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The Recent Nesting Record of Female Green Turtle (*Chelonia mydas*), at Pamban, Gulf of Mannar

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Abstract

A female green turtle was sighted at Pamban along the Gulf of Mannar just after the nesting on the beach on 15th January 2011. Morphometric measurements of the turtle were taken and data suggests that this individual is adult. A total number of laid eggs were 109. The distance between the nesting site and the high tide line was found to be 7 m. The depth and diameter of the nesting pit was 52 and 16 cm, whereas the mean egg diameter and weight were found to be 44.3 mm and 40.5 g respectively. Pamban coast may also be considered an important place for nesting, because of the continuous mixing of waters of GOM and Palk Bay areas, which in turn create current patterns continuously throughout the year in addition to the monsoon season. Conservation of nesting habitat along Gulf of Mannar will be important to maintain the green turtle population.

Keywords: endangered species, laid eggs, morphometrics, nesting habitat

Introduction

Five species of the sea turtles, *Lepidochelys olivacea* (Olive ridley turtle), *Chelonia mydas* (Green turtle), *Eretmochelys imbricata* (Hawksbill turtle), *Caretta caretta* (Loggerhead turtle) and *Dermochelys coriacea* (Leatherback turtle) are found along the coasts of India including Lakshadweep, Andaman and Nicobar Islands. They all are also found in the Gulf of Mannar (Kar and Bhaskar, 1982). They are categorized as endangered species in Schedule I of the Indian Wildlife (Protection) Act, 1972 and are thereby protected.

In India directed fishery of olive ridley existed in Orissa and West Bengal during the 'arribada' and fishery of green turtle in Gulf of Mannar (GOM) and Palk Bay in Tamil Nadu. However, fishing and trading of turtles were totally stopped in the early 1980 in Tamil Nadu and in 1983 in Orissa and turtles were declared as endangered species (Rajagopalan *et al.*, 1996). Since then, turtles were landed as incidental catch of different gear predominantly in gillnets, hooks and lines and trawlers along the Indian coasts in different fishing operations. The sea grass and coral reef ecosystem in the GOM region, including islands, form a good habitat and a major nesting ground for several sea turtle species (CMFRI, 1977). Green turtle, locally known as 'Paer aamai' in Tamil, is predominantly herbivorous and feeds on sea grass. The name green turtle indicates the green colour of the fat.

In the Indian territorial waters there are not many information on the green turtle, except for a few nesting records (Bhaskar, 1984; Sunderraj *et al.*, 2002; Tripathy and Choudhury, 2002; Venkatesan *et al.*, 2004). The present account deals with a sighting of nesting of female green turtle on the Pamban fish landing centre at Rameswaram Island along GOM.

Materials and methods

The presence of one female green turtle (Fig. 1) along with its nest were reported on the sandy beach of Pamban landing centre along the GOM on 15-01-2011 (from 05.10-06.20 hrs) (Fig. 2). Shore and near shore water of the GOM were calm. Local enquiries revealed that it laid eggs at 04.30 hrs. The nest was filled with eggs. The position of the nesting pit was noted. All the eggs were removed and counted by excavating the nesting pit with the help of Forest Department staff who were already present on the spot (Fig. 3). The nest was excavated and the depth of the nest from surface to the bottom was measured (Fig. 4). To protect from natural predators, the eggs were safely transferred and buried in pits for incubation in a beach hatchery by the Department of Forests, TamilNadu. To determine the egg size, twelve eggs randomly collected at the time of translocation were



Fig. 1. Closure view of the green turtle at Pamban

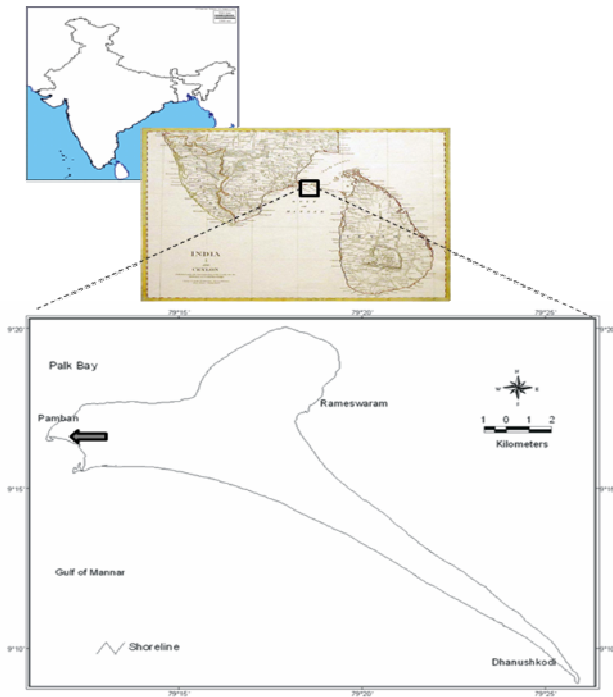


Fig. 2. Map showing the location (arrow mark) of nesting pit at Pamban coast



Fig. 3. Eggs of the green turtle kept on the plastic mat



Fig. 4. Nesting pit of the green turtle observed at Pamban

measured using a vernier caliper and each egg was then weighed with an electronic balance to the nearest 0.1 g. Morphometric measurements were also taken using a flexible tape. The distance from the shore during high tide to the nesting pit was also measured.

Results and discussion

Studies on the sighting of green turtle and its nesting from other parts of India were reported by several workers (Bhaskar, 1984; Sunderraj *et al.*, 2002; Tripathy and Choudhury, 2002; Venkatesan *et al.*, 2004). However, no recent information concerning the nesting of this species is available from Pamban coast. The day of observation i.e. 15th January 2011 comes under the nesting season of green turtle in GOM as reported by other researchers (Rajagopal *et al.*, 1996). The details of morphometric measurements of the female turtle are given in Tab.1.

The straight carapace length (SCL) of 90 cm is well within the range of adult size classes (86.5-109 cm SCL) obtained for this species from Western Samoa (Wetzell, 1982). From the morphometric measurements, it appears

Tab.1. Morphometric measurements of *Chelonia mydas* at Pamban

Particulars	Measurements (cm)
Carapace length	90
Carapace width	60
Plastron length	66
Plastron width	57
Anterior flipper length	46
Anterior flipper width	14
Posterior flipper length	39
Posterior flipper width	16
Weight (Kg)	40

that this individual is adult. The distance between the nesting site and the seawater line was found to be 7 m during high tide, which is lower than that reported for green turtle by Venkatesan *et al.* (2004). They found the nest between 12 m and 130 m from the high tide line while studying the nesting ecology of the green turtle along the Saurashtra coast.

The depth and diameter of the nesting pit was 52 and 16 cm respectively. The total number of observed eggs in the pit was 109. Hirth (1980) reported that the clutch size of green turtle of various beaches ranged between 81-147 eggs. In the present study the observed total egg number is found within that reported range. The egg of the green turtle is spherical in shape and milky white in colour (Fig. 4). The shell is flexible and leathery. The mean egg diameter and weight were found to be 44.3 mm and 40.5 g respectively. Limpus *et al.* (1984), Ackerman (1981) and Booth and Astill (2001) studying on this aspects discovered the same data, that can be affirmed that there is no variation in the egg size of the green turtle populations in different parts of the world.

Bhaskar (1984) gave an account of the distribution and status of sea turtle in India. Status of the breeding population of this species along the Gujarat coast was also studied recently by Sunderraj *et al.* (2002). Tripathy and Choudhury (2002) gave an account of recent sightings of the green turtle on the coast of Andhra Pradesh. Pamban coast may be one of the nesting sites for green turtle. Thick coastal population of Pamban, especially by fisherfolk, might have degraded this

nesting beach and moreover this coast is now becoming fish landing centre. Therefore, there might have chance of more and more incidental catch and intentional hunting for meat. Rajagopalan *et al.* (1996), studying the incidental catch of sea turtles in India, reported the same fact i.e. green turtle formed 75% of incidental catch.

Turtle meat, oils and shells were exported to different countries in the past. In the 1960, around 3000-4000 turtles were landed every year in GOM (Rajagopalan, 1996). Gill net and bottom trawl has been considered as the most impacting fishing gears for sea turtle populations in terms of number of catch per year. During 1985-1995, gill net formed 76.5%, followed by trawl net (17.8%) in total incidental catch.

Marine turtles are migratory during all stages of development (Carr, 1987) and different current pattern play a crucial role in their behaviour. Days to week after hatching, the turtle locate oceanic currents that transport them to distant nursery areas (Bolten, 2003a). The current systems of major importance in GOM and Palk Bay are those caused by the south-west and north-east monsoons. During south-west monsoon, the direction of the current is clockwise and the reverse in northeast monsoon. These currents may play an important role in drifting the sea turtle and its hatchling towards offshore. Pamban coast may also be considered an important place for nesting because it is located adjacent to the Pamban-Pass, where the continuous mixing of waters of the two areas of GOM and Palk Bay take place, which in turn create current patterns continuously throughout the year in addition to the monsoon season.

Conclusions

Artificial nesting grounds can be constructed in and around Pamban as an aid to conserving this important species. Conservation of nesting habitat along Gulf of Mannar will be important to maintain the green turtle population, even more that the recent identification of the nest in Pamban proves the importance of this place related to the green turtle reproduction. This study will help to earmark the places to be conserved for nesting.

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