



Range extensions for three majoid crabs (Crustacea, Decapoda, Brachyura) on the coast of São Paulo state, Brazil

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Abstract. This study reports range extensions of three species of crabs to the northern coast of the state of São Paulo. The species obtained were *Inachoides forceps*, *Microphrys antillensis* and *Mithraculus sculptus*. Recent new records of marine species in Brazilian waters illustrate the importance of continuous investigations on the biodiversity of subtidal rocky bottoms.

Key Words: New record, Majoidea, Southwestern Atlantic, ballast water, biogeographic barrier

Resumo. Ampliação da distribuição geográfica de três caranguejos majóideos (Crustacea, Decapoda, Brachyura) na costa do Estado de São Paulo, Brasil. Este estudo trás a ampliação da distribuição geográfica de três espécies de caranguejos para a costa norte de São Paulo. As espécies obtidas foram *Inachoides forceps*, *Microphrys antillensis* e *Mithraculus sculptus*. Registros recentes de espécies marinhas em águas brasileiras ilustram a importância de investigações contínuas da biodiversidade do sublitoral consolidado.

Palavras-chave: Nova ocorrência, Majoidea, Atlântico sudoeste, água de lastro, barreira biogeográfica

The geographic distributions of marine animals are the result of complex natural processes and are shaped over geological time. The geographical dispersal of marine invertebrates, especially those with larval development, follows the ocean currents, and their distribution patterns are constrained by the biological and ecological characteristics of the species (Alves *et al.* 2006). Enlargements of geographical distributions of decapod crustaceans have been recorded continually in many regions worldwide (*e.g.* Dwilistyo & Ng 2000, Lovrich *et al.* 2002, Tavares & Melo 2004), including several records for the Brazilian coast (*e.g.* Costa *et al.* 2000, Cobo *et al.* 2002, Tavares & Amouroux 2003, Melo & Boehs 2004, Alves *et al.* 2006).

Here we provide new records extending the geographical distributions for three species of majoid crabs, *Inachoides forceps* A. Milne

Edwards, 1879, *Microphrys antillensis* Rathbun, 1920, and *Mithraculus sculptus* (Lamarck, 1818) to the coast of the state of São Paulo, Brazil.

The material examined was obtained during dive sessions at Grande and Itaguá beaches (23°28'02''S-45°03'37''W and 23°27'07''S-45°02'49''W) at Ubatuba and Vitória Island (23°44'04''S-45°01'35''W), on Ilhabela, located on the northeastern coast of São Paulo, Brazil. The crabs were caught between June 2001 and December 2005. In the laboratory the specimens were identified to species level, according to Melo (1996), sexed, and measured for carapace width (CW). The brachyurans were classified according to Ng *et al.* (2008). All the crabs were preserved in 70% ethanol and deposited in the Carcinology Collection of the Museu de Zoologia da Universidade de São Paulo (MZUSP).

Three species of brachyuran crabs belonging to the superfamily Majoidea, were identified, and the southern limits of their distribution were extended. These species are *Inachoides forceps*, *Microphrys antillensis*, and *Mithraculus sculptus*. Figure 1 indicates the previously recorded southern limits of distribution, as well as the present records.

Inachoididae Dana, 1851

Inachoides forceps A. Milne Edwards, 2001

Material examined: one specimen, juvenile female, CW 2.8 mm (MZUSP 16479).

Material obtained: 02/2003, Itaguá Beach, Ubatuba São Paulo State.

Previously known distribution: Western Atlantic – North Carolina to Florida, Gulf of Mexico, Antilles, Guiana and Brazil (from Amapá to Rio de Janeiro)

Majidae Samouelle, 1819

Microphrys antillensis Rathbun, 1920

Material examined: 16 specimens - two juvenile males, two adult males, two adult females, and 10 ovigerous females. CW ranging from 3.4 to 9.0 mm (MZUSP 18035, 18036, 18037, 18038).

Material obtained: 02/2004 – 12/2005, Vitoria Island, Ilhabela, São Paulo State.

Previously known distribution: Western Atlantic – North Carolina, Florida, Gulf of Mexico, Antilles, and Brazil (from Paraíba to Rio de Janeiro) (Melo 1996).

Mithraculus sculptus (Lamarck, 1818)

Material examined: 6 specimens - two juvenile females, one juvenile male, one adult female, and two ovigerous females, CW ranging from 3.6 to 12.4 mm (MZUSP 18039).

Material obtained: 06/2001, Grande beach, Ubatuba, São Paulo State.

Previously known distribution: Western Atlantic – Florida, Gulf of Mexico, Antilles, and Brazil (from Rio Grande do Norte to Bahia) (Melo 1996).

The records of *I. forceps*, *M. antillensis*, and *M. sculptus* for the northeast coast of São Paulo State extend the southern limits of their distributions, in two cases significantly. The

hydrological and biogeographical characteristics of the Brazilian coast may explain these new records. The southeast Brazilian coast is an area of hydrological and faunal transition (Melo 1990, Boschi 2000), and is influenced by several different water masses according to the season of the year (Mesquita *et al.* 1979, Matsuura 1986, Silva *et al.* 2004). The seasonality of these water masses may cause some changes in the structure of the coastal communities, by changing abiotic parameters such as temperature and salinity, as recorded by Pires (1992), as some species that has its distribution restricted over SACW influence as the majoid crab *Stenocionops spinosissima* (Saussure, 1857) and the sea lilies *Neocomatella pulchella* (Zimmerman, 1982). In addition, some species from other geographical provinces may arrive on the northeast coast of São Paulo following the water masses in favorable conditions (Melo 1990).

The region of Cabo Frio on the northeast coast of Rio de Janeiro State is an upwelling area, where the cold water acts as an ecological filter for thermophilic species (Melo 1990, Boschi 2000). However, the influence of this cold water mass at Cabo Frio varies over the year, modified especially by the winds (Ikeda *et al.* 1974, Ikeda 1976, Matsuura 1986, Gomes 2006). The record of *M. antillensis* and *I. forceps*, for the coast of São Paulo was to be expected, representing only a delayed record, because the previous southern limit for these crabs was just north of the present record, with no biogeographical filters or barriers that could prevent its dispersal. According to Tavares & Amouroux (2003), the ballast water has a great potential to transport larvae and could be responsible for the introduction of *M. sculptus*, passing through the Cabo Frio upwelling area and establishing on the northeastern coast of the São Paulo State. However, the ballast water is an alternative hypothesis that remains as an open question.

We cannot assess the length of time that these species might have been present on the northeastern coast of São Paulo. The small size of these crabs, some of which show cryptic behavior, may also have led to delays in updating their geographical distributions. Recent new records of marine species in Brazilian waters illustrate the importance of continuous investigations on the biodiversity of subtidal rocky bottoms.

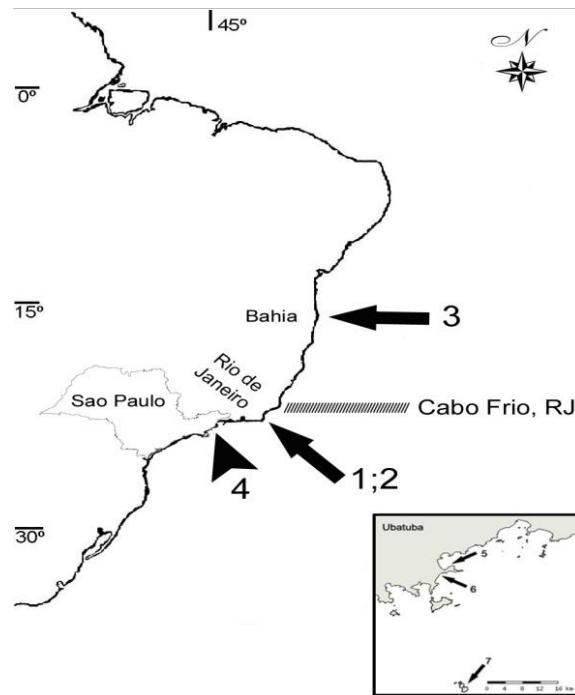


Figure 1. Previous southern distribution limits in the western Atlantic Ocean for *Inachoides forceps* (arrow 1); *Microphrys antillesis* (arrow 2) and *Mithraculus sculptus* (arrow 3). Present South Atlantic distribution limits for these species (arrow 4).

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