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FIRST RECORD OF CHELONIBIA CARETTA (CIRRIPEDIA) ON Eretmochelys imbricata (TESTUDINES), IN BRAZILIAN LITTORAL

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ABSTRACT

During the nesting season of 2008 – 2009, nine specimens of the barnacle Chelonibia caretta were found attached to the carapace of a female hawksbill turtle Eretmochelys imbricata in Porto de Galinhas Beach, northeast of Brazil. The present contribution reports for the first time this association in the Brazilian littoral, being the fourth occurrence of the turtle barnacle in this country. This rare occurrence of C. caretta in Brazilian coast and its known connection with the turtle Caretta caretta as its main host, brings evidence on this record's importance as it provides data for inferences about the feeding habits and migration of the E. imbricata in the South Atlantic.

Keywords: turtle, barnacle; new occurrence; symbiosis; epibiosis.

RESUMO

Durante a temporada reprodutiva de 2008 - 2009, nove exemplares da craca *Chelonibia caretta* foram encontrados ligados à carapaça de uma tartaruga de pente fêmea, *Eretmochelys imbricata*, no litoral de Porto de Galinhas, Nordeste do Brasil. O presente trabalho é o primeiro registro desta associação no litoral brasileiro, sendo a quarta ocorrência da craca neste país. Esta rara ocorrência de *C. caretta* no litoral brasileiro e sua conhecida ligação com a tartaruga *Caretta caretta* como seu principal hospedeiro, é de extrema, uma vez que

fornece dados para inferências sobre os hábitos alimentares e migração de *E. imbricata* no Atlântico Sul.

Palavras-chave: craca, tartaruga, nova ocorrência; simbiose; epibiosis.

INTRODUCTION

Sea turtles are considered as platforms for the colonization of various species of the marine flora fauna. and being particularly commensal important to some species that are often overlooked (Monroe & Limpus, 1979; Frazier et al., 1985; 1991; 1992; Frick et al., 1998; Dobbs & Landry Jr., 2004). An analysis of sea turtle commensals, their biology and distribution should provide new insights on habitats in which they have lived (Dobbs & Landry Jr., 2004),

Among the epibionts commonly found in turtles, some species of barnacles maintain a strong relationship of dependency with this host (Pilsbry, 1916; Young, 1991), and several barnacles occur fortuitously on sea turtles, living in incidental association (Farrapeira, 2010). Besides the establishment of a harmonious relationship with the apparently, the barnacle host. clusters represent both a refuge and

a suitable substratum for several organisms (Morales-Vela et al.. 2008). This microenvironment has also adaptive and reproductive barnacles implications for the associated with sea turtles (Zardus & Hadfield, 2004). Furthermore, the barnacles can provide verv important clues regarding the ecological habits bound to movement and feeding of his hosts (Eckert & Eckert, 1988).

Unfortunately, much of the data on commensals and parasites associated with turtles are still considered incipient and inaccurate, because much papers related to this topic are based on extremely broad areas of samplings, small sample sizes, and dead turtles, affecting the credibility of information due to the possibility of the association between the two organisms have happened after the death of the turtle and that doesn't reflect the natural cycle of the studied association (Frick et al., 1998).

According to Farrapeira (2010) seven obligate commensal barnacles were found in association with sea turtles in the northeastern coast of Brazil: Chelonibia caretta (Spengler, 1790), C. testudinaria (Linnaeus, 1758), Platylepas decorata (Darwin, 1854), Ρ. hexastylos (Fabricius, 1798), Ρ. hexastylos ichthyophila (Pilsbry, 1916), Stomatolepas elegans (Costa, 1838) and S. transversa (Nilsson-Cantell, 1930). From the compiled data of this author. Chelonibia spp. apparently prefers the loggerhead turtle Caretta caretta as a nektonic host.

For Scharer (2001), due to its anatomical and behavioral characteristics the hawksbill sea turtle, Eretmochelys imbricata, is the hosts the species which most diverse epibiont fauna among the marine Testudines. It is worthy to highlight that although Scharer (2001) have registered around July and August, 1999 in the Caribbean ocean expressive affinity between Chelonibia genera and E. imbricata, this association was always uncommon to that area, and particularly in relation to Chelonibia *caretta*, any association had been previously registered.

The state of Pernambuco stands for presenting one of the oldest monitoring researches on sea turtles held in the Northeast, one at the National Park of Fernando de Noronha (03°50'30" S / 32°20'30" W) (Shaw, 1947; Guimarães et al., 2011), and the other in the south coast, Ipojuca county (08°24'06" S / 35°03'45" W), that since 2000 has their beaches (Camboa, Muro Alto, Cupe, Merepe, Porto de Galinhas, Maracaípe, Serrambi and Toquinho) monitored by a non-governmental organization called Ecoassociados (Guimarães et al., 2011). Over the last fourteen reproductive seasons it was registered in the Ipojuca beaches three species of sea turtles, Caretta caretta (Linnaeus, 1758), Lepidochelys olivacea 1829), (Eschscholtz, and Eretmochelys imbricata (Linnaeus, 1766) (Guimarães et al., 2011). However, records of association barnacles between and the hawksbill sea turtle E. imbricata are in the Brazilian rare coast (Farrapeira, 2010).

Torres-Pratts *et al.* (2009) believe that the life history of

Chelonibia caretta remains unknown in terms of dispersal potential. This contribution aims to report the occurrence of *C. caretta* on *Eretmochelys imbricata* in the South Atlantic.

METHODOLOGY

The record of the studied association occurred during the reproductive season of 2008-2009, on December 16th, 2008, in Porto de Galinhas Beach (08° 23' 56"S / 35° 03' 50"W), Ipojuca – Pernambuco

(Figure 1), as part of a long term sea turtle monitoring program of the nonorganization governmental Ecoassociados. After an adult female Eretmochelys imbricata in spawning had completed the oviposition and closed the nest it was intercepted by the team of daily monitoring. Barnacle ectosymbionts were removed using a stainless steel spatula. They were identified and deposited in the Cirripedia Laboratory of the Universidade Federal Rural de Pernambuco -UFRPE, preserved in alcohol 70%.



igure 01: Site of the record of the association between *Chelonibia caretta* and *Eretmochelys imbricata*, Porto de Galinhas Beach, Ipojuca-Pernambuco-Brazil.

Turtle straight carapace length (SCL, from notch to tip of distal marginal scute) and straight carapace width (SCW) were measured with metal forester's calipers to the nearest 0.1 cm Revista Nordestina de Zoologia, Recife v 8(2): p. 1-11. 2014.

2). Regarding (Figure to the biometry of the barnacles, it was recorded the following measures: height and the carino-rostral diameter. The location and abundance of individual barnacle 58 were recorded, as well the of barnacles. ontogenetic and reproductive stages



Figure 02: *Chelonibia caretta* recorded on December 16th, 2008, in Porto de Galinhas Beach, Ipojuca-Pernambuco-Brazil.

RESULTS

Among 33 Eretmochelys *imbricata* turtles that were in spawning, during the nesting period analyzed, only one was found with nine barnacles' specimens of the genus Chelonibia caretta. The host, of medium size, presented SCL of 94.2 cm and SCW 85.6 cm while barnacles' specimens presented an average carino-rostral diameter of 32.3 mm (20-46 mm) and height of 12.7 mm (4-26 mm).

All barnacles were located on the third posterior of the turtle carapace attached to the right side side (six) and left (three). Concerning the reproductive aspects, two adults presented incubated eggs in the mantle cavity and three had mature gonads; the rest were juveniles.

DISCUSSION

The finding of only one turtle, among the 33 that were nesting on the beach, containing barnacles as epibionts corroborates the observations of Farrapeira (2010), in regards to the rare occurrence of that association. Chelonibia caretta occurs worldwide as a commensal with sea turtles (ERC, 2007). however, in the Brazilian littoral, this commensalism has been described only with the loggerhead turtles Caretta caretta. In this host, the barnacle turtle was found in three states: Sergipe (Farrapeira, 2010), Rio de Janeiro (Pilsbry 1916), and Rio Grande do Sul (Bugoni et al. 2001).

Although Chelonibia caretta is found mainly as epibiont on loggerhead turtles Caretta caretta and green turtles Chelonia mydas (Linnaeus, 1758) (ERC 2007). associations with hawksbill turtles Eretmochelys imbricata are not fortuit. Cintrón-de-Jesús (2001),Frick et al. (2003), Schärer (2003), and Torres-Pratts et al. (2009) recorded this association in Caribbean Sea, and Hiro (1937), Monroe & Limpus (1979), and Dobbs & Landry Jr. (2004) found the same in the Indo-Pacific Ocean.

Besides, in the Schärer (2003) and Dobbs & Landry Jr. (2004) records, the barnacle species were the most frequent commensal found on the carapace plastron of Eretmochelys imbricata. This study acknowledges the first record on this turtle host for the South Atlantic and the lowest record of South latitude (Pernambuco State), expanding its occurrence to more than 600km to the North coast of Brazil. It is worth mentioning that the fact that there are few records of this association in the South Atlantic may be related to the lack of publication on the topic.

Chelonibia caretta adheres to the outer scute of the turtle carapace that is molted every year and actually increase the drag on the sea turtle and accelerate this process (Zardus & Hadfield, 2004). In this regard, it was important to find barnacles sexually mature. The attachment of specimens in various positions in the carapace of the turtle has also been observed by several authors (Hiro, 1937; Monroe & Limpus, 1979; Frick et al., 2003; Schärer, 2003; Dobbs & Landry Jr., 2004; Torres-Pratts et al., 2009), who also reported the same association prevailing in the

carapace, with no consistent barnacle attachment pattern.

Similarly to what Rawson et al. (2003) has demonstrated for the dispersion of the species C. testudinaria. which probably is affected by the association with its host. Caretta caretta that have cosmopolitan distributions highly and undergo extensive migrations, it occurs with Chelonibia caretta. Its occurrence provides data about the ecological aspects, connected to the routes of distribution (sites of spawning and feeding) of its hosts (Eckert & Eckert, 1988).

Eretmochelys imbricata is a circumtropical species, found in almost all Atlantic, Indian and Pacific Oceans (Groombridge, 1982; Witzell, 1983; Ernst & Barbour, 1989). In Brazil. it has been recorded in the northeastern coast of Brazil, especially in the states of Bahia, Sergipe, Pernambuco, and Piauí (De Santana et al. 2009; Marcovaldi et al. 2011). Particularly on the coast of Pernambuco State, this species of turtle has been reported frequently, and its occurrence has been increasing in the last six years (Moura et al. 2012;

Several authors (Groombridge 1982: Ernst & Barbour 1989; Guimarães et al. 2011) highlight the hypothesis that the cosmopolitanism of E. imbricata is justified by the association with nekton vertebrates of wide occurrence. They can swim long distances, cross several oceans and seas, and provides broad ranges of epibiont species as mobile hosts. In fact, according to Vaughan & Spring (1980), the hawksbill turtles range over a variety of habitats and may migrate long distances between foraging and nesting areas. Their preferred foraging habitats commonly include rocky areas, coral reefs, lagoons, bays and estuaries (Witzell, 1983).

Thus, mainly considering as true the low occurrence of this association in the northeast of Brazil associated with *Eretmochelys imbricata*, this record can provide data for inferences about sites of foraging or even concerning the migratory behavior of this turtle. An extended monitoring may produce data that helps answer some questions raised by this record.

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