

Occurrence of shell disease and carapace abnormalities on natural population of *Neohelice granulata* (Crustacea: Varunidae) from a tropical mangrove forest, Brazil

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In this note, we registered the occurrence of shell diseases and carapace abnormalities on a natural population of *Neohelice granulata* from a tropical mangrove forest, in South America, as a part of a wide ecological study. The occurrence of 32 adult crabs (1.77%) with black or brown spotted shell, or deformities on carapace was registered, collected in the autumn and winter seasons. The low prevalence of shell diseases and abnormalities in this natural population is considered normal and probably caused by injuries occurred during the moult period of crabs.

Keywords: *Neohelice granulata*, shell disease, carapace abnormalities

INTRODUCTION

Shell diseases and external abnormalities or deformities are just one of the common problems affecting freshwater and marine crustaceans. These diseases have been reported in many natural crustacean populations, principally in many species of economic importance such as the Alaskan king crab, portunid crabs, shrimps and lobsters (Maloy, 1978; Sindermann, 1989; Noga et al., 2000).

The shell diseases are characterized by various types of erosive lesions on the carapace (Johnson, 1983; Sindermann & Lightner, 1988) and the classical and most common kind of shell disease is known as 'brown spot' or 'black spot', which consists of various-sized foci of hyperpigmentation (Rosen, 1970; Noga et al., 2000). These diseases in crustaceans have been associated with many infectious agents. While fungi have been occasionally involved, the great majority of cases have been linked to many bacteria, primarily *Vibrio* (Sindermann, 1989; Prince et al., 1993; Hameed, 1994; Abraham & Manley, 1995; Aguado & Bashirullah, 1996).

External abnormalities or deformities in crustaceans are not rare and the most common problems are modifications on chelipeds (Morgan, 1923; Shuster Jr et al., 1963; Zou & Fingerman, 2000; Benneti & Negreiros-Fransozo, 2003), carapace spines (Moncada & Gomes, 1980), pereopods (Lawler & Engel, 1973) and the abdomen form (Mantellato et al., 2000). In these cases, these alterations could be attributed to genetic factors (Zou & Fingerman, 2000) or accidents that occurred during the moulting process (Moncada & Gomes, 1980).

The semiterrestrial crab *Neohelice granulata* (Dana, 1851) (= *Chasmagnathus granulata*) is an important gregarious burrowing species in intertidal areas from tropical and subtropical estuaries, from South America. It occurs in the occidental Atlantic Ocean: Brazil (from Rio de Janeiro to Rio Grande do Sul States), Uruguay and Argentina (Melo, 1996) and all information for this species are devoted to subtropical and salt marsh populations, without available occurrences up to date about shell disease and external abnormalities.

The purpose of this note is to present information about the occurrence of shell diseases and abnormalities on a natural population of *Neohelice granulata* from a tropical mangrove forest, in South America.

MATERIALS AND METHODS

From April 2003 to March 2004, the crabs were monthly sampled during low tide periods, in the mangrove of Jabaquara beach, Paraty, Rio de Janeiro State, Brazil (23°13'04"S and 44°42'47"W), as a part of a wide ecological study. Crabs were manually captured from their burrows or walking on the muddy bottom. We utilized the capture per unit effort, with two collectors simultaneously sampling in the same site for 15 min each, scanning an area of approximately 5 m², at three points along the mangrove river margin.

Crabs were kept in plastic bags and refrigerated until they were analyzed. In the laboratory, the sex of each crab was assessed by abdomen morphology observation (presence of gonopod in males or plumose pleopods in females). The carapace width (CW) of each specimen was measured with a digital caliper (0.01 mm).

RESULTS AND DISCUSSION

A total of 1801 crabs were captured: 846 males, 732 females, 182 ovigerous females and 41 non-sexable individuals. The occurrence of 32 adult crabs (1.77%) with any type of shell disease (black/brown spotted shell) or deformities on carapace was registered (Figure 1). These individuals are collected in autumn (April 6 males and 2 females; May 1 male and 4 females) and winter (July 1 male and 6 females; August 4 males and 9 females). No ovigerous females were registered with carapace abnormalities or shell diseases. The mean size of these crabs was 26.52 ± 7.4 mm CW, (range: 15.5–34.4 mm CW).

The shell diseases have been reported in many crustacean natural populations, although the prevalence, as in this case, has usually been very low (Noga et al., 2000). High prevalence of shell disease has been associated with stressful environments, such as intensive aquaculture, impounded populations or polluted natural environments (Sindermann, 1989; Prince et al., 1993; Ziskowski et al., 1996).

The pathogenesis of shell disease is thought to be multifactorial and strongly influenced by mechanical damage (Cook & Lofton, 1973; Malloy, 1978; Young & Pearce, 1975; Alderman, 1981; Sindermann, 1989); carapace abnormalities probably results by injuries occurred during molting (Moncada & Gomes, 1980).

These carapace injuries can be caused by predator's attack, for example by migratory shorebirds (Iribarne & Martinez, 1995), or cannibalism, which occurs in this species (Luppi et al., 2001). *Neohelice granulata* lives in dense groups, where juveniles live near coespecific adults in separate burrows, but usually juvenile and adult burrows are interconnected (Spivak et al., 1994). Probably, this gregarious habit can intensify these non-lethal injuries and posterior chitinoclastic activities of invading agents.

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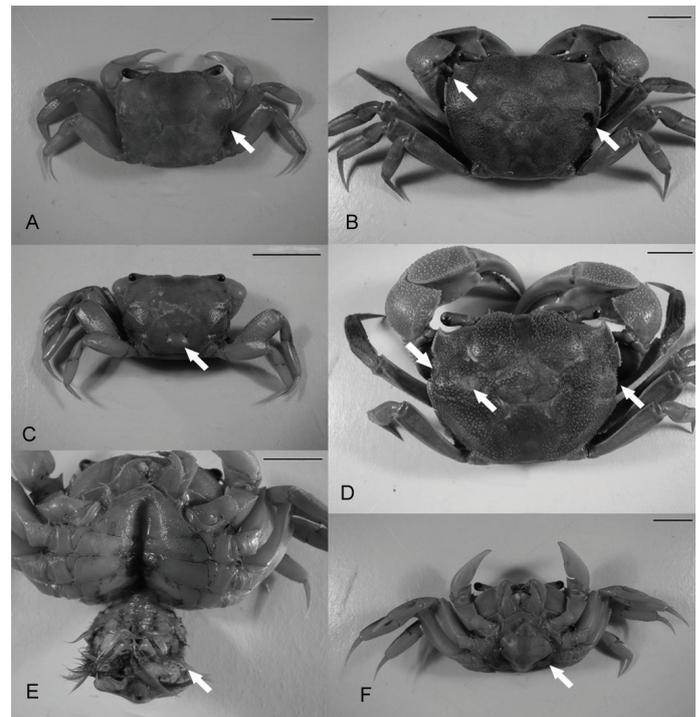


Figure 1. Examples of shell disease and external abnormalities or deformities on *Neohelice granulata* natural population: A, C, females with carapace abnormality; B, D, males with modifications on carapace spines and black/brown spots; E, F, female with external abnormality in the abdomen. Scale bars: 1 cm.

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