

## An update on the lobster species (*Panulirus* White, 1847) from the Abrolhos Marine National Park, Northern Brazil

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### ABSTRACT

The aim of this study is to update the list of spiny lobsters in the Abrolhos Archipelago. The data were obtained by scuba diving during diurnal (8am to 5pm) and nocturnal (7pm to 11pm) visual censuses, from 2 to 12 meters depth. This work presents the first record of *Panulirus laevicauda* on the Abrolhos Archipelago, confirm the previous unique record of *Panulirus echinatus* and reinforce the occurrence of *Panulirus argus*. All the spiny lobster species of the genus *Panulirus* registered in the Brazilian coast are now registered for the Abrolhos National Marine Park reinforcing the importance of this marine protected area.

Key words: Abrolhos, Brazil, lobster, Palinuridae, *Panulirus*, scuba.

### RESUMO

Este trabalho pretende atualizar a lista de espécies de lagostas de espinho para o Arquipélago de Abrolhos. Os dados foram obtidos através de mergulhos autônomos (SCUBA) durante censos visuais diurnos (8am a 5pm) e noturnos (7pm a 11 pm), em profundidades de 2 a 12 metros. Neste estudo apresenta-se o primeiro registro de *Panulirus laevicauda* no Arquipélago de Abrolhos, confirma-se a presença de *Panulirus echinatus* e reforça-se a ocorrência de *Panulirus argus*. Todas as espécies de lagostas do gênero *Panulirus* registradas na costa brasileira estão presentes no Parque Nacional Marinho dos Abrolhos, reforçando a importância dessa área marinha protegida.

Palavras-chave: Abrolhos, Brasil, lagosta, Palinuridae, *Panulirus*, mergulho (SCUBA).

### INTRODUCTION

The Abrolhos Bank is located in the eastern coast of Brazil (18°01'15"S 38°43'16"W). It includes the Abrolhos Archipelago which is a group of five volcanic islands about 70 kilometers offshore. Depths in the region rarely exceed 30m and rocky bottom around the islands is bordered by fringing reefs (Villaça and Pitombo, 1997; Dutra *et al.*, 2005, Francini-Filho *et al.*, 2008; Francini-Filho *et al.*, 2009).

Abrolhos region has the largest coral reefs in the south Atlantic, concentrating the highest coral reef biodiversity in the southern Atlantic, with a high degree of endemism (Villaça and Pitombo, 1997; Leão and Kikuchi, 2001; Dutra *et al.*, 2005). This result in a unique environment and a priority area for conservation, where the first Brazilian Marine National Park was established (Werner *et al.*, 2000).

Brazilian reefs as a whole, and particularly the Abrolhos Bank, are especially relevant to the conservation of biodiversity in the Atlantic Ocean, because they concentrate high levels of endemism in small areas of the ocean that are in immediate and serious threat (Dutra *et al.*, 2005).

Six major families of lobsters occur in the Brazilian coast: Palinuridae (*Justitia longimanus* (H. Milne Edwards, 1837), *Palinustus truncatus* A. Milne-Edwards, 1880, *Panulirus argus* (Latreille, 1804), *Panulirus echinatus* Smith, 1869 and *Panulirus laevicauda* (Latreille, 1817)), Synaxidae, Scyllaridae, Polychelidae, Enoplometopidae, Nephropidae (Dall'Occo *et al.*, 2007). Species of Palinuridae, Scyllaridae and Nephropidae are caught by the fishing fleet along the coast and almost all data come from the fish industry.

There are three *Panulirus* species in Brazil: *Panulirus argus* occurs from the north to the southeastern coast (01°27'S 48°30'W, 23°32'S 46°38'W) and in the oceanic islands of Fernando de Noronha Archipelago and Rocas Atoll; *Panulirus laevicauda* occurs from the north to southeastern coast (03°50'S 38°20'W, 23°17'S 44°10'W) and in Fernando de Noronha Archipelago, and *Panulirus echinatus* occurs mainly in the oceanic island of Saint Paul's Rocks, Rocas Atoll, Fernando de Noronha, Trindade, with sparse occurrences from the north to the southeastern coast (4°25'S 37°16'W to 23°02'S 48°21'W) (Melo, 1999).

Lobsters are one of the most important resources of the fishery sector due to their high economic value (Pinheiro *et al.*, 2003). Despite Abrolhos Marine National Park being a strictly protected area, where fishing is illegal, there are records of this practice (Ferreira and Maida, 2006). This can be a result of fishing activities that provide livelihood to the surroundings community, deficient governmental surveillance in this area and other factors.

The Abrolhos region has the most diverse crustacean fauna in Brazil with 535 recorded species

(Young and Serejo, 2005). The aim of this study was to provide a new record of spiny lobster (*P. laevicauda*) in Abrolhos and also register all the three species from the genus *Panulirus* found in Brazil to Abrolhos Marine National Park.

## MATERIALS AND METHODS

The data were obtained during underwater surveys in July 2009 (winter) and February 2010 (summer) in Santa Barbara Island (17°57'29"S 38°42'09"W), Redonda Island (17°57'38"S 38°42'55"W) and Siriba Island (17°57'59"S 38°42'52"W) in the Abrolhos Archipelago (Figure 1). Lobsters were registered during non-destructive (minimum interference in the ecosystem) diurnal (8am to 5pm) and nocturnal (7pm to 11pm) visual censuses (no capture of organisms), from 2 to 12 meters depth. The specimens were identified and photographed under-water. Only one specimen of *P. echinatus* was captured and further released. Taxonomic classification followed Melo (1999). The total sampled area during daytime was 0.063km<sup>2</sup> and 0.0269km<sup>2</sup> at night, and the bottom time was 19 and 14 hours, respectively.

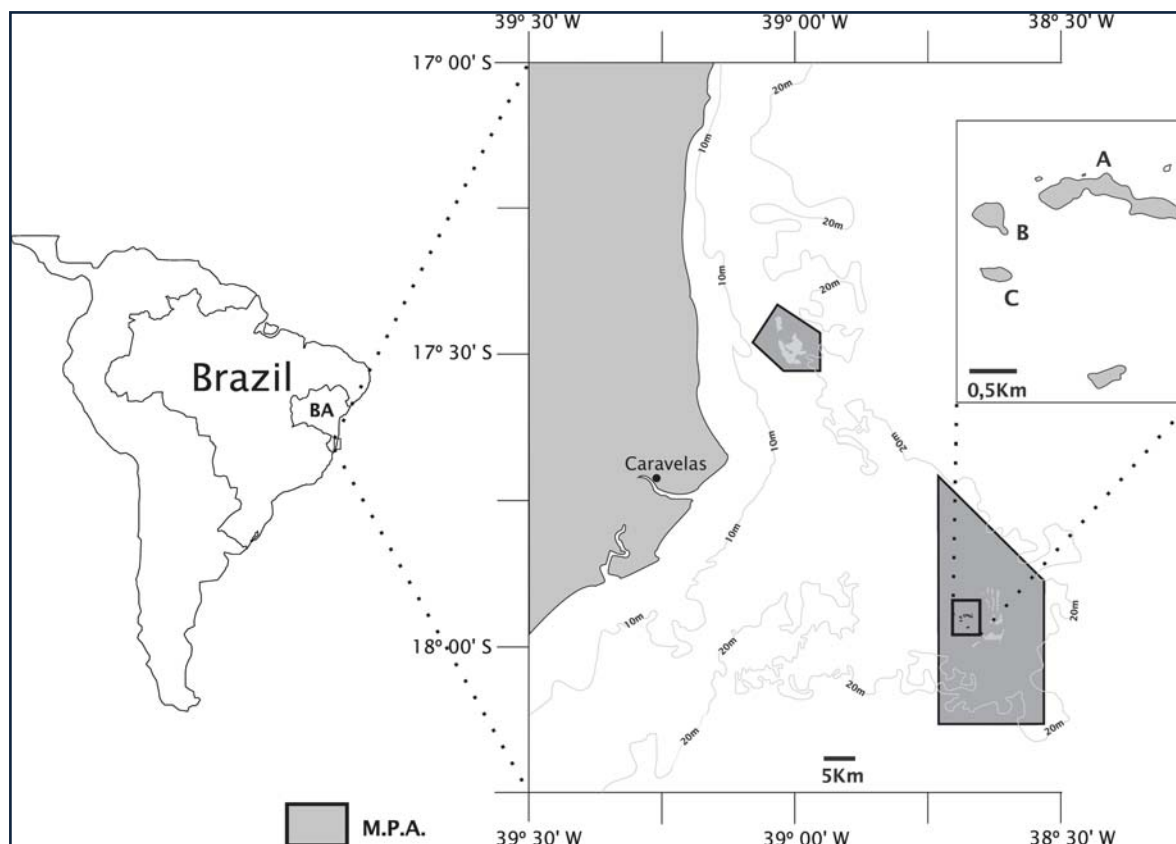


Figure 1. Map of the study area showing the location of Abrolhos Marine National Park (Marine Protected Area - M.P.A.). A) Santa Bárbara Island; B) Redonda Island and C) Siriba Island.

## RESULTS AND DISCUSSION

Three species of spiny lobster were recorded in the Abrolhos Archipelago: *Panulirus argus*, *Panulirus echinatus* and *Panulirus laevicauda*.

### Family PALINURIDAE Latreille, 1802

Genus *Panulirus* White, 1847

*Panulirus argus* (Latreille, 1804) (Figure 2)

A total of 73 specimens were recorded (14 during day time and 59 at night time) in the archipelago and were found in both months (July 2009 and February 2010): eight in Redonda Island, 18 in Siriba Island and 47 in Santa Barbara Island.

The biology of this species is well-known (Lewis, 1951; Acosta *et al.*, 1997; Yeung and Lee, 2002; Cox and Hunt, 2005; Briones-Fourzán *et al.*, 2006; Ehrhardt and Fitchett, 2010). Their occurrence on the Brazilian Coast is from Pará to São Paulo (01°27'S 48°30'W, 23°32'S 46°38'W) and two oceanic islands: Fernando de Noronha Archipelago (03°50'S 32°24'W) and Rocas Atoll (03°45'S 32°19'W) (Melo, 1999).

*Panulirus echinatus* Smith, 1869 (Figure 3)

This species had only five records, three in Siriba Island and two in Santa Barbara Island, only at night time, in February 2010.

This species was known to occur mainly in oceanic island (Góes and Lins-Oliveira, 2009). It was registered only once in Abrolhos (Young and Serejo, 2005). This present record confirms the occurrence of this species in Abrolhos Archipelago, reinforcing its occurrence in the continental shelf. The ecological aspects are well-known in two oceanic islands, Rocas Atoll (03°45'S 32°19'W) (Silva *et al.*, 2001) and São Pedro e São Paulo Archipelago (00°55'S 29°20'W) (Pinheiro *et al.*, 2003; Góes and Lins-Oliveira, 2009). However, Abrolhos has no ecological data for this species.

*Panulirus laevicauda* (Latreille, 1817) (Figure 4)

A total of 23 specimens were recorded (7 during day time and 16 at night time) in July 2009 and February 2010 in the archipelago: 6 in Redonda Island, 9 in Siriba Island and 8 in Santa Barbara Island.

This report represents a new occurrence for Abrolhos Archipelago. Previously the occurrence was in Fernando de Noronha Archipelago (03°50'S 32°24'W) and from Ceará to Rio de Janeiro (03°50'S 38°20'W, 23°17'S 44°10'W) (Melo, 1999; Santos *et al.*, 2010).

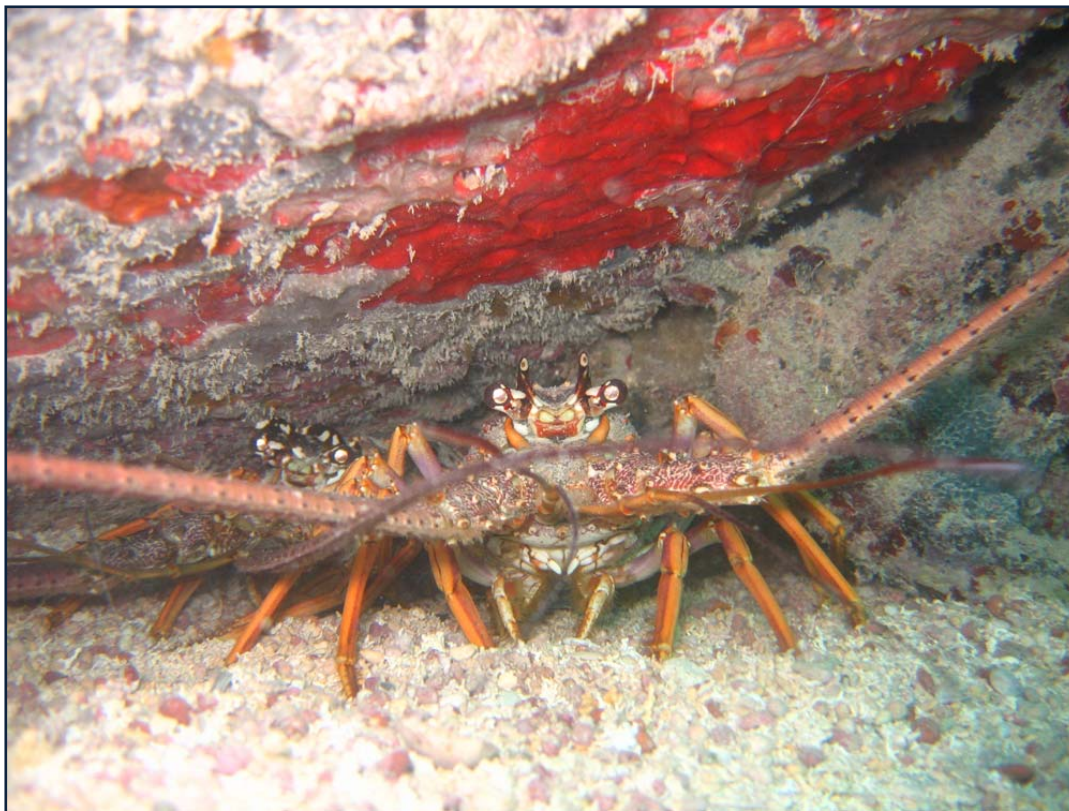


Figure 2. *Panulirus argus* (Latreille, 1804).



Figure 3. *Panulirus echinatus* Smith, 1869.



Figure 4. *Panulirus laevicauda* (Latreille, 1817).

## CONCLUSION

The genus *Panulirus* is one of the most economically important in Brazilian fishery (IBAMA, 2008). The Brazilian coast as a whole has suffered serious environmental damage due to the over-fishing problem. The presence of *P. argus* and *P. laevicauda* (puerulus fase, juveniles and adults including ovigerous female) in both seasons can show a maintenance of a local population in this marine protected area (MPA) but more studies are necessary to prove it. MPAs that exclude the practice of fishing have been shown an increase in the abundance and size of marine species (Cox and Hunt, 2005; Lester *et al.*, 2009; Goñi *et al.*, 2010; Hoskin *et al.*, 2011). In addition, not only it can also protect juveniles until they reach maturity and enter the fishery, but also protect and enhance existing spawning stock (Sladek Nowlis and Roberts, 1999; Pande *et al.*, 2008; Gaines *et al.*, 2010; Goñi *et al.*, 2010). The study provides information about spiny lobsters species in Abrolhos Archipelago. This demonstrates its high wealth and reinforces the biological importance of MPAs suggesting the necessity to maintain this rich ecosystem under protection.

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