Pesquisa e Ensino em Ciências Exatas e da Natureza
2(1): 60–66 (2018)
Research and Teaching in Exact and Natural Sciences

ARTICLE

ISSN 2526-8236 (online edition)
Pesquisa e Ensino em Ciências Exatas e da Natureza

UFCG - Campus de Cajazeiras - PB.

New records of two species of *Acanthocarpus* Stimpson, 1871 (Crustacea: Decapoda: Calappidae) in northeastern Brazil

Flavio de Almeida Alves-Jr.[1], Ângela Ferreira Pereira[2] & Marina de Sá Leitão Câmara de Araújo[2]

(1) Universidade Federal de Pernambuco, Centro de Tecnologia e Geociência, Departamento de Oceanografia, Programa de Pós-Graduação em Oceanografia, Av. Arquitetura, Cidade Universitária 50740-550, Recife, Pernambuco, Brazil. E-mail: bioflavio@hotmail.com

(2) Universidade de Pernambuco, Faculdade de Ciências, Educação e Tecnologia de Garanhuns, Departamento de Ciências Exatas e Naturais, Magano 55294-902, Garanhuns, Pernambuco, Brazil. E-mail: mslc.araujo@gmail.com

Alves-Jr. F.A., Pereira Â.F. & Araújo M.S.L.C. (2018) New records of two species of *Acanthocarpus* Stimpson, 1871 (Crustacea: Decapoda: Calappidae) in northeastern Brazil. *Pesquisa e Ensino em Ciências Exatas e da Natureza*, 2(1): 60–66. http://dx.doi.org/10.29215/pecen.v2i1.581

Novos registros de duas espécies de *Acanthocarpus* Stimpson, 1871 (Crustácea: Decapoda: Calappidae) no nordeste do Brasil

Resumo: O caranguejo do gênero *Acanthocarpus* Stimpson, 1871 tem hábitos bentônicos, ocorrendo na plataforma continental em substratos de cascalhos ou lamosos com ocorrência em todos os oceanos, especialmente entre 20-522 m de profundidade. Neste trabalho, nós reportamos a ocorrência de *Acanthocarpus alexandri* Stimpson, 1871 e *A. bispinosus* A. Milne-Edwards, 1880 para a Bacia Potiguar (Rio Grande do Norte), localizada na região nordeste do Brasil e aumentamos o conhecimento sobre aspectos distribucionais das espécies para a costa brasileira.

Palavras chave: Bacia Potiguar, registros adicionais, distribuição geográfica, caranguejos braquiúros, plataforma continental.

Abstract: The gladiator box crab of the genus *Acanthocarpus* Stimpson, 1871 has benthonic habits, occurring in continental shelf on gravel or muddy substrates with occurrence in all oceans, especially between 20-522 m depth. In this paper we report the occurrence of *Acanthocarpus alexandri* Stimpson, 1871 and *A. bispinosus* A. Milne-Edwards, 1880 from the Potiguar Basin (Rio Grande do Norte), located in the Brazilian northeast and increase the knowledge about the distributional aspects of this species from Brazilian coast.

Key words: Potiguar Basin, further records, geographic distribution, brachyuran crabs, continental shelf.

Introduction

The family Calappidae De Haan, 1833 is composed by 9 genera, with individuals occurring in all oceans, especially in continental shelf on muddy or gravel substrates, may be found under shells and rocks in costal zones (Melo 1996; Melo *et al.* 1998; Ng *et al.* 2008; Melo 2010). In Brazil, the family is represented by 3 genera: *Acanthocarpus* Stimpson, 1871; *Calappa* Weber, 1795; and *Cycloes* De Haan, 1837 (Melo *et al.* 1998; Ramos-Porto *et al.* 2002; Rodrigues & Young 2003).

The genus *Acanthocarpus* contains five species: *Acanthocarpus alexandri* Stimpson, 1871; *Acanthocarpus bispinosus* A. Milne-Edwards, 1880; *Acanthocarpus brevispinis* Monod,

Academic editor: Silvio F. B. Lima. **Received**: 10 May 2018. **Accepted**: 04 June 2018. **Published**: 06 June 2018.

1946; *Acanthocarpus delsolari* Garth, 1973 and *Acanthocarpus meridionalis* Mané-Garzon, 1980, but only two species (*A. alexandri* and *A. bispinosus*) have been recorded from Brazilian waters by Melo (1996), Abreu *et al.* (2002), Ramos-Porto *et al.* (2002), Rodrigues & Young (2003), Coelho *et al.* (2008) and Melo (2010). Thus, in this paper, we report the occurrence of *Acanthocarpus alexandri* and *A. bispinosus* from Potiguar Basin, located in the Brazilian northeast and increase the distributional knowledge of these species in Brazil.

Material and Methods

The samples were carried out in the Potiguar Basin, located in the northeast region of Brazil, between the states of Ceará (CE) and Rio Grande do Norte (RN), under the framework of the project "Avaliação da Biota Bentônica e Planctônica da Bacia Potiguar e Ceará (Bpot)", developed by the Brazilian Oil Company "Petróleo Brasileiro S/A (Petrobras)", on board of the R/V Luke Thomas in December 2009 with stations "Arrasto Malha Talude (#AR)" and R/V Seward Johnson in May 2011, referred as "Malha Talude (#MT)". The specimens were collected through of the bottom trawls along the continental slope, using a semi-balloon otter trawl net with 50 mm mesh size and 18 m of mouth opening, between 150–2068 m depth.

After the sampling, the specimens were preserved in ethanol 70% and in the laboratory, the individuals were identified based on Rathbun (1937), Williams (1984) and Melo (1996). The carapace length (CL) and carapace width (CW) were measured using a digital caliper (0.01 mm). The specimens collected in Potiguar Basin were deposited in the Carcinological Collection of the "Museu de Oceanografia Prof. Petrônio Alves Coelho (MOUFPE)", in the "Universidade Federal de Pernambuco", Recife, Pernambuco, Brazil.

Results and Discussion

Systematic

Calappidae De Haan, 1833
***Acanthocarpus* Stimpson, 1871**
***Acanthocarpus alexandri* Stimpson, 1871**
(Figure 1)

Material examined: 2 ♂ (CL: 310 mm, 330 mm; CW: 280 mm, 310 mm), Potiguar Basin (Rio Grande do Norte) #MT #AR 55, 04°44' S, 036°25' W, 180 m depth, bottom temperature 28.8° C, 08.XII.2009, MOUFPE 18768.

Diagnosis: Carapace ovate, regularly convex with a short posterolateral spine. Surface of carapace covered with minute granules and punetae. Posterior margin arcuate, bearing a prominent tooth at middle and a slight wave in the outline on each side. Posterolateral margin not tuberculate. The spine at outer angle of merus longer than half the width of carapace; the superior spine is one-fourth to one-third as long as the inferior. Ambulatory legs naked, unarmed, with smooth polished surface (modified from Rathbun 1937).

Geographic distribution: Western Atlantic: Canada, United States (Massachusetts, North Carolina to Florida), Gulf of Mexico, Cuba, Porto Rico, Lesser Antilles, Dry Tortugas, and Brazil (Piauí, Rio Grande do Norte [present study], Bahia, Espírito Santo, Rio de Janeiro and Rio Grande do Sul) (Melo 1996; Abreu *et al.* 2002; Ramos-Porto *et al.* 2002; Rodrigues & Young 2003; Coelho *et al.* 2008; Melo 2010) (**Figure 3**).

Bathymetric distribution: *Acanthocarpus alexandri* was collected at 180 m depth, which is within the known depth range of the species (20-480 m) of previously recorded by Ramos-Porto *et al.* (2002) and Rodrigues & Young (2003).

Comments: *Acanthocarpus alexandri* occurs exclusively in the continental shelf on gravel or mud substrates, with records in coastal zone around 20 m (Rodrigues & Young 2003; Melo 2010; Mullowney *et al.* 2011). According to Melo (1996, 2010) and Haefner (1981), the species can be carnivore opportunist feeding on organisms of the infauna. *Acanthocarpus alexandri* was first recorded from the Brazilian northeast in the States of Piauí and Bahia by Ramos-Porto *et al.* (2002), since then there have been no further records of the species in the region. Thus, the material from Potiguar Basin (Rio Grande do Norte) represents the second record of the species in the Brazilian northeast and diminishes the distribution gap of the species in the Brazilian coast (**Figure 3**).

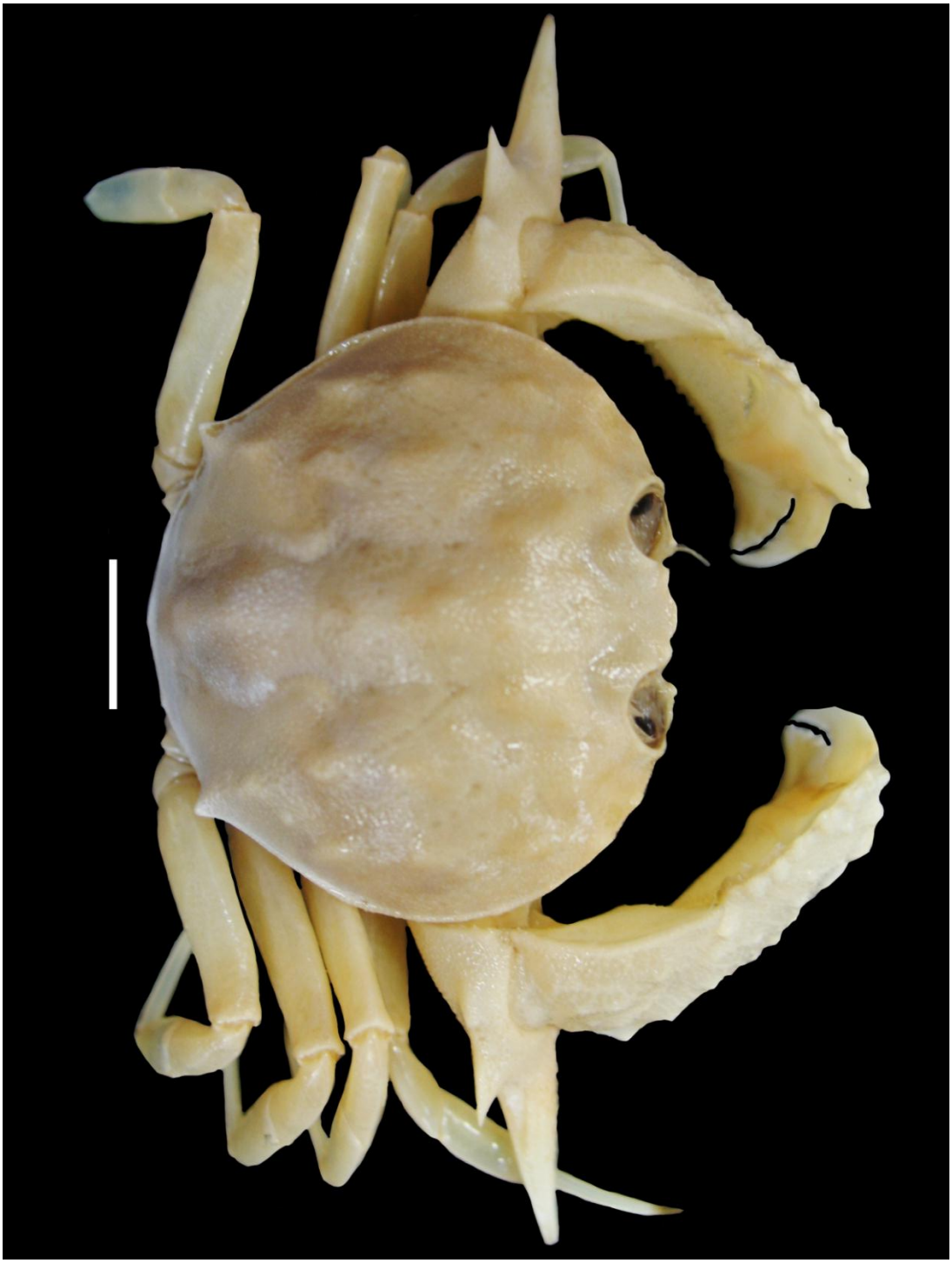

Figure 1. *Acanthocarpus alexandri* Stimpson, 1871, male, Rio Grande do Norte, Potiguar Basin #AR 55, 180 m depth, MOUFPE 18768. **Scale bar**: 1 cm.

Acanthocarpus bispinosus A. Milne-Edwards, 1880 (Figure 2)

Material examined: 3 ♂ (CL: 550 mm, 490 mm, 520 mm; CW: 480 mm, 420 mm, 470 mm), Potiguar Basin (Rio Grande do Norte) #MT 63, 04°36' S, 36°45' W, 400 m depth, bottom temperature 34.6° C, 13.V.2011, MOUFPE18766. 2 ♀ (CL: 420 mm, 410 mm; CW: 380 mm, 340 mm), Potiguar Basin (Rio Grande do Norte) #MT 65, 04°33' S, 36°52' W, 400 m depth, bottom temperature 34.7° C, 13.V.2011, MOUFPE 18767.

Figure 2. *Acanthocarpus bispinosus* A. Milne-Edwards, 1880, male, Rio Grande do Norte, Potiguar Basin #MT 63, 400 m depth, MOUFPE 18766. **Scale bar**: 1 cm.

Diagnosis: Carapace circular, strong granulate with a long lateral spine. Surface of carapace covered of coarsely granulated. Posterior margin less produced on median line. Posterolateral margin tuberculate. No tooth on posterior margin and no conical tubercle on sternal plastron. Chelipeds showing merus with long spine; coarsely granulate, outer crest not prominent; striate of stridulating ridge about 60 points. Ambulatory legs finely granulated, especially in ventral margin (modified from Rathbun 1937).

Geographic distribution: Western Atlantic: United States (Florida), Gulf of Mexico, Lesser Antilles, Grenadines Island, Dry Tortugas, Brazil (Rio Grande do Norte [present study], Pernambuco, Sergipe, Bahia) (Powers 1977; Abreu *et al.* 2002; Ramos-Porto *et al.* 2002; Rodrigues & Young 2003; Serejo *et al.* 2007) (**Figure 3**).

Bathymetric distribution: *Acanthocarpus bispinosus* was collected at 400 m depth, which is within the known depth range of the species (200-522 m) of previously recorded by Ramos-Porto *et al.* (2002) and Rodrigues & Young (2003).

Comments: *Acanthocarpus bispinosus* occurs on gravel or muddy substrates in the continental shelf, but can also be found under rocks, corals and shells. In Brazil, the species has been reported only from the northeast region in the states of Pernambuco, Sergipe and Bahia (Abreu *et al.* 2002; Ramos-Porto *et al.* 2002; Rodrigues & Young 2003). The material from Potiguar Basin (Rio Grande do Norte) constitutes the new northernmost record of the species in the country, increasing the distribution of the species by 4° degrees of latitude from Pernambuco.

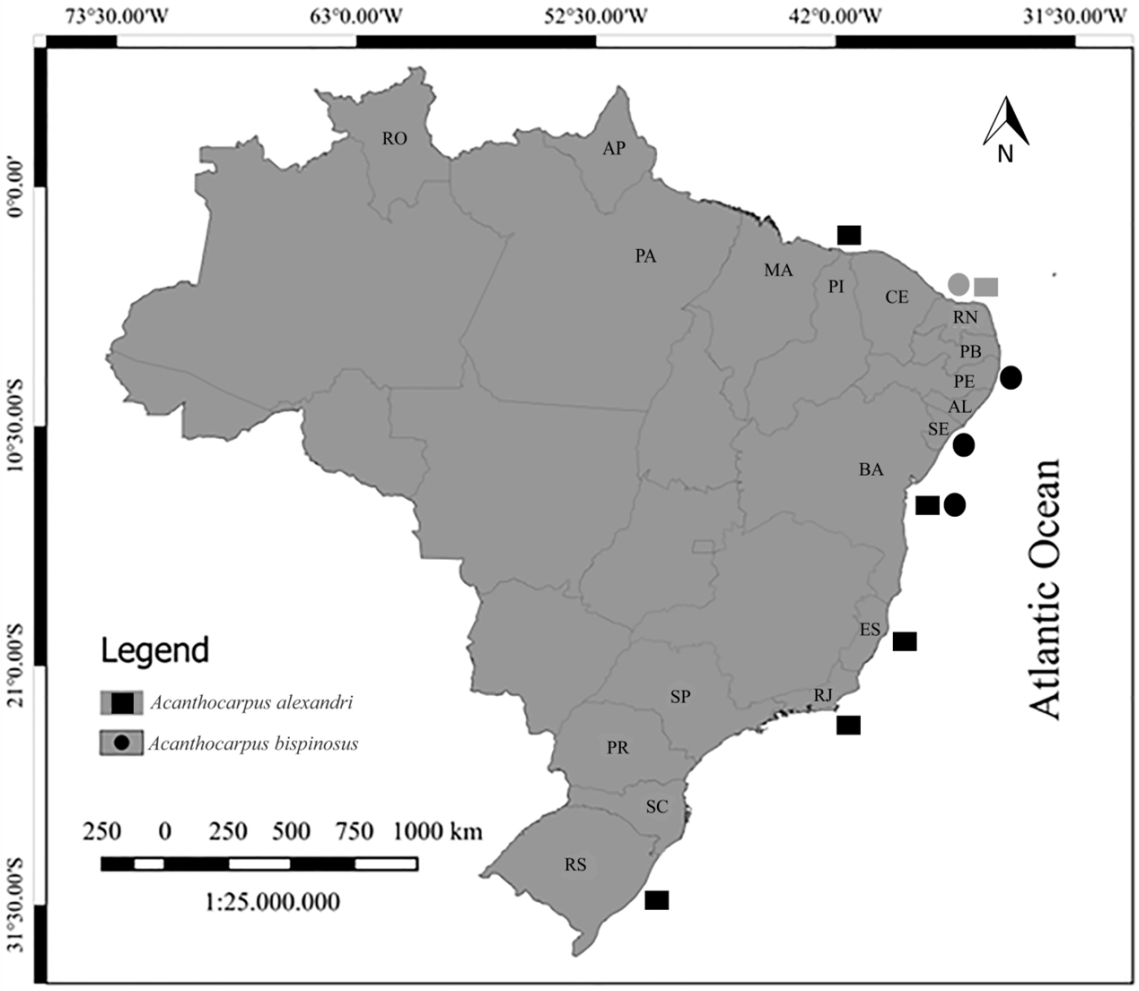

Figure 3. Geographic distribution of *Acanthocarpus alexandri* Stimpson, 1871 and *A. bispinosus* A. Milne-Edwards, 1880 in Brazilian waters. Black symbols: previous records. Gray symbols: new records.

Acknowledgements

The first author would like to thank CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) for the PhD scholarship in Oceanography. The authors are also grateful to Petróleo Brasileiro S.A. (Petrobras) for making available the material in this study. I would, specially, like to thank Dr. Silvio Lima for his support and the anonymous reviewers for their precious comments on this paper.

References

Abreu C.R,JR., Cruz R.A.M. & Young P.S. (2002) Primeira ocorrência de *Acanthocarpus bispinosus* A. Milne-Edwards, 1880 e novos registros de *A. alexandri* Stimpson, 1871 (Crustacea, Brachyura) na costa Brasileira (p. 94). *In*: Camargo T. & Carvalho C.J.B. (Orgs) Livro de Resumos do Congresso Brasileiro de Zoologia, 24. Itajaí: Sociedade Brasileira de Zoologia. 427 p.

Coelho P.A., Almeida A.O. & Bezerra L.E.A. (2008) Checklist of the marine and estuarine Brachyura (Crustacea: Decapoda) of northern and northeastern Brazil. *Zootaxa*, 1956: 1–58.

De Haan W. (1833–1850) Crustacea (p. 1–55). *In*: Siebold P.F. von (Ed.) Fauna Japonica sive Descriptio Animalium, Quae in Itinere per Japoniam, Jussu et Auspiciis Superiorum, qui Summum in India Batava Imperium Tenent, Suscepto, Annis 1823–1830 Collegit, Noitis, Observationibus et Adumbrationibus Illustravit, i–xxxi, ix–xvi, Leiden: Lugduni-Batavorum. 243 p.

Garth J.S. (1973) New taxa of brachyuran crabs from deep water off western Peru and Costa Rica. *Bulletin of the Southern California Academy of Sciences*, 72(1): 1–12.

Haefner P.A. (1981) Morphometry, reproductive biology, and diet of *Acanthocarpus Alexandri* Stimpson, 1871 (Decapoda, Brachyura) in the Middle Atlantic Bight. *Journal of Crustacean Biology*, 1(3): 348–357. doi: 10.1163/1937240X81X00438

Mané-Garzon F. (1980) Un nuevo Decapoda Brachyura Oxystomata de la costa oceánica del Uruguay: *Acanthocarpus meridionalis* n. sp. *Revista de Biología del Uruguay*, 7: 29–38.

Melo G.A.S. (1996) Manual de Identificação dos Brachyura (Caranguejos e Siris) do litoral brasileiro. São Paulo: Editora Plêiade. 603 p.

Melo G.A.S. (2010) The Brachyura (Crustacea: Decapoda) collected by the Gedip project between Torres, Rio Grande do Sul (Brazil) and Maldonado (Uruguay). *Revista Atlântica*, 32(1): 39–57.

Melo G.A.S., Torres M.F.A. & Campos O. (1998) Malacostraca-Eucarida. Brachyura. Dromiacea and Oxystomata (p. 439–454). *In*: Young P.S. (Ed.) Catalogue of Crustacea of Brazil. Série Livros 6. Rio de Janeiro: Museu Nacional. 717 p.

Milne-Edwards A. (1880) Reports on the results of dredging, under the supervision of Alexander Agassiz, in the Gulf of Mexico and in the Caribbean Sea, 1877, 1878, 1879, by the United States Coast Survey Steamer "Blake" VIII. Études préliminaires sur les Crustacés. *Bulletin of the Museum of Comparative Zoology*, 8(1): 1–68.

Monod T. (1946) Sur la presence du genre *Acanthocarpus* dans l'Atlantique oriental. *Publicações do Instituto de Zoologia*, 32: 7–10.

Mullowney D.R.J., Dawe E.G., Coffey W.A. & Squires H.J. (2011) Northern range extension of the gladiatior box crab, *Acanthocarpus alexandri* Stimpson, 1871 (Decapoda: Brachyura: Calappidae) in the Northwest Atlantic. *Journal of Crustacean Biology*, 31(2): 370–372. doi: 10.1651/10-3414.1

Ng P.K.L., Guinot D. & Davie P.J.F. (2008) Systema Brachyurorum: Part I. An annotated checklist of extant brachyuran crabs of the world. *Raffles Bulletin of Zoology*, Suppl. 17: 1–296.

Powers L.W. (1977) A catalogue and bibliography to the crabs (Brachyura) of the Gulf of Mexico. *Contributions in Marine Science*, 20: 1–190.

Ramos-Porto M., Torres M.F.A., Viana G.F.S., Santos M.C.F., Acioli F.D. & Cabral E. (2002) Registers of two species of Crustacea Decapoda Brachyura in Brazilian waters. *Nauplius*, 8(1): 169–171.

Rathbun M.J. (1937) The Oxystomatous and allied crabs of America. *Bulletin of the United States National Museum*, 166: 1–278.

Rodrigues C. & Young P.S. (2003) Duas espécies do gênero *Acanthocarpus* Stimpson, 1871 (Crustacea, Calappidae) para a costa do Brasil. *Boletim do Museu Nacional*, 505: 1–8.

Serejo C.S., Young R.S., Cardoso I.A., Tavares C., Rodrigues C. & Almeida T.C. (2007) Abundância, diversidade e zonação dos crustáceos no talude da costa central do Brasil (11˚ - 22˚ S) coletados pelo Programa REVIZEE/Score Central: prospecção pesqueira (p. 133–162). *In*: Costa R.A.S., Olavo. G. & Martins A.S. (Eds) Biodiversidade da fauna marinha profunda na costa central brasileira. Série Livros 24. Rio de Janeiro: Museu Nacional. 180 p.

Stimpson W. (1871) Preliminary report on the crustacea dredged in the Gulf Stream in the Straits of Florida by L.F. de Pourtales, Assist. U. S. Coast Survey. Part I. Brachyura. *Bulletin of the Museum of Comparative Zoölogy at Harvard College*, 2: 109–160.

Weber F. (1795) Nomenclator entomologicus secundum entomologiam systematicum ill. Fabricii, adjectis speciebus recens detectis et varietatibus. Chilonii et Hamburg: C.E. Bohn. viii. 171 p.

Williams A.B. (1984) Shrimps, lobsters and crabs of the Atlantic coast of the eastern United States, Maine to Florida. Washington: Adam Smith Institute. 550 p.