

A STUDY OF ECOLOGY, BREEDING PATTERNS, DEVELOPMENT AND KARYOTYPE PATTERNS OF THE OLIVE RIDLEY, *LEPIDOCHELYS OLIVACEA*

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Sea turtle populations have decreased all over the world due to human consumption of eggs in large numbers, predation on eggs and hatchlings by non-human predators, poaching of the adults for meat and other products as well as by disruption and alteration of nesting beaches. From conservation point of view, the sea turtles have aroused attention among scientists in recent years. On account of their vulnerability all the 5 species, namely *Dermochelys coriacea*, *Eretmochelys imbricata*, *Chelonia mydas*, *Lepidochelys olivacea* and *Caretta caretta* were given protection in September 1977 by an amendment to the schedules of Indian Wild Life Act (1972).

Until recently, Olive Ridley (*L. olivacea*) was found in abundance but now its population is on decline. The present project was with a view to study the ecology, breeding, development and karyotype patterns of this species. In addition, the project envisaged laboratory studies to hatch the eggs under controlled conditions, manipulate the sex differentiation, and raise the hatchlings to develop husbandary methods for "turtle farming".

The field studies were undertaken in Gahirmatha on the eastern coast which is the largest rookery for Olive Ridley in India extending over 11 kms. It was observed that mating occurs on the surface in the shallow waters adjacent to the nesting beaches 55-60 days before mass nesting. The Olive Ridley prefers a dry season for laying eggs. At Gahirmatha, the 'Arribada' (mass nesting) occurs twice, once during January-February, followed by 2nd Arribada during March. A profile of mass nesting indicates that the size of population nesting from year to year ranges from 47,000-6,00,000.

The turtle prefers isolated and quiet beaches. They prefer fine hard sand with sufficient moisture and avoid vegetation areas. They prefer higher elevation as compared to flat surface.

The Olive Ridleys mass-land on the beach generally 2 hours after or before the high tide. Nesting takes place at night which takes only 1.30—2 hours. On landing, they search for a suitable site and often several compete for the same site. The turtle makes a shallow pit of 10-15 cms before digging the nest. It lays the eggs into the pit and later fills the nest cavity with sand. Each turtle lays 36-182 eggs in one single cluster. After laying the eggs, the pit is filled with sand to cover the eggs and well levelled. The turtle then returns to the sea. The occurrence of mass nesting is highly correlated with the lunar cycle and usually takes place 2-3 days before or after the full moon.

The incubation period is 45-51 days at $33 \pm 0.5^\circ\text{C}$ and may extend to 72-74 days at $28 \pm 0.5^\circ\text{C}$. Laboratory studies indicated that the eggs do not hatch below 27°C and thermal tolerance is 35°C for successful hatching. The hatchlings emerge to the surface *en masse* by periodic outbursts. The emergence starts around 7 P.M. and continues till next morning. About 65% hatchlings return to the sea after emergence and rest attempt to do so in the cool of the morning. The mortality factors include scorching heat which kills the hatchlings who do not find the right direction to the sea, predations by dogs, jackals, birds, kites, crabs, sharks, dolphins and uncovering of the nests by tide.

Temperature of incubation affected the sex, apart from duration and rate of development. Only females were produced at 30°C and above; while the males were formed at 28°C and below. Both males and females were produced at 29.5°C . In Gahirmatha, most of the hatchlings resulting from first nesting were males and those from second nesting were females.

Chromosome analysis of the spleen cells of a sea turtle *Lepidochelys olivacea* indicated diploid number to be $2n=56$. Of the 56 chromosomes, 12 pairs are macrochromosomes and the remaining 16 pairs are microchromosomes. Sex chromosomes could not be determined due to lack of heteromorphism.

Period of Study : November '85—October '88