

## A morphological anomaly in *Clausocalanus mastigophorus* (Claus, 1863) (Copepoda, Calanoida) from St. Peter and St. Paul Archipelago

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Received: November 22, 2012 – Accepted: May 16, 2013 – Distributed: August 31, 2014  
(With 1 figure)

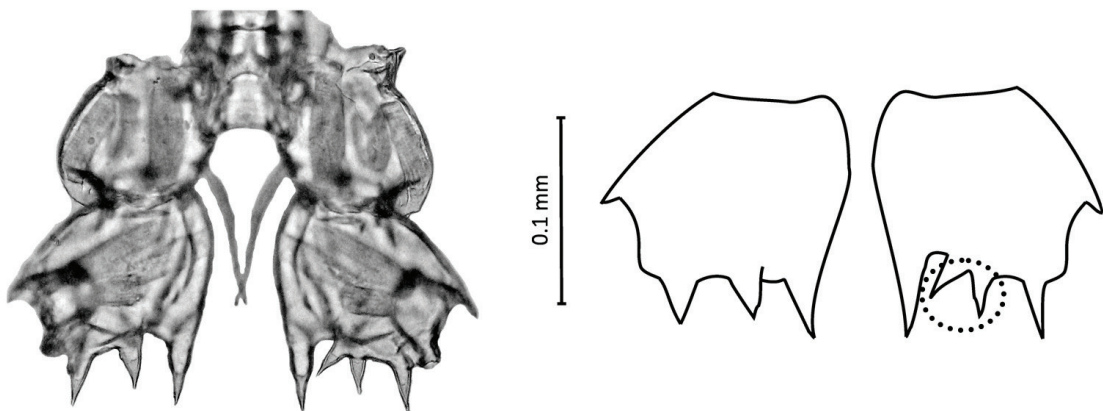
Copepods are key species in pelagic marine environments. They act as a link between primary producers and fish and also as predators of other major consumers (Gismervik, 2006). These organisms are the most abundant and diverse constituents of the marine mesozooplankton and the principal secondary producers in marine food webs (Shimode et al., 2006), and they can represent up to 80% of the biomass of planktonic metazoans in these environments (Kiørboe, 1997). Among Copepoda, Calanoida are noteworthy because they are relatively abundant and diverse under certain conditions (Stephen, 1984). The genus *Clausocalanus* is one of the most common and abundant genera of calanoids in the oceans, primarily in tropical and subtropical regions (Cornils et al., 2007). In South Atlantic waters, this genus is represented by 12 species (Boltovskoy, 1999). Among these species, *Clausocalanus furcatus* (Brady, 1883) occupies a dominant position due to its high abundance and frequency. Among the other species of the genus occurring in the South Atlantic is *Clausocalanus mastigophorus* (Claus, 1863), an epipelagic species that is commonly found in warm shallow waters (Peralba and Mazzocchi, 2004).

Morphological abnormalities are commonly observed in several planktonic crustaceans (Dias, 1999; Martinelli-Filho et al., 2009; Sousa et al., 2011). With their great

abundance and diversity, copepods are very susceptible to these anomalies (Bayly and Shiel, 2008; Gusmão and McKinnon, 2009). Various causes are associated with these malformations, such as the presence of ecto- and endoparasites, food limitation, UVB radiation and pollution (Lacuna and Uye, 2001; Gusmão and McKinnon, 2009).

An important taxonomic characteristic of *Clausocalanus* species is the bases of P2 and P3, which bear spiniform processes distally (Frost and Fleminger, 1968). Despite minor variations in ornamentation, females of all species of *Clausocalanus* have only three spines at the base of P3. These spines vary in their relative size, width and distribution in the P3 base.

The present study reports the first observation of a malformation in a female of *C. mastigophorus*. The specimen was collected between depths of 40 and 60 m near the St. Peter and St. Paul archipelago (SPSPA) (Equatorial Atlantic). This malformation consists of an additional median thorn at the base of the right P3 of the specimen (Figure 1). This anomaly produced an asymmetry in P3 in this individual. The specimen exhibited 3 and 4 spines at the base of the left P3 (normal) and the right P3 (anomalous), respectively.



**Figure 1.** Photo and schema of anomaly observed at the base of P3 of a female of *Clausocalanus mastigophorus* in a sample collected at the Archipelago of St. Peter and St. Paul. Note the presence of an additional process in the right P3.

Cornils et al. (2007), studying the Clausocalanidae of the Red Sea, recorded the development of 1 or 2 additional articles in the fifth pair of legs (P5) on various species of the genus *Clausocalanus*. The authors suggest that this anomaly can be related to parasitic infestation. However, the results of the current study failed to reveal any sign of infestation, either in the anomalous individual or in any other individual of the same genus in the samples. Moreover, no other species in the samples presented any type of anomaly.

The cause of the malformation observed in the anomalous *C. mastigophorus* is most likely attributed to an error of development or related to random genetic mutations because major anomaly-causing man-made agents have not been observed in the SPSPA, an area uninfluenced by any type of pollution. Studies on the rates of occurrence of this and other types of anomalies should be performed relative to the possible morphologic spectrum that certain species may present or even in terms of the possible ecological impact of anomalous individuals on these populations.

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