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## The Red Sea species of *Cymo* de Haan, 1833 (Decapoda, Brachyura, Xanthidae), associates of scleractinian corals

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### Abstract

Four species of *Cymo*, associates of scleractinian corals, from the Red Sea were studied using scanning electron and light microscopy. Characters based on the morphologies of the carapace, gonopods and digestive tract (gastric teeth) were investigated and described in detail. All Red Sea species are redescribed, distinguishing characters are identified and an identification key is provided. *Cymo quadrilobatus* is the most distinctive species, with prominent granules on the carapace and most of the surfaces of the chelipeds and walking legs, and four red spots on the dorsal surface of the carapace in contrast to the smooth or finely granular surfaces in the other three species. *Cymo deplanatus* is listed as new record for the Red Sea.

**Key words:** Xanthidae, *Cymo*, taxonomy, Red Sea, coral associates, morphology, gastric teeth

### Introduction

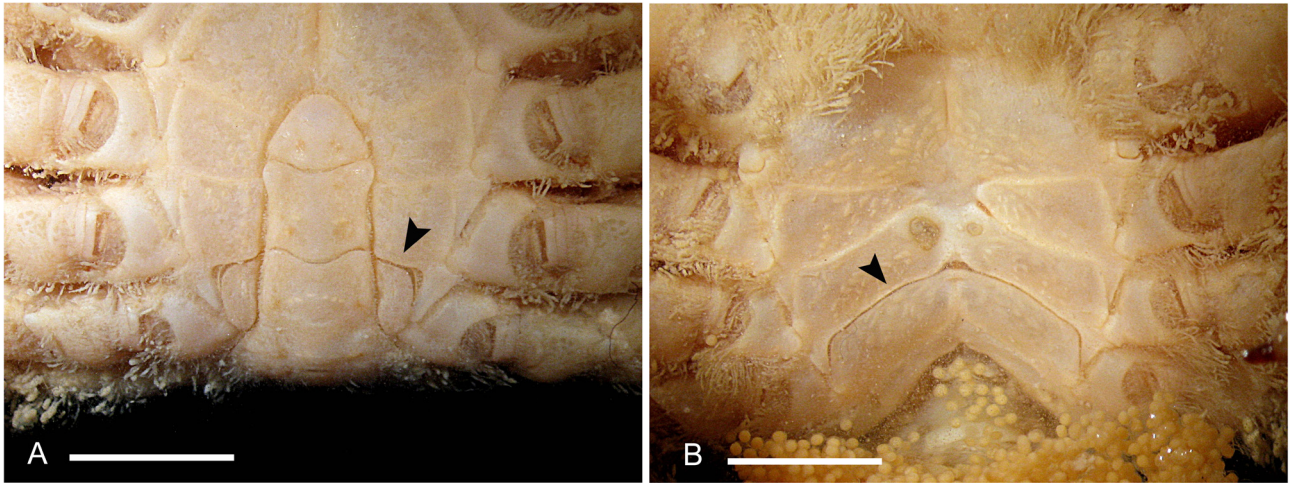
The facultative coral-symbiotic crab genus *Cymo* De Haan, 1833, occurs predominantly in acroporid and pocilloporid scleractinians (Castro 1976, Serène 1984, Goh *et al* 1990). It currently includes eight species (Ng *et al*, 2008), of which three (*C. andreosyi* (Audouin, 1826), *C. melanodactylus* Dana, 1852, and *C. quadrilobatus* Miers, 1884), have been previously recorded from the Red Sea. A fourth species, *C. deplanatus* (A. Milne-Edwards, 1873), was found in the Gulf of Aqaba (V. Neumann and R. Diesel, unpublished data), Sanganeb Atoll (D. Fiege, F. Krupp and V. Neumann, unpublished data) and recently recorded from Northern Red Sea, near Gayal by the first author. We here reappraise the Red Sea species of *Cymo*. Only references to Red Sea records are included in the synonymies.

Thorough morphological examination of recent material revealed the variability of some previously used characters (e.g., morphologies of the frontal margin and carapace and colouration of the chelipeds), which sometimes made identification difficult. Therefore, all Red Sea species are redescribed, distinguishing characters are identified and an updated identification key is provided.

The hitherto undescribed morphology of the gastric teeth is presented for all species as additional data towards a better understanding of the brachyuran foregut construction.

### Material and methods

During this study 149 specimens of *Cymo* were examined. These specimens are deposited in the collections of the Senckenberg Research Institute (SMF) and the Marine Museum of the King Abdul Aziz University in Jeddah (KAUMM). The KAUMM collection is presently kept at SMF and will be transferred to Jeddah once storage facilities are available.



**FIGURE 15.** *Cymo melanodactylus*, A, male; B, female (ZMG 1218), sternites with open sutures between sternite 6 and 7 indicated by arrows. This character is also present in *C. andreossi*, *C. deplanatus* and *C. quadrilobatus*. Scale bars: A, B = 500  $\mu$ m.

### Key to Red Sea species of *Cymo*

1. Frontal margin lined with coarse, blunt granules of irregular sizes; dorsal surface of carapace, cheliped carpus and palm with similarly shaped granules usually in clusters; front appears quadrilobed (Fig.14D) ..... *C. quadrilobatus*
- Frontal margin and chelipeds with pointed spines, front bilobed ..... 2
2. Carapace of nearly circular shape, frontal margin with bifurcated spines, fingers of cheliped of white or black colour ..... 3
- Carapace slightly longer than wide, frontal margin with relatively longer frontal spines than in the other three species (Fig. 14B); fingers of chelipeds of gray or pale colour ..... *C. deplanatus*
3. Frontal margin with two bifurcated spines on each lobe (Fig. 14A), entire chelipeds ..... *C. andreossi*
- Frontal margin with one bifurcated spine on each lobe (Fig.14C), fingers of larger cheliped black but distally white, black colouration on pollex extending onto male palm. .... *C. melanodactylus*

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