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private sector partners and government agencies to become more informed and develop capacity to influence government decision-making regarding urgently needed marine turtle conservation in Mozambique.

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Predation on the Zoanthid *Palythoa caribaeorum* (Anthozoa, Cnidaria) by a Hawksbill Turtle (*Eretmochelys imbricata*) 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 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, he also found other types of nematocysts, probably from an anthomedusae and some chondrophoran (probably *Velella velella*) and scyphozoan nematocysts.

Here 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 on 4 March 2007. Underwater photographs were taken using a digital camera.

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 (Figure 1).

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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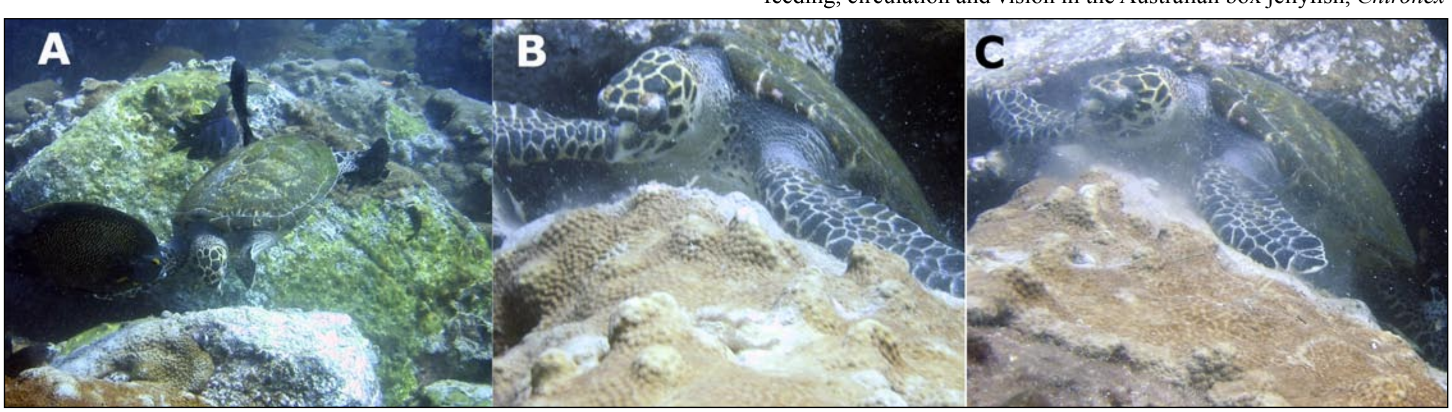

Figure 1. Predation on the zoanthid *Palythoa caribaeorum* by a hawksbill turtle (*Eretmochelys imbricata*). **A** – The turtle is arriving at the rocky outcrop; **B** and **C** – The turtle is eating zoanthid colonies.

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Rat Eradication as Part of a Hawksbill Turtle (*Eretmochelys imbricata*) Conservation Program in an Urban Area in Cabedelo, Paraíba State, Brazil

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The nesting of hawksbill turtles (*Eretmochelys imbricata*) in Paraíba State, northeastern Brazil, was first recorded in disturbed urban areas at Mar de Macaco in the municipality of Intermares (Mascarenhas et al. 2003, 2004). The Urban Turtles Project (UTP) was established during those studies and continues to monitor and manage the hawksbill nesting and green turtle (*Chelonia mydas*) foraging areas located there. The central area of the UTP effort is a highly developed, recently occupied (about 15 years) coastal community with resultant environmental impacts. A river mouth to the south of the project area drains a mangrove swamp, thus many species of birds, lizards, snakes and invertebrates are found in the narrow vegetation belt (60 m on average) landward of the nesting beach.

During the 2003/2004 and 2004/2005 nesting seasons, an invasion of brown rats (*Rattus novergicus*) became a threat to nesting success, with an estimated loss of close to 3000 eggs and hatchlings (Figure 1). The brown rat, an aggressive species, is able to locate nests and kill hatchlings inside the egg chamber before emergence. To tackle the problem it was decided to eradicate the rodents along a 2.3km section of the nesting area that is limited north and south (7°02'11" S 23°50'09" W and 7°03'18" S 34°50'35" W) by two small intermittent streams. The objective was to eliminate brown rat depredation of eggs and hatchlings.

The eradication program was conducted in four steps: 1- survey of non-target fauna, 2- setup of the management area, 3- anticoagulant poisoning campaign, and 4- continued monitoring to prevent recolonization. The non-target species were determined by direct observation, bibliographic research and consulting the reference collection of the Mammalian Cytogenetic Laboratory of the Paraíba Federal University. The results indicated that the mastofauna is impoverished as a result of urbanization. Local populations of two alien species of rodents (*R. novergicus* and *Mus musculus*) and one native species of marsupial (*Didelphis aurita*) were expected to be present, the latter population also expected to be in a state of disequibrium. However, there appeared to be a high diversity of predatory and scavenger birds, all of which could be affected through secondary poisoning (by feeding on dying or dead poisoned rats). Two species of owls were observed, the white owl (*Tyto alba*) and burrowing owl (*Athene cunicularia*), five species of hawks (*Polyborus plancus*, *Rupornis magnirostris*, *Milvago chimachima*, *Elanus leucurus*, and *Falco sparverius*) and three species of vultures (*Cathartes aura*, *C. burrovianus*, and *Coragyps atratus*). The herpetofauna and invertebrates were not considered to be threatened as the poison affects mammals, birds and fishes only. The fish were not surveyed because poisoning was conducted in the upper part of the beach and the bait was protected against rain and removal from bait stations, to avoid the risk of water contamination.

For poison, we used the anticoagulant brodifacoum, which is lethal to rats even in small concentrations. Brodifacoum acts by disrupting Vitamin K production needed for blood clotting. It has been successfully used in a similar project in Sangalaki, Indonesia, and evaluated by the Canadian Health Agency (Meier & Varnham