

## Occurrence of *Alpheus euphrosyne* de Man, 1897 (Crustacea: Decapoda: Alpheidae) from the South-Eastern Arabian Sea, India

Paras Nath Jha<sup>1\*</sup>, Purushothaman, P.<sup>2</sup>, Chinnadurai, S.<sup>1</sup>, Renjith R.K.<sup>1</sup>, Remesan, M.P.<sup>1</sup>, Baiju, M.V.<sup>1</sup> & Leela Edwin<sup>1</sup>

<sup>1</sup>Fishing Technology Division, ICAR-Central Institute of Fisheries Technology, Cochin, Kerala, India.

<sup>2</sup>Crustacean Fisheries Division, ICAR-Central Marine Fisheries Research Institute, Cochin, Kerala, India.

\*[E mail: parasincof@gmail.com]

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The present study reports the occurrence of the pistol shrimp, *Alpheus euphrosyne* from the South-Eastern Arabian Sea. Identification of the species was based on morphological and molecular examination. One male and two female specimens were collected from the experimental fishing vessel *FV Sagar Harita*, operating in the Arabian Sea off the south-west coast of India during May 2016.

[**Keywords:** Alpheid; *Alpheus euphrosyne*; Marine]

### Introduction

Alpheid shrimps are commonly distributed in tropical and shallow waters<sup>1</sup>. The genus *Alpheus* comprises more than 300 species; *Alpheus* species form symbiotic associations with corals, anemones, sponge, fishes and mangroves<sup>2-10</sup>. Additionally, several species occur in deeper waters<sup>5-11</sup>. In Indian waters, the genus *Alpheus* Fabricius, 1798 comprises 6 species (*Alpheus digitalis*, *Alpheus malabaricus*, *Alpheus miersi*, *Alpheus paludicola*, *Alpheus rapax*, and *Alpheus spongiarum*) although there are chances of more diversity in this area which is unrevealed till now<sup>12</sup>. Among these, all are distributed in shallow and brackish waters at less than 100 m in depth. Presently *Alpheus euphrosyne* de Man, 1897 has a new distribution record from Southeastern Arabian Sea. Very little work on *Alpheus* shrimp has been carried out in and around Indian waters. With this background, it was felt necessary regarding the identification and reporting of the above species found during experimental trawling.

### Materials and Methods

These specimens were collected on board the fisheries research vessel (*FV Sagar Harita*) from the south-eastern coast of Arabian Sea (off Cochin) on 13<sup>th</sup> May 2016 (10° 51' 2.3976" N, 76° 16' 40.2636" E, depth 8.5 m). The collected specimens, preserved in 90-95 % ethanol, were deposited at the Marine Biodiversity Museum at ICAR-Central Marine Fisheries Research Institute, Cochin, India (ID: ED.2.5.1.6).

Genomic DNA was extracted from the pleopods using the DNeasy® Blood & Tissue Kit (Qiagen, Valencia, CA, U.S.A.) according to the manufacturer's protocol. The mitochondrial marker COI (5' barcoding region) was amplified using universal primers<sup>13</sup>. The gene sequences obtained were deposited in NCBI GenBank.

### Result

#### Systematics

Order : Decapoda Latreille, 1802<sup>14</sup>

Infraorder : Caridea Dana, 1852<sup>15</sup>

Family : Alpheidae Rafinesque, 1815<sup>16</sup>

Genus : *Alpheus* Fabricius, 1798<sup>17</sup>

*Alpheus euphrosyne* de Man, 1897 (Fig. 1, 2)

*Alpheus eurydactylus* De Man, 1920: 109 [type locality: Java]<sup>18</sup>



Fig. 1 — *Alpheus euphrosyne* de Man, 1897: Female specimen CL: 15 mm (a), Male specimen CL: 16 mm (b) [Scale bar equal to 10 mm.]



Fig. 2 — Species characters (Male, CL: 16 mm) (a) Dorsal view of rostral appearance, (b) Dorsal view of telson, (c) Dorsal view of major chela, (d) Ventral view of major chela, (e) Dorsal view of minor chela, (f) Ventral view of minor chela [Scale bar equal to 10 mm]

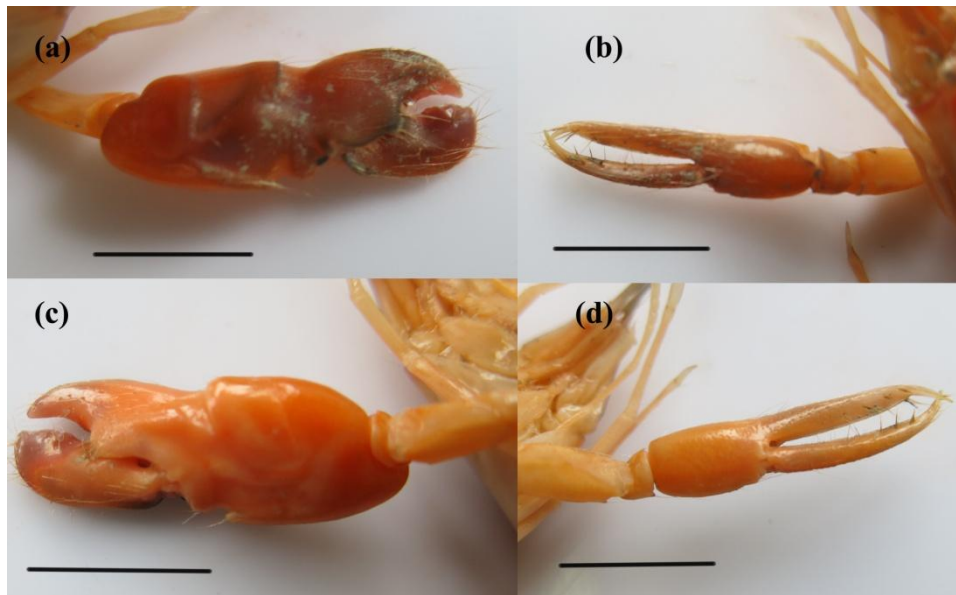


Fig. 3 — Species key characters (Female, CL: 15mm) (a) Dorsal view of major chela, (b) Dorsal view of minor chela, (c) Ventral view of major chela, (d) Ventral view of minor chela [Scale bar equal to 10 mm]

*Alpheus euphrosyne* De Man, 1897:745, pl:36, Fig:64 [type locality: Java Sea];<sup>19</sup> Banner & Banner, 1966:130-133;<sup>20</sup> Thomas M.M., 1976:667;<sup>21</sup> Johnson,

1979:37;<sup>22</sup> Banner A.H. & D.M., 1983:232, Fig. 3<sup>23</sup>  
*Alpheus euphrosyne euphrosyne*— Chace F.A., 1988:466<sup>5</sup>

*Alpheus euphrosyne* – Anker A. & De Grave S., 2016:355<sup>24</sup>

### Material examined

A specimens submitted to Marine Biodiversity Museum at ICAR-Central Marine Fisheries Research Institute, Cochin, India (ID: ED.2.5.1.6); 2 FM (CL: 14, 15 mm), 1 M (CL 16 mm), India: Kerala, Cochin, Sep 2016, Coast of South-eastern Arabian Sea, Depth: 8 – 15 m.

### Diagnosis

Carapace is smooth with minute bristles, the rostrum is short and reaches the base of the first antennular peduncle, post-rostral carina is faint and extends to orbital hoods. Posteriorly adrostral furrows clearly delimited with postrostral carina. Branchiocardiac sulcus was found obscure. The cervical sulcus is reaching up to the hepatic region. A small depression is present in the hepatic region which extends anteriorly. Outer antennular flagella are shorter than inner flagella and gradually segmented. Antennal scale is smooth and straight on the outside, acute distally, with the presence of internal setae, and extends to the distal end of the antennular peduncle. Third maxilliped: base segment broad leaf-like structure and extends to the antennular peduncle. First pereopods: similar proximal to the carpus for both minor and major pereopod, the presence of long setae at interior margins. Major chela 3 times as long as wide and laterally compressed; propodus is broad, stout with two dorsal saddles and long setae, lateral median margins with setae, inferior margin with a well-developed plunger, ventral portion smooth with long setae; dactylus stout and laterally compressed, slightly long compared to a fixed finger. Minor chela (male) is 5 times as long as wide and fingers are sub-equal to the length of palm, dactylus distinctly balaeniceps; minor chela (female) is 4.3 times as long as wide and fingers are slightly longer than the palm. Second pereopod slender compared to other pereopod, with 9-10 segments, and 3/4<sup>th</sup> length of outer antennular flagella. Third pereopod is little stout and not extended to antennular peduncle. Fourth and fifth pereopod are little stout and equal to the length of the third pereopod characterized by the absence of spine. Abdomen smooth dorsally. Telson is equal in length of uropods, with the rounded distal end and smooth setae.

### Discussion

Banner and Banner<sup>13</sup> provided a brief description and identifying characters for *A. euphrosyne*. Present

specimens are closely similar to the holotype with little variation. Major chela and minor chela are 2.5 times and 5 times longer than the width in male while in female minor chela is little smaller than the specimens in Banner and Banner.<sup>13</sup> The second pereopod of the collected specimen has 9-10 articles. Examined specimens are smaller in size [2 FM (CL: 14, 15 mm, TL: 41.8, 41 mm), 1 M (CL: 16 mm, TL: 43 mm)], than those reported by Thomas<sup>15</sup> (CL: 18.1 to 19.5 mm), and Chace<sup>5</sup> (CL: 20.7 to 21.8 mm). However, specimens are larger than Banner and Banner's description<sup>13</sup> [1 M (TL: 35 mm)]. Two female specimens were sequenced for the 5' barcoding region of the mitochondrial gene; COI were successfully amplified with universal primers<sup>13</sup> and were submitted to NCBI GenBank (Accession Numbers: KY673259, KY673260).

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