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New records of two swimming crabs (Crustacea: Decapoda: Portunidae) from Northeastern Brazil

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Abstract

The swimming crabs *Portunus anceps* (Saussure, 1858) and *P. floridanus* Rathbun, 1930 (Portuninae) have been only recorded in Western Atlantic. The present study reports the first record of *Portunus anceps* at Rocas Atoll and the second record of *Portunus floridanus* in Brazilian waters. Additionally, we report an extension of the bathymetric distribution of *Portunus anceps*, until 510 m deep in Rocas Atoll. The records of these species are an important advancement for the geographic distribution about the Portunidae family in Atlantic Ocean and increase the knowledge of crustacean biodiversity in Northeast region of Brazil.

Keywords: *Portunus anceps*, *Portunus floridanus*, geographic distribution, oceanic island, Portuninae

1. Introduction

The subfamily Portuninae Rafinesque, 1815 [1] includes about 130 species distributed in 11 genera [2], most of which are distributed in the tropical and subtropical regions [3]. The members of this family occur mostly in shallow waters in estuary, sand or mud beaches and oceanic islands [1, 3, 4].

In Brazilian waters, the genus *Portunus* Weber, 1795 [5] is represented by four species: *Portunus anceps* (Saussure, 1858) [6], *P. floridanus* Rathbun, 1930 [7], *P. sayi* (Gibbes, 1850) [8] and *P. ventralis* (A. Milne-Edwards, 1879) [9] [2, 4] distributed along the coast. However, the occurrence of *P. anceps* is restricted to the Brazilian continental shelf and oceanic islands of Abrolhos, Trindade and Martin Vaz Archipelago, while the *P. floridanus* was recorded only once from state of Paraíba [10]. This paper reports the first occurrence of *P. anceps* at Rocas Atoll and the second record in Brazil of *P. floridanus* that occurred in the Potiguar Basin.

2. Materials and Methods

Samples were collected from two different areas. In the Potiguar Basin, located in Northeast Brazil (03/05° S; 38/35° W), onboard the R/V Seward Johnson in May 2011 under the framework of the project “Avaliação da biota Bentônica e Plancônica da Bacia Potiguar e Ceará (Bpot)”, developed by the Brazilian Oil Company “Petróleo Brasileiro S/A (Petrobrás)”. During this survey, samples were collected on the continental slope using a semi-balloon otter bottom trawl with 50 mm mesh size and 18 m of mouth opening, with stations ranging between 150–2130 m depth [11].

In Rocas Atoll (3°51'S 33°49'W), samples collected on the framework of the ABRACOS (Acoustic along the Brazilian coast) survey, onboard the R/V Antea in October 2015, using a pelagic micronektonic trawl (mesh size of 1 mm) at sampling depth varying between 10–650 m [11].

After both campaigns, the specimens were sorted out and preserved in 70% alcohol and thereafter identified to species level [2, 3]. For all specimens the carapace widths (CW) were measured using a digital caliper (0.01 mm). All the material was deposited in the Carcinological Collection of the "Museu de Oceanografia Prof. Petrônio Alves Coelho (MOUFPE)" at the Federal University of Pernambuco.

3. Results and Discussion

Geographic distribution new records are in bold.

3.1 Systematics

Order Decapoda Latreille, 1802 ^[12]
 Family Portunidae Rafinesque, 1815 ^[1]
 Subfamily Portuninae Rafinesque, 1815 ^[1]
 Genus *Portunus* Weber, 1795 ^[5]

3.2 *Portunus anceps* (Saussure, 1858) ^[6]
 (Fig. 1A, B)

Synonyms

Lupea anceps Saussure 1858:434, pi. 2, figs. 11-1 lb ^[6].
Portunus (Achelous) anceps — Hay & Shore 1918:431, pl. 33, fig. 8 ^[13].
Portunus (Portunus) anceps — Rathbun 1930:42, pl. 15 ^[7].
Portunus anceps — Williams 1965:163, fig. 145 ^[14]. —
 Coelho & Ramos 1972:186 ^[15]. — Powers 1977:82 ^[16]. —
 Williams 1984: 387, fig. 302 ^[3]. — Manning & Chace, 1990:
 52 ^[17]. — Melo 1996: 324 ^[4]. — Cintra *et al.* 2003: 65 ^[18]. —
 Melo & Veloso, 2005: 800 ^[19]. — Almeida *et al.* 2007: 33 ^[20].
 — Rodrigues *et al.* 2017: 7, fig. 4 ^[2]. — Tavares *et al.* 2017:
 171 ^[21].

Material examined: 38 Males (CW: 2–5 cm), 12 Females (CW: 3–8 cm), Rocas Atoll, ST#14, 0–510 m, 06 October 2015, 03°58,97' S, 34°03,37' W, MOUFPE: 18257.

Diagnosis: Carapace twice wider than long, pubescent, with several indistinct, arching, granulate, transverse ridges. Frontal region with six teeth, median teeth shortest one, submedian teeth largest one, and lateral frontal teeth 1 blunt. Posterior anterolateral tooth sharp, slender, and about as long as space occupied by four preceding teeth, tip trending forward. Chelipeds long; merus with four spines in front, a distal spine behind; carpus ridged, with strong inner and a smaller outer spine. Merus of swimming leg with postero-distal margin oblique, unarmed.

Distribution: Western Atlantic – Bermudas, USA (North Carolina to Florida), Gulf of Mexico, (USA, Florida to Mexico, Cancun), Cuba, Antilles, Colombia and Brazil (States of Amapá, Pará, Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, Trindade and Martin Vaz Archipelago and Rocas Atoll). Central Atlantic – Ascension.

Bathymetric distribution: The specimens were found in Rocas Atoll between the depths of 0–510 m in midwater hauls, while its previous distribution was reported between 14–125 m depth. Thus, the present study extends its bathymetric distribution to deeper waters.

Remarks: The species of *Portunus anceps* was observed on substrates of sand, mud, under shells and rocks, and on algae in tropical waters. Still, *P. anceps* has reduced size and can also be found in the water column as occurred in our case. Here we report the presence of *P. anceps* for the first time in Rocas Atoll in Northeast Brazil, increasing its geographic distribution on Brazilian waters.

3.3 *Portunus floridanus* Rathbun, 1930 ^[7]
 (Fig. 1, C, D)

Synonyms

Portunus (Achelous) floridanus Rathbun, 1930:82, pl. 40 ^[7].
Portunus floridanus — Powers 1977:83 ^[17]. — Williams 1984:388, Fig. 340 ^[3]. — Abele & Kim 1986: 53,575,585 ^[22]. — Ramos-Porto *et al.* 2000: 170 ^[10]. — Rodrigues *et al.* 2017: 7, Fig. 4 ^[2].

Material examined: 14 Males, (CW: 9 - 12 cm), 7 Females (CW: 7 - 9 cm), Potiguar Basin, AR#55, 150 m, 04° 34,31' S, - 036° 54,48' W, 08 December 2009, MOUFPE: 18253. 21 Males (CW: 8 - 13 cm), 7 Females (C W: 6 - 10 cm) and 1 Ovigerous female (CW: 9 cm), Potiguar Basin, AR# 53a, 04° 41, 41' S, - 036° 34, 55' W, 07 December 2009 MOUFPE: 18255. 19 Males (CW: 10 - 13 cm), 14 Females (CW: 9 - 11 cm) and 6 Ovigerous Females (CW: 10 - 12 cm), Potiguar Basin, AR# 53b, 04° 41, 41' S, - 036° 34, 55' W, 08 December 2009 MOUFPE: 18256. 2 Males (CW: 8 - 9 cm), Potiguar Basin, MT#52-2, 04° 44,89' S, - 036° 25,45' W, 21 May 2011, MOUFPE: 18254.

Diagnosis: Carapace narrows, with many short setae, inconspicuous, without strong ridges, but with extensive pattern formed by tracts of fine granules. Frontal region with six teeth; median teeth shortest one, submedian teeth blunt and largest than others, and lateral frontal teeth 1 triangular, similar in shape to submedian teeth, and with a single conspicuous central fissure on upper orbital margin. Posterior anterolateral tooth short, strong, larger than adjacent teeth, tips trending forward. Chelipeds long, granulate, with ridges; merus with three to five spines on anterior border and small curved spine at distal end of posterior border; carpus ridged and finely granulate, small outer spine and broad inner spine larger than propodal spine at articulation. Merus of swimming leg longer than wide, armed distally along posterior margin with row of spinules.

Distribution: Western Atlantic: USA (North Carolina- Cape Lookout) to Honduras and Nicaragua, Antilles, Surinam and Brazil (States of Rio Grande do Norte - Potiguar Basin - and Paraíba).

Bathymetric distribution: The specimens were found in Potiguar Basin between depths of 150–180 m, being included in its previous distribution of 9–640 m depth even if this species is more common between 60–80 m.

Remarks: The species of *Portunus floridanus* inhabits substrates of sand, mud, coral bottom ^[3, 10]. The specimens were collected in the shelf break in 4 out of 30 samples in the Potiguar Basin but only closed to the isobath of 150 m. *P. floridanus* has a disjunctive geographical distribution along the Brazilian coast, probably due to the low sampling effort in areas beyond the shelf break. The present study report the presence of *P. floridanus* for the second time from Brazilian waters, filling the gap of distribution in this area and increasing the knowledge on crustacean biodiversity in Northeast Brazil.

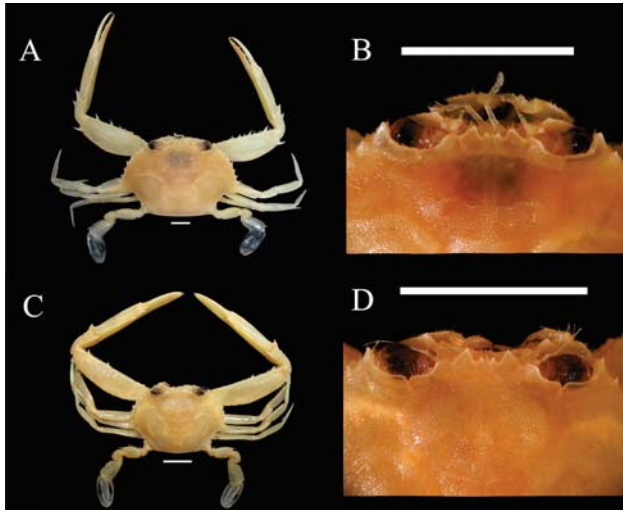


Fig 1: *Portunus anceps* (Saussure, 1858), female, dorsal view (A), front view (B), (MOUFPE: 18257), and *Portunus floridanus* Rathbun, 1930, female, dorsal view (C), front view (D), (MOUFPE: 18253), from northeastern Brazil. Scale bar = 1 cm.

In the present study, *Portunus anceps* females were larger than males, a characteristic previously observed for *Portunus* (*Portunus*) *pelagicus* (Linnaeus, 1758) [24] in Indonesia [23] and *Callinectes ornatus* Ordway, 1863 [26] in Bermuda [25]. On the contrary, males of *Portunus floridanus*, were larger than females. A result similar to what have been observed in *Achelous spinimanus* (Latreille, 1819) [28] in Ilha do Frade, State of Espírito Santo, Brazil [27], for *Callinectes danae* Smith, 1869 [30] in Florianópolis, State of Santa Catarina [29], for *C. danae* from Santa Cruz Channel, State of Pernambuco [31], and *Arenaeus cribrarius* (Lamarck, 1818) [33] in Ubatuba, State of São Paulo [32].

The distribution of *Portunus anceps* is widely known along Brazilian coast [2, 4, 19, 21]. However, the records in Rocas Atoll fill a gap in Brazilian waters increasing knowledge on the geographic and bathymetric distributions of this species since its vertical range of distribution was expanded to deeper waters. This occurrence in deeper water may be related to reproductive periods, when adult females can move offshore for reproduction [34], but in this case, in deeper waters around Rocas Atoll.

Portunus floridanus may have a wider distribution along the Brazilian coast than the previous record [10] and our present record indicate, because of the low sampling effort and the difficulty to access to regions beyond the shelf break in Brazil. Thus, higher sampling efforts are necessary, to increase the distributional and biological knowledge on these crabs in Brazilian waters.

In conclusion, the present study fills gaps on the distribution of the genus *Portunus* along the Brazilian coast through the second record of *Portunus floridanus* in Brazilian waters (State of Rio Grande do Norte) and the occurrence of *Portunus anceps* in Rocas Atoll.

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