

Yet another record of *Scylla serrata* Forsskål, 1775 (Crustacea: Decapoda: Portunidae) from the western Atlantic

Cassiana Baptista Metri^{1,3}; Pablo Damian Borges Guilherme^{1,4} & Marcos Tavares²

¹ Universidade Estadual do Paraná, Programa de Pós-Graduação em Ciências Ambientais – Ambientes Litorâneos e Insulares. Paranaguá, PR, Brasil.

² Universidade de São Paulo (USP), Museu de Zoologia (MZUSP). São Paulo, SP, Brasil.

ORCID: <http://orcid.org/0000-0002-7186-5787>. E-mail: mdst@usp.br (correspondence author)

³ ORCID: <http://orcid.org/0000-0001-6432-4280>. E-mail: cassiana.metri@unespar.edu.br

⁴ ORCID: <http://orcid.org/0000-0001-7471-6907>. E-mail: pablo.borges@unespar.edu.br

Abstract. The Indo-Pacific edible swimming crab *Scylla serrata* is reported here for the fifth time from the western Atlantic including a failed attempt of introduction to Florida for aquaculture purposes in the years 1960's. The species had been recorded from Brazil in the early 1980's and in 2011 and from the Caribbean coast of Colombia in 2013. The capture of a third specimen in southeastern Brazil on 24 August 2020 is discussed here. On all occasions individuals found in Brazil were adults captured alive near port areas. The occurrence of *S. serrata* in disparate time periods in the western Atlantic (1983, 2011, 2013 and 2020) is regarded as an indication of low inoculation pressure.

Key-Words. Giant mud crab; Alien marine species; Shipping; *Charybdis hellerii*; Indo-Pacific; Brazil.

INTRODUCTION

Swimming crabs of the genus *Scylla* De Haan, 1833 disappeared from the Atlantic Ocean since the Miocene (Rathbun, 1935; Via, 1941; Veiga Ferreira, 1954). The genus, currently restricted to Indo-Pacific waters, consists of four species, among which *Scylla serrata* Forsskål, 1775 (see Keenan *et al.*, 1998; Bockerhoff & McLay, 2011, and references therein). Recently, however, *S. serrata* has been transported to new areas through man's mediation. Intentional introductions were attempted in Florida and Hawaii for aquaculture purposes. These intentional attempts failed in Florida (Park, 1969), but succeeded in Hawaii, where *S. serrata* became established (Carlton & Eldredge, 2009). *Scylla serrata* has also been inoculated thrice into the western Atlantic likely as a result of shipping activities, namely in Brazil (Peruibe, in 1983; Sepetiba in 2011) and Colombia (Cartagena Bay, 2013) (Melo, 1983; Tavares & Mendonça Jr., 2011; Lemaitre *et al.*, 2013). The capture of a third specimen found alive on the southeastern Brazilian coast, is discussed here.

MATERIAL AND METHODS

One large male of *Scylla serrata* (Figs. 1A; 2A-C) was caught alive in a gill net by fishermen Ruan

Carlos do Rosário Ribeiro and Izair Cassilha Ribeiro at a depth of about 1.5-4 m at Saco do Tamarutaca, Paranaguá Bay, southeastern Brazil (approximately 25°26'24"S, 48°26'23"W) (Fig. 1B). The specimen (carapace length and width, cl 183,03 mm × cw 119,06 mm, respectively) is deposited at the



Figure 1. (A) *Scylla serrata* (Forsskål, 1775), carapace length and width cl 183,03 mm × cw 119,06 mm, respectively (MZUSP 41291). Male captured by fishermen on 24 August 2020 at Saco do Tamarutaca, Paranaguá Bay, Paraná, Brazil. (B) General aspect of Saco do Tamarutaca, Paranaguá Bay, Paraná, Brazil.

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Museum of Zoology, University of São Paulo (MZUSP 41291). A number of fouling organisms were observed on it.

Comparative material

Scylla serrata: Brazil: 1 female, cl 148 mm, cw 238 mm (MZUSP 24232), off Sino Beach (approximately 23°04'53"S, 44°00'30"W), Marambaia Island, Sepetiba Bay, State of Rio de Janeiro, around 9 m. 1 female, cl 152 mm, cw 220 mm (MZUSP 5310), Peruíbe, State of São Paulo, around 15 m. French Polynesia: 1 male, 1 female (MZUSP 37623), Huahine, stn R14, Society Islands, J. Poupin coll., don., reefs.

RESULTS AND DISCUSSION

Taxonomy

The male of *Scylla serrata* from Paranaguá Bay agrees well with the comparative material (listed above) and with the diagnoses, color pattern and illustrations provided by Keenan *et al.* (1998).

Possible vectors and point of entry

The vector of introduction of *S. serrata* in the Paranaguá Bay is unknown, but possibilities include shipping activities, including but not limited to live adults carried on board ship as fresh food and possibly discarded intentionally or unintentionally into the harbor (see also Tavares & Mendonça Jr., 2011; Lemaitre *et al.*, 2013). Indeed, the Paranaguá Bay is home to the Paranaguá Port (25°30'07.0"S, 48°30'43.2"W), which is likely the point of entry for *S. serrata*. The port is the largest exporter of agricultural products from Brazil and the Bay is known to host a number of alien and cryptogenic species (Neves & Rocha, 2008; Rocha & Kremer, 2005; Tavares, 2011), including a well-established population of the Indo-West Pacific *Charybdis hellerii* (A. Milne-Edwards, 1867). A single specimen of the alien swimming crab, *Liocarcinus navigator* (Linnaeus, 1758) was captured alive also off the coast of Paranaguá (Tavares & Rössener, 2019).

Single and occasional records

It has been submitted that single and occasional records of invasive species possibly represent an ear-



Figure 2. Male *Scylla serrata* (Forsskål, 1775) (MZUSP 41291). (A) Habitus, dorsal view. (B, C) Mesial and lateral views of the left cheliped. Scale bars: (A) 50 mm. (B, C) 30 mm.

ly warning for human-mediated connectivity between donor and receiver areas, while the frequency of catches possibly represent a reflection of the level of inoculation pressure (Tavares & Rössener, 2019). Indeed, the occasional presence of the Indo-West Pacific *C. hellerii* in the western Atlantic (WA) in 1965, preceded in several years the establishment of self-sustained populations of *C. hellerii* in the WA in the late 1980's.

The occurrence of *S. serrata* in disparate time periods in the western Atlantic might be an indication of low inoculation pressure. The species is not established in the western Atlantic. However, these occurrences being in localities rather close to one another in Brazil is of interest as an indication of southeastern Brazil as a potential receiver area for this species in the southwestern Atlantic.

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