Predation on the zoanthid *Palythoa caribaeorum* (Anthozoa, Cnidaria) by a hawksbill turtle (*Eretmochelys imbricata*) (Reptilia, Vertebrata) in southeastern Brazil

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Hawksbill turtles, *Eretmochelys imbricata* (Linnaeus 1766), occur throughout the world's tropical and subtropical oceans, ranging primarily from 30°N to 30°S (Meylan & Redlow 2006), being found mainly in the tropical regions of the Atlantic, Indian and Western Pacific oceans (Lutz & Musick 1997; Meylan & Redlow 2006). In the Western Atlantic Ocean they have been observed from the southern USA to southern Brazil, throughout the Central America, Bahamas and Caribbean Sea (Meylan & Redlow 2006). Young hawksbill turtles are unable to dive into deep waters, being forced to live in masses of floating sea algae, such as *Sargassum* (Lutz & Musick 1997; Pope 1939). After this early, long pelagic phase, benthic adult individuals typically inhabit coral reefs and other hard-bottom habitats (Carr et al. 1966, 1982). In addition, hawksbill turtles are most frequently observed in reefs where the sponge population is vast (Pritchard 1979). They are also found in mangrove bordered areas, shallow inlets, remote oceanic islands, offshore cays and mainland shores. Usually, they are found in water no deeper than 18m (Ernst 1982; Ernst et al. 1994; Pritchard 1979). They are listed as an endangered species in Brazilian waters under the Endangered Species List of 2003 (MMA 2003).

Although omnivorous, hawksbills seem to prefer invertebrates, feeding almost exclusively on sponges (León & Bjorndal 2002; Meylan 1988; van Dam & Diez 1996), but other prey items found inside their guts include cnidarians (the Portuguese man-of-war *Physalia physalis* and others siphonophores, thecate hydroids, corals, and the

zoanthid of the genus *Zoanthus*), ectoprocts (*Amtria*, *Steganoporella*), sea urchins, gastropods and bivalve mollusks (*Pinna*, *Ostrea*), barnacles, crustaceans, ascidians and fishes (Den Hartog 1980; Ernst 1982; Pemberton et al. 2000; Pritchard 1979) and some algae (*Cymodocea*, *Conferva* and *Sargassum*) (Carr 1952; Carl et al. 1994).

Den Hartog (1980) found some specimens of the sea anemones (*Anemonia sulcata*) and stalks of a thecate hydroid (Aglaophemiidae) in the stomach of hawksbills. The author used the cnidome (types and sizes of the nematocysts) and some remnants of the animals to identify their presence. However, the author also found other types of nematocysts, probably from an anthomedusae and from some chondrophoran (probably *Velella velella*) and scyphozoan nematocysts.

In this communication we present the record of a hawksbill feeding on *Palythoa caribaeorum* (Duchassaing & Michelotti 1860) colonies close to the Laje de Santos Marine Park (24°15'48"S 46°12'00"W), a rocky reef ca. 40 km off Santos (São Paulo State, Brazil) (Figure 1) on 4 March 2007 (Fig. 2, A-C). Underwater photographs were taken using a digital camera.

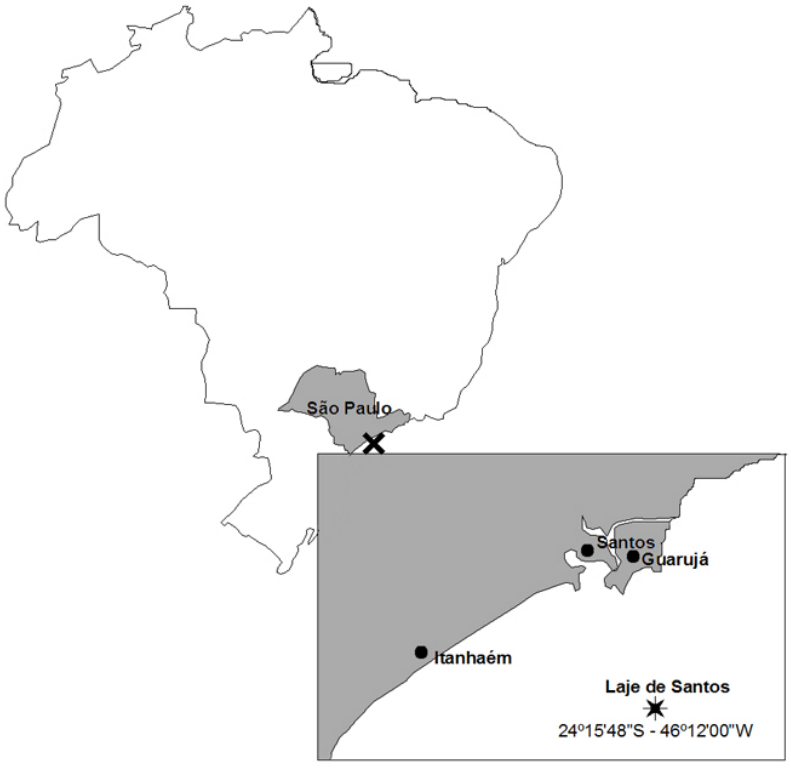

FIGURE 1 - Map showing the location of Laje de Santos, São Paulo state, Brazil.

The hawksbill turtle specimen was seen at a place where the zoanthid colonies are plentiful. It lay on lateral rock and start to bite, tear and pull out colony parts from the rock that were immediately eaten (Fig. 2, A-C).

FIGURE 2 - Predation on the zoanthid *Palythoa caribaeorum* by a hawksbill turtle (*Eretmochelys imbricata*). **A** – The turtle is arriving at the rocky outcrop; **B** and **C** – The turtle is eating zoanthid colonies.

Palythoa caribeorum is an anthozoan cnidarian that produces a massive quantity of mucous for its protection; this mucous contains a toxin called palytoxin (PTX) (Gleibs et al. 1995). The palytoxin (PTX) is a non-protein molecule and it is the most poisonous marine toxin known to date, resulting in alterations in skeletal muscles and affecting some physiological processes (Mereish et al. 1991; Tesseraux et al. 1983). Considering the feeding behavior of *E. imbricata*, PTX apparently does not affect this turtle species, probably due to an undescribed metabolic mechanism of toxin protection. A similar 'strategy' is known for the green turtle, *Chelonia mydas*, which can eat the most venomous animal of the world, the box-jellyfish *Chironex fleckeri* (Hamner et al. 1995).

Predation on zoanthids by hawksbill turtles is documented for *Zoanthus sociatus* from the U.S. Virgin Islands: it was recorded for some juvenile hawksbills and one adult at Buck Island (USVI), which has little or no sponges present (Pemberton et al. 2000). Similarly, the sponge community of the subtropical rocky reefs of Laje de Santos Marine Park is composed of small crypt and flat encrusting species very different from the complex structured sponge communities found in coral reefs (OJL Jr. pers. obs.). Hawksbill turtles show a strong selectivity for certain sponge species as food items (León & Bjorndal 2002), but apparently prey on zoanthid cnidarians when sponges are not fully available.

This type of predation may be a way of dispersion for the zoanthids, because during foraging by hawksbills a number of polyps may be released in the water column. Released polyps can settle on another rock and could regenerate and develop a new

colony. The fragmentation of zoanthid colonies as an asexual form of reproduction has been reported in the literature (Ryland 1997).

More monitoring of hawksbill foraging in this and other areas is warranted, particularly as this current note is based on a single individual. An interesting point suggested by van Dam & Diez (1997) is that hawksbill turtles may remain within a home range of limited area. Repeated sightings of tagged hawksbill turtles at fixed locations (Bjorndal et al. 1985; Boulon 1983), further support the observation that hawksbill turtles are relatively sedentary after reaching an adequate feeding area (Pritchard & Trebbau 1984).

This work also reinforces the importance of photographic records made by recreational scuba divers in ocean areas. The Laje de Santos Marine Park is a sanctuary in which sampling is restricted due to its distance from the coast. Accordingly, high quality photography is a useful tool for recording species and to obtain information *in situ*, thus preserving the communities of the protected area.

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