides of the second abdominal somite were photographed (Fig. 1).

These specimens were determined to be *Stenopus devaneyi* Goy, 1984 by using the colouration-based key in Saito *et al.* (2009). The following entries have been selected: 1) Body with striking colour pattern (not uniform); 2) Carapace not purple; 3) Third maxilliped, fourth and fifth pereopods not blue; 4) Pleon with spots; 6) Third pereopod not blue on proximal segment; 7) rostrum not red; 9) Antennal flagellae white; and 10) Pleon with red spots on second and third somites. In addition, the colour pattern given by Goy and Randall (1986: 89) for the redescription of the species matches that of the specimens photographed very well.

The only specimens of *Stenopus devaneyi* that were collected and deposited in Museum collections are those used for the original description: Marquesas, Nuku Hiva Island (Holotype male Bernice P. Bishop Museum, Honolulu, BPBM S8045, Paratype male BPBM S8496); and Sri Lanka (Donated by Hofmann, Senckenberg Museum, Frankfurt, SMF 12200, male paratype).

This shrimp has been rarely cited in the literature since its description. Sasaki's (2022) compilation of



Figure 1. *Stenopus devaneyi* Goy, 1984 photographed at Mayotte Island, December 31, 2022, 12°52.964' S, 45°16.557' E, 60 m. A) pair of shrimps; B) dorsal view; C) lateral view; D) fronto-lateral view. Photographs G. Barathieu.

bibliographic references indicate only a dozen references, half of them being only for lists or text citation, without new places of observation, colour photographs, and/or additional specimens collected. The core references for this rare species are listed below in chronological order, with mention of specimens, colour photographs, place of collection and/or distribution indicated.

Stenopus devaneyi Goy, 1984 (in Debelius, 1984): 117, diagnosis 'Specimens collected from French Polynesia: Marquesas Islands; and Indian Ocean, Sri Lanka'.

Stenopus devaneyi – Debelius, 1984: 17, top photo H. Debelius, 2 specimens, 'Pacific', but probably from Sri Lanka, aquarium; 28, distribution as 'widely distributed and has been seen around both French Polynesia and Sri Lanka'. – Goy and Randall, 1986: 81, 90, figs 1-4; specimens examined, 2 ♂♂ Marquesas, Nuku Hiva, Taiohae Bay, 6.2-22.9 m, and visual observation at Tahuata,

Vaitahu Bay; 1 ♂ Sri Lanka, donated by Hofmann - colour photos pl. 1A, Marquesas, Nuku Hiva, photo JE Randall; pl. 1C, E, 2 specimens, Sri Lanka, aquarium, photo H. Debelius; pl. 1F, Marquesas, Tahuata, photo JE Randall. – Debelius and Baensch, 1994: 552, distribution as 'from Hawaii to the Maldives'; 553, bottom, 2 specimens, colour photo H. Debelius, no place, but probably from Sri Lanka, aquarium. – Walls and Hunziker, 1995: 74, 78, colour figure and colour description, no specimen. – Debelius, 2001: 116, Ari Atoll, Maldives, 2 specimens photo H. Voigtmann; 117, full page, 2 specimens, no place, probably from Sri Lanka, aquarium, distribution as 'From the Maldives eastward to Hawaii. Not known from East Africa or the Mascarenes'.

Several colour photos consulted in Debelius (1984, 2001) and Debelius and Baensch (1994) marine guides are not geographically located. However, after a careful examination of the backgrounds landscapes of these photographs they seem to all be from the same place

which is ‘Sri Lanka, aquarium’ as indicated by Goy and Randall (1986: plate 1, captions of photos C and E).

The presence of *Stenopus devaneyi* in Hawaii, is mentioned only in the distributions indicated by Debelius and Baensch (1994) and Debelius (2001), without specimens collected and/or colour photographs. This must be confirmed as there may be confusion due to there being two types specimens from the Marquesas Islands noted as deposited in the Honolulu Museum. Eldredge and DeFelice (2023) have repeated this Hawaiian record but it is neither indicated in the

With this new record the geographical distribution of *Stenopus devaneyi* is extended 3 530 km westward, from the Maldives to Mayotte Island (Fig. 2) and this shrimp can now be added to the Western Indian Ocean (WIO) list of Stenopodidean compiled by Goy (2023). Its updated geographic and depth distributions are: IWP, from Mayotte (new record), Maldives, Sri Lanka to French Polynesia, Marquesas Islands (Nuku Hiva, Tahuata), between 6-23 m, extended herein to 60 m.

The marked pairing behavior of this species already seen in the literature consulted is confirmed for May-



Figure 2. Geographic distribution of *Stenopus devaneyi* Goy, 1984. Black spots: specimens collected and deposited in Museum collections; white spots: records based on colour photographs and/or field observation; black star: new record documented in this work for Mayotte Island; ?: questionable record; solid line: westward extension range of the species after this work (3 530 km).

checklist of McLaughlin *et al.* (2005; only three Hawaiian *Stenopus*: *earlei*, *hispidus*, *pyrsonotus*) nor in Hoover (2006: 219, 220; same three *Stenopus*) Hawaiian guide for marine invertebrate supplemented by an Internet update (Hoover, 2023; addition of *S. tenuirostris*). In conclusion, the occurrence of *Stenopus devaneyi* in Hawaii cannot be excluded in the view of the wide Indo-West-Pacific (IWP) distribution of several *Stenopus* species but, for the time being, it seems better to remove it from the Hawaiian fauna.

A search on the Internet has failed to reveal additional IWP places of occurrence for *Stenopus devaneyi*. A lot of photographs are for the aquarium trade, sometimes without exact indication for the place of collection. It seems, nevertheless, that the species is rather common around the Maldives and Sri Lanka, with a few Internet photographs indicated from these places.

otte with two specimens seen in the same crevice. The associated fauna recognized on the photographs examined is composed of: encrusting sponges and/or ascidians; a gastropod *Scutus* sp.; an alpheid shrimp, *Alpheus* sp.; a squat lobster *Trapezionida barbeti* (Galil, 1999); and two fishes *Luzonichthys waitei* (Fowler, 1931) and, probably, the reef goby *Priolepis nocturna* (Smith, 1957). Another stenopodid shrimp, *Stenopus pyrsonotus* Goy and Devaney, 1980, was also photographed in a barrel sponge during the same dive, but not in the same crevice with *S. devaneyi*. Goy and Randall (1986: 91) have indicated that it is a “*very retiring species, having been observed only in recesses of the coral*”. They suggest that it is a cleaner shrimp as it was found in close association with the moray eel *Gymnothorax breedeni* (opt. cit. pl. 1F) and that other species of cleaner shrimp, including *Lysmata amboinensis* (De Man, 1888), were often present with *S. devaneyi*. Interestingly,

the association in reef crevices between *S. devaneyi*, a moray eel and the reef goby *Priolepis nocturna* is also documented for the Maldives Island in a Japanese blog consulted on the Internet (<http://sekainoumi.blog54.fc2.com/blog-entry-3056.html?sp>). It is thus possible that the two *Stenopus devaneyi* were sharing their crevice with a moray eel in the Mayotte sighting, but that the eel hid at the sight of the divers.

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