A CASE OF LEG MALFORMATION IN THE ATLANTIC GHOST CRAB
OCYPODE QUADRATA (DECAPODA, BRACHYURA, OCYPOLIDAE)

BY
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INTRODUCTION


In the Crustacea, putative processes or conditions causing malformations include injuries (e.g., on the carapace: Dexter, 1954; Riedl, 1975; Shelton et al., 1981); parasitic diseases, including viral infections (Primavera & Quinitio, 2000); somatic mutations or the erroneous result of morphogenetic processes (von Vau-pel Klein & Koomen, 1993); contaminants (Weis et al., 1992); and exposure to extreme environmental conditions such as low temperatures (Pandourski & Evtvimova, 2009).

In decapods, malformations are commonly reported for the chelipeds, with lateral processes having been recorded in Carcinus maenas (Linnaeus, 1758) (cf. Heerebout, 1969); Erimacrus isenbeckii (Brandt, 1848), Chionoecetes opilio (Fabricius, 1788) (cf. Suzuki & Odawara, 1971); Procamarus clarkii (Girard, 1852) (cf. Nakatani et al., 1992); Paralithodes camtschaticus (Tilesius, 1885) (cf. Nickerson & Gray, 1963); Menippe mercenaria (Say, 1818) (cf. Ros & Quiñones, 1981) and Pachycheles serratus (Benedict, 1901) (cf. Lira et al., 2003), among others. Chelipeds are commonly used as weapons during agonistic interactions and to halt attacks by predators. Thus, injuries (subsequently producing malformations) might be expected in chelipeds with a greater frequency than in other body appendages like maxilipeds or walking legs. Furthermore, chelipeds are the

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last part of the body to be detached from the exuvium (old exoskeleton) during moulting. Thus, any problem during moulting may potentially result in chelipeds deformations, as well. Other structures that may suffer malformations in decapods include the carapace (Dexter, 1954), rostrum (De Grave, 1999; Aguirre & Hendrickx, 2005; Follesa et al., 2008), thoracic sternites (Heerebout, 1969), abdomen (Heerebout, 1969; Mantelatto et al., 2000), telson (De Grave, 1999; Aguirre & Hendrickx, 2005) and walking legs (Ros & Quiñones, 1981).

This study describes abnormalities found on the walking legs (thoracopods 5-8) of a specimen of *Ocypode quadrata* (Fabricius, 1787) from Isla Margarita, Venezuela.

During March 2008, *Ocypode quadrata* was collected as a part of a preliminary inventory of the decapods of Juangriego Bay, Isla Margarita, Venezuela. Sampling was carried out from November 2007 to March 2008 and a total of 85 specimens were collected.

A single intermoult female (carapace width = 31.5 mm and carapace length = 26.0 mm) exhibited abnormalities on the dactyl (distal segment of the limb) of each walking leg. Each dactyl had a small subdistal projection on its flexor margin that extending diagonally, making the dactyl bifid (fig. 1), the maxilliped and chelipeds were normally developed. The specimen is deposited in the carcinological collection of the Escuela de Ciencias Aplicadas del Mar, Universidad de Oriente, Venezuela (catalogue number GIC-712).

As pointed out above, malformations in decapods are commonly found on the chelipeds. It is thought that the conditions causing them are injury-related (Suzuki & Odawara, 1971; Okamoto, 1991; Nakatani et al., 1992). In support of this claim, it has been found that experimental injuring of the chelipeds produces lateral outgrowths in *Procambarus clarkii* (cf. Nakatani et al., 1992). As the malformation herein described is symmetrical and is present on all walking legs, it is suggested that the current malformation is related to a genetic condition and not to teratological injuries (compare, e.g., Von Vaupel Klein & Koomen, 1993). Other abnormalities described for walking legs in decapods include a triple regeneration of the last left appendix of a blue crab, *Callinectes sapidus* Rathbun, 1896 (cf. Lawler & Van Engel, 1973), the modification of the last pair of walking legs into chelipeds of a specimen of *Menippe mercenaria* (cf. Ros & Quiñones, 1981), the presence of an extra appendage as attached to the propodus-carpus segments of the pereiopod, the fourth on the right side of a *Maja crispata* Risso, 1827 (cf. Carmona-Suárez, 1990) and the development of a trifid dactyl on the second left walking leg of a specimen of *Chionoecetes opilio* (cf. Motoh, 2002).

Balazuc (1948, 1969) provided a classification and terminology for many of the malformations reported for the Coleoptera. Abnormalities of the appendages are