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***Short Communication***

# The first record of the rare stenopodidean shrimp *Engystenopus palmipes* Alcock & Anderson, 1894 (Crustacea: Decapoda) from Southeastern Arabian Sea, India

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In this paper, the first observation of a rare deep-water stenopodidean shrimp, *Engystenopus palmipes* Alcock & Anderson, 1894 (Crustacea: Decapoda) from Southeastern Arabia Sea, India, supplemented with notes on its diagnosis, and geographical distribution, is reported. A single specimen of *E. palmipes* was collected using Expo model trawl net onboard the Fisheries Oceanographic Research Vessel Sagar Sampada from a depth of 610 meters. Previously reported from the Western Pacific, Australia, Madagascar, and off Sri Lanka, this is the first report to the Indian waters.

[**Keywords**: Arabian Sea, Deep-sea, *Engystenopus*, Spongicolidae, Taxonomy]

## Introduction

Stenopodideans are a unique group of colourful shrimp-like crustaceans associated with coral reefs and rocky substrates in shallow waters and muddy substrates of deep-waters[1], and are one of the smallest infraorders of decapods with only about 90 described species under 12 genera in 3 families[2].

The genus *Engystenopus* characterized by a well-developed exopod of the third maxilliped, the elongate merus and carpus of pereopod 3, long, slender and uniunguiculate dactyli of pereopods 4 – 5, and the presence of 2 dorsal carinae on the uropodal endopod was established for a female specimen of *E. palmipes* Alcock & Anderson, 1894 from the Bay of Bengal, off Trincomalee (Sri Lanka)[3]. Alcock[4] provided a thorough description of the species. Saint Laurent & Cleva[5] redescribed this species based on 15 specimens from the Philippines improving the original description with detailed illustrations of diagnostic characters. Later, systematic examination of 3 specimens from the Philippines, 1 each from Tanimbar Island, Indonesia and Madagascar and 2 from Queensland, Australia revealed it to be a rare species throughout its distribution range, and suggested that its morphological proximity with genus *Spongicola* De Haan, 1844 [in De Haan, 1833–1850] is greater than with Family Stenopodidae, resulting in the transference of the genus *Engystenopus* to the family Spongicolidae[6].

Deep-water stenopodidean shrimps are meagerly studied from the Indian waters[3,4,7]. The present paper reports the first observation of the rare deep-sea shrimp *Engystenopus palmipes* from the Arabian Sea, India, supplemented with photographs of diagnostic morphological characters.

## Materials and Methods

The present study area was located in the southeastern Arabian Sea off Trivandrum (8.24° N, 76.49° E), India. A single female specimen was collected on 29 February, 2020 at a depth of 610 m using the Expo model Trawl net during the Cruise No. 398 as part of the regular biodiversity survey of the FORV Sagar Sampada (Fig. 1). Morphological identification was done following Goy[6]. Morphometric characters were measured using the scale tool of the Leica Application Software Leica M80 stereomicroscope fitted with MC170 HD camera, and vernier calliper with an accuracy of 0.01 mm.

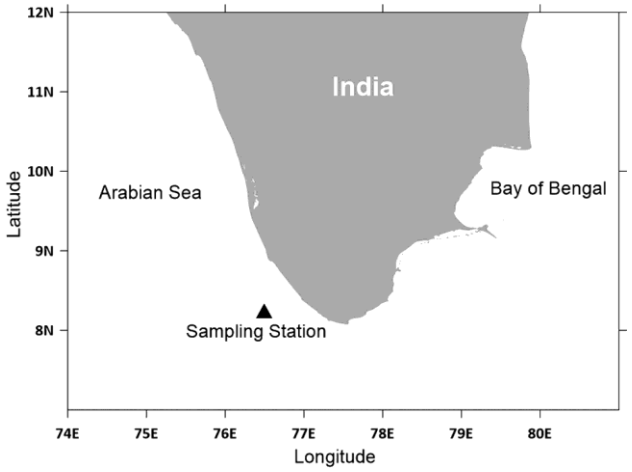


Fig. 1 — Map indicating the geographical location of collection of *Engystenopus palmipes*

Abbreviations used for the morphological characters and other terms are, as follows. FORVSS: Fishery Oceanographic Research Vessel Sagar Sampada; P1 – P5: Pereopods 1 – 5; PCL: Post-rostral Carapace Length; TL: Total Length.

## Results

Order: Decapoda Latreille, 1802

Infraorder: Stenopodidea Spence Bate, 1888

Family: Spongicolidae Schram, 1986

Genus: *Engystenopus* Alcock & Anderson, 1894

*Engystenopus palmipes* Alcock & Anderson, 1894 (Fig. 2)

### Brief description

A small-sized stenopodidean shrimp (PCL 12 mm, TL 32 mm, Fig. 2A) with slightly depressed body. Carapace glabrous, bearing 2 supra-orbital spines (Fig. 2B), rostrum laterally compressed, dorsal teeth 9 (Fig. 2C), and lateral teeth 2 (Fig. 2D).

Antennal scale 4.45 times longer than wide, armed with 2 – 4 teeth distally on outer margin (Fig. 2E).

P1 – P2 missing. P3 longest, only right P3 present, chelate; merus unarmed; carpus long, inflated distally, outer margins with 2 – 3 spines; propodus massive, ventral margin serrated with 5 teeth extending onto pollex, fingers compressed, tapering anteriorly, distal tips bent, crossing in closed position; dactylus subequal in length to upper margin of palm, serrated dorsally, mesial face with scattered spinules proximally. P4 – P5 with 6 carpal and 5 propodal segments.

Pleon smooth, unarmed, somite 3 longest. Telson sub-triangular, dorsal surface with two longitudinal rows of 5 teeth each, lateral margin with 1 spine at midlength, posterior margin bearing 1 median and 2 lateral teeth (Fig. 2F). Uropod length subequal to telson, exopod lateral margin bearing 6 teeth.

Colouration: Body and appendages salmon pink, pereopod dactyli white to semi-transparent; cornea

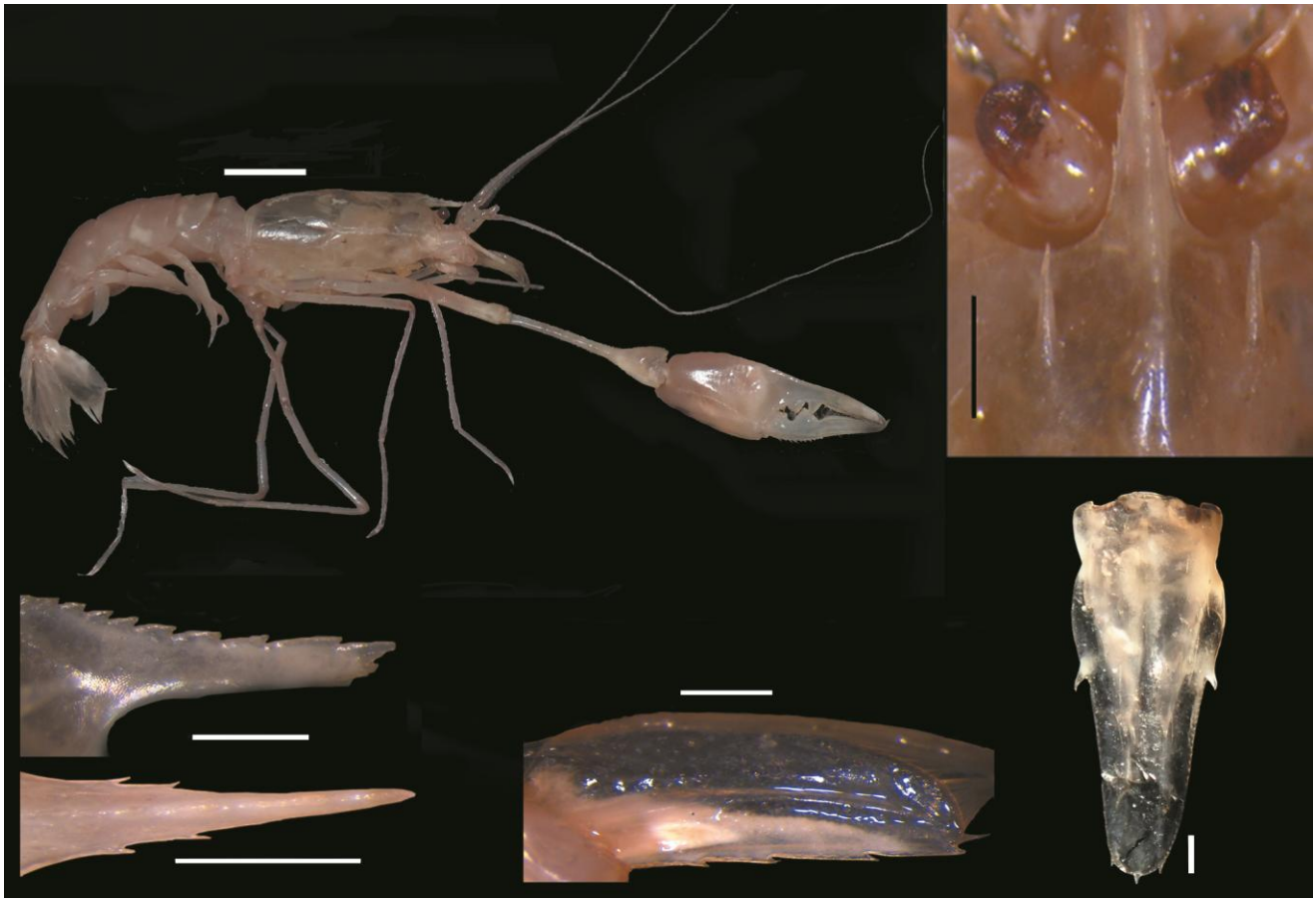

Fig. 2 — *Engystenopus palmipes* Alcock & Anderson, 1894, Female (CL 12 mm, TL 32 mm): A. lateral habitus; B. Carapace dorsal surface indicating the presence of supraorbital spines; C. Dorsal rostral teeth; D. Lateral rostral teeth; E. Antennal scale, dorsal view; and F. Telson. Scale bar: 50 mm (A), 10 mm (B – F)

black; scaphocerite semi-transparent, dorsal third white; telson semi-transparent, uropods salmon and edges transparent.

**Distribution**

Bay of Bengal at 365 – 640 m[ref. 3]; Arabian Sea (present study); off Philippines at 174 – 560 m[refs. 5,6], Indonesia at 399 – 405 m[ref. 6], off Madagascar at 310 – 315 m[ref. 8] and 400 m[ref. 6], off Tanzania at 274 m[ref. 6], off northeastern Australia at 606 – 610 m[ref. 6], off Western Australia at 400 m[ref. 6].

## Discussion

*Engystenopus palmipes* was adequately redescribed and illustrated by de Saint-Laurent & Cleva[5]. Goy[6] reported morphological variations in specimens collected from across the Indo-West Pacific regions. The morphology of the present specimen agreed with Goy's[6] description. The present study reports this species for the first time from Indian waters, adding knowledge to the existing information on the diversity of stenopodidean shrimps of this region. The study also recommends the usage of the Expo model trawl net and High Speed Demersal Trawl (Crustacean Version) net with smaller mesh size, which is effective in crustacean sampling. On the other hand, the possibility of collection by the Naturalist's dredge, with a deep penetration into the substratum[9], and therefore suitable for collecting macrobenthic epifauna[10], also cannot be ruled out in collecting small-sized crustaceans such as *E. palmipes*.

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## Conflict of Interest

Authors declare that there is no conflict of interest regarding the publication of this article.

## Author Contributions

KPA: Investigation, methodology, writing original draft; VPP: Conceptualization, formal analysis, methodology, writing, review & editing; SSC: Conceptualization, project administration, writing, review & editing; and NS: Conceptualization, investigation, project administration, resources, and supervision.

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