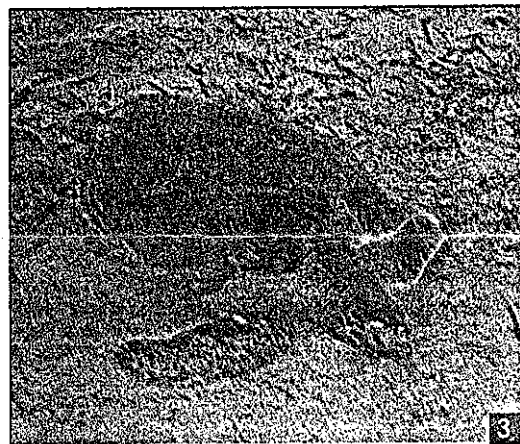
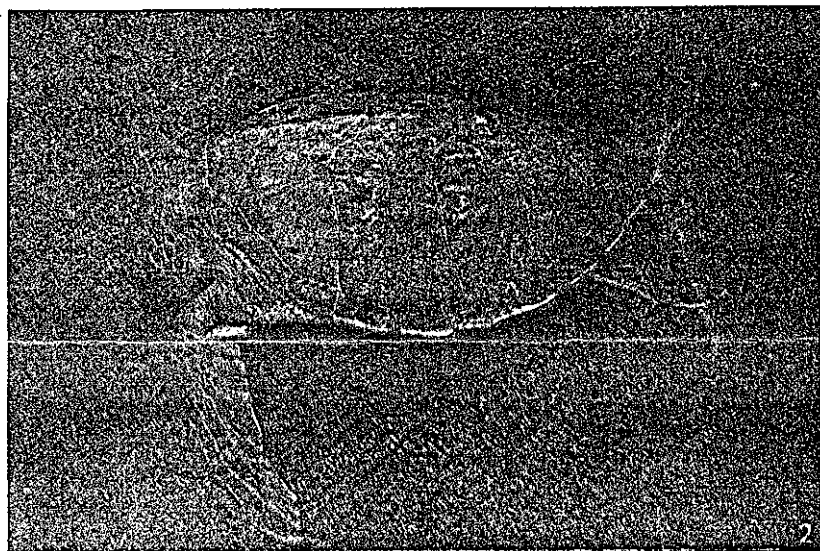


# Distress Call of an Ancient Mariner

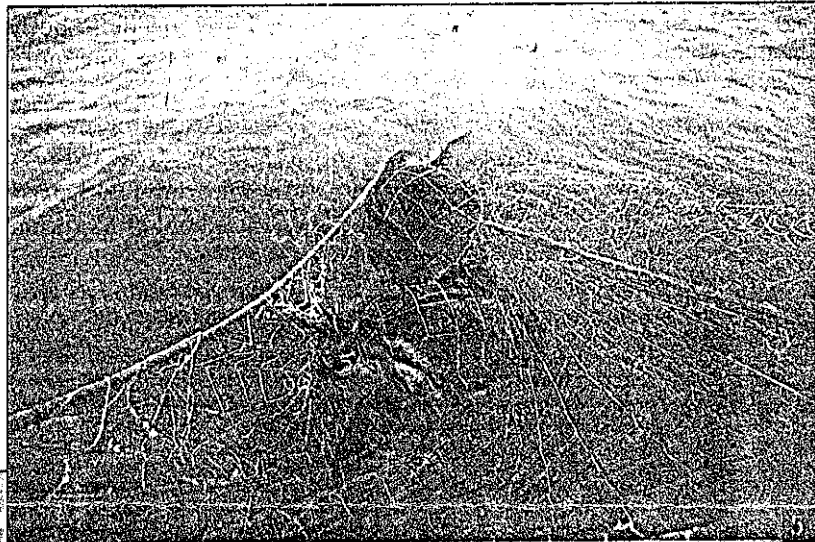
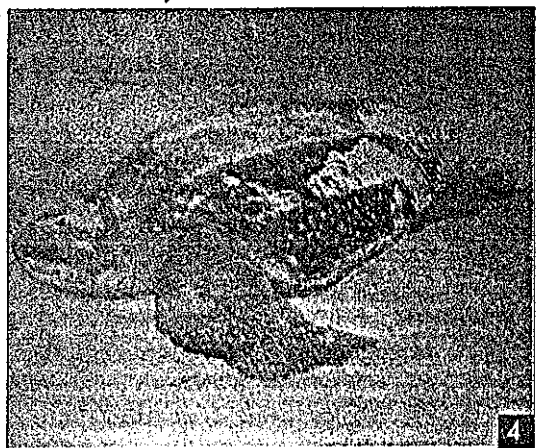


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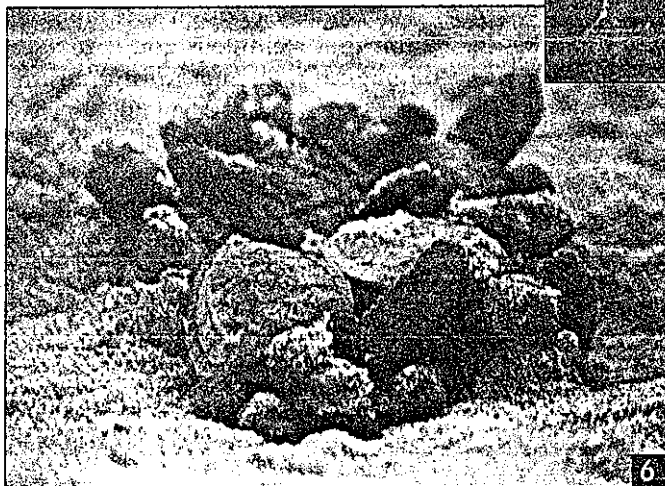
Kanik Shankar

B. C. Choudhury



Bivash Pandey

Bivash Pandey



- 1 Olive Ridley
- 2 Green Sea Turtle
- 3 Leather back
- 4 Hawksbill
- 5 Turtles entangled in gillnet
- 6 Hatchlings emerging from nest

*With best  
Compliment  
Dassu*

# The Sea Turtle Story

Five of the seven species of sea turtles found worldwide are reported to occur in Indian coastal waters and the Bay Islands. But a lot needs to be done for the conservation of these turtles, says **BASUDEV TRIPATHY**

IMAGINE the bioluminescence on the backs of graceful saltwater reptiles as the lumbering Olive Ridley turtles emerge from the dark sea, searching for a secure nesting site. Picture some digging up the sand with their rear flippers, others freezing in position, as they lay their eggs and still others disappearing into the blackness of the ocean after completing egg laying. Yet the next morning it all seems a dream. Not a single turtle remains on the beach. The thousands of criss-cross marks left behind by the nesting activity are all too soon wiped away by the waters.

The beaches of Orissa are mute witnesses to this frenetic annual event called *arribada* (Spanish word meaning 'mass arrival'). Of the few such mass nesting beaches left in the world today where *arribadas* occur, the 480-km Orissa coast harbours three, namely Gahirmatha, Devi river-mouth and the Rushikulya river-mouth

This turtle-madness is lifetime footage for any photographer, and precious privilege for a wildlife lover, biologist or conservationist. Thousands visit the Orissa coast every year to witness it. However, were you to miss the eventful night, there is no guarantee of a repetition next year.

## Sea Turtle Scan

All turtles, terrapins and tortoises belong to the Order Testudinata (also called Chelonia). Of the more than 220 species of living turtles, seven are marine. Sea turtles are ancient creatures having called Earth home for more than 200 million years. They appeared in the late Jurassic as the descendants of turtles that inhabited swamps and marshes during the late Triassic. *Archelon ischyros*, the largest turtle to ever live, was a sea turtle during the Cretaceous Period.

Sea turtles live in the tropical and subtropical ocean waters off North America, Central America, South America, South Africa, India, and Australia. They have been spotted off Atlantic Canada and are not uncommon in the warmer waters off Europe. The only seas these animals do not venture into are the cold waters of the Arctic and Antarctica.

## Sea Turtle Saga

Sea turtles like other turtles have a tough outer shell, which protects their soft insides. These shells are made up of two layers. The top shell of these creatures is called the carapace. The bottom shell is referred to as the plastron.

Sea turtles surface only to breathe but need to come ashore to nest and on rare occasions to bask. Adult sea turtles spend most of their time at the feeding grounds, migrating at one to several year intervals to areas just offshore from their nesting beaches, where they may stay from two to six months. During the breeding season, males and females migrate to their specific breeding grounds, which may be thousands of kilometers from their feeding grounds. Mating occurs in the offshore water of the breeding grounds.

Sea turtles usually nest more than once per season and they nest at night. The number and size of eggs vary depending on species. They bury their eggs in sand above the high-tide level on the beaches. Like all turtles,



Olive Ridley carcasses on a beach of Orissa coast

**“Conservation efforts would be effective if people and organizations both take initiatives in the process. Any conservation effort should include the people living around turtle-nesting beaches.”**

incubation is a non-attended affair. The incubation period for the eggs is around two months, with the ambient nest temperature during the middle “trimester” determining the sex of the hatchling. This phenomenon is termed temperature-dependent sex determination.

Hatchlings emerge *en-masse* about 50 days later and move towards the sea. They use a combination of cues including the faint glow of the horizon to orient themselves toward the waterline. Once in the water, they continue to orient oceanwards and enter into a “swimming frenzy”. The frenzy lasts for several days and helps them to safely negotiate the shoreline currents and escape predators. They then disappear into the sea and are not seen again until adulthood.

The next few years are called the “lost years” because very little is known about where the young turtles go, what they do, and how long they stay as juveniles. Maturity appears to be reached in about 15 years to 50 years and this too varies between different species. Mature Sea turtles are believed to return to their birthing ground to nest.

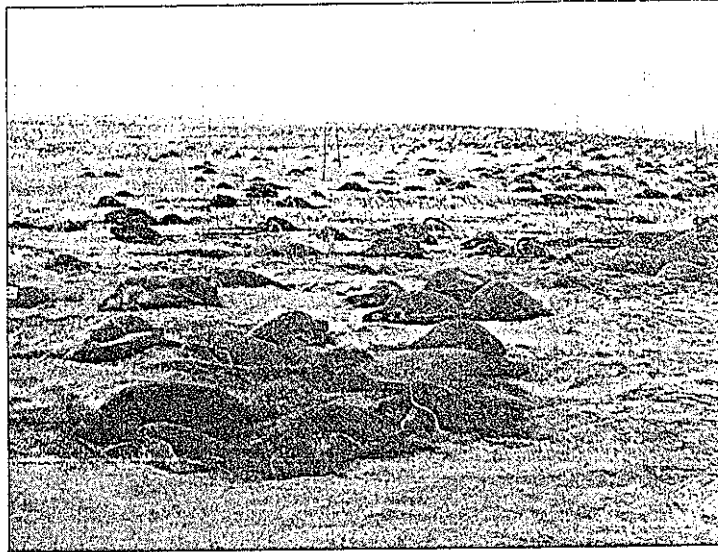
### Sea Turtles of India

Five species of Sea turtles – the Leatherback (*Dermochelys coriacea*), Hawksbill (*Eretmochelys imbricata*), Green turtle (*Chelonia mydas*), Loggerhead (*Caretta caretta*), and the Olive Ridley (*Lepidochelys olivacea*) – occur in Indian coastal waters. Except the loggerhead turtles, all the species are also known to nest in India.

**Leatherback turtle:** The species is named for its leathery/soft shell. This endangered turtle is the largest among the sea turtles found in the world and weighs about 500 kg. It can reach about 2.5 to 3 meters in length. Leatherback turtles are not reported so often off the mainland coast but the Nicobar beach harbours one of the largest populations of leatherbacks in the South Asian region.

**Hawksbill turtle (*Eretmochelys imbricata*):** Hawksbill turtle is named for its hawk-like beak. This endangered turtle is comparatively smaller and less abundant than the other species in Indian waters. The carapace of the adult turtles is dark brown, marbled with yellow blotches while the ventral part is yellow. The Lakshadweep Island supports a good population of hawksbill turtles thanks to the coral ecosystem where they are mostly found. While

Bivins-Pandey



Arribada

Andaman and Nicobar islands have a few good nesting beaches, this turtle occasionally also nests along the mainland coast of India. The Hawksbill turtle is of great economic value because of its horny shields, which yield the valuable “tortoise shell” of commerce, though these days plastic has largely replaced it.

**Green turtle (*Chelonia mydas*):** The name green turtle comes from the greenish colour of its fat. The green sea turtle is the largest hard-shelled sea turtle. Adults of this endangered species commonly reach 100 cm in length and 150 kg in mass. The shell changes colour from black to various shades of gray, green, brown and black, forming swirls and irregular patterns. It is predominantly herbivorous and feeds on sea grass and seaweeds. It nests mostly in the Gulf of Mannar, Palk Bay and Gulf of Kutch area of India. Nesting sites are also located in the Andaman and Nicobar islands and the Lakshadweep group of islands. Green turtles have been prized for thousands of years for their meat, and once were referred to as the “cattle of the oceans”.

**Loggerhead turtle (*Caretta caretta*):** Loggerhead turtles get their name from their exceptionally large heads. This endangered species looks similar to the green turtle except that it has a reddish-brown shell. In India, nesting of loggerhead turtles has not yet been confirmed though there are reports from Tamil Nadu and West Bengal.

**Olive Ridley turtle (*Lepidochelys olivacea*):** The Olive Ridley Sea turtle is an endangered species found in the coastal waters off Orissa. This turtle is well known for its *arribada*. The major mass nesting sites for Olive Ridley Sea turtles around the world are in Costa Rica, Pacific Mexico and the Orissa coast of India. Although the Olive Ridley Sea turtle nests in low densities along the entire coast of India, the most important nesting beaches lie in Orissa. A significant portion of the world’s Olive Ridley population (30 to 40 per cent) is believed to migrate every winter to nest at the three rookeries of Orissa.

## Sea Turtle Survival

Sea turtles are vulnerable at all stages of their life cycle, whether it be the egg, hatchling, sub-adult or adult stage of their lives. Beach mammals (wild and domestic), birds, crabs, insects etc., prey upon eggs and hatchlings. In water, the potential predators are tiger sharks, hammerhead sharks, white sharks, killer whales and saltwater crocodiles. Sea turtles are also fished for food and both nesting and non-nesting populations are under threat both at the feeding as well as breeding grounds. Turtle fishing is a practice in the Gulf of Mannar area, Lakshadweep and Andaman and Nicobar islands mainly for food, medicine, oil and for making curio items from shells. Poaching of eggs continues in many parts of coastal India.

There is also the ever-present threat of habitat reduction/destruction, pollution, and tourism. There is evidence that young Sea turtles can confuse oil droplets for food and that some adults eat plastic bags, mistaking them for jellyfish. But the most dangerous threat is mortality due to marine fishing related casualties. So severe is the predation that the average survival rate for sea turtles from the eggs to adulthood has been estimated at less than 0.1%.

Orissa is one of the major fishing grounds, thanks largely to its fertile estuarine habitats. Sea turtles spend more than six months in the coastal waters of Orissa for breeding and later nesting in suitable beaches. During the breeding season, the turtle population is concentrated in the near-shore coastal waters where fishing intensity is high. Turtles frequently get entangled in the nets and die due to drowning since they are unable to surface for air. It is speculated that the large-scale mortality and disturbances to sea turtles, has been the cause of failed *arribadas* at Gahirmatha for several seasons.

The major problem at Rushikulya mass nesting beach is the coastal illumination near the beach. The lighting from the industries close to the beach along with the mushrooming of aquaculture farms near the beach are threats to nesting turtles as well as the hatchlings. Beach lighting is harmful because it disorients the animals. Attracted by bright on-shore lights as compared to the dim glow of the horizon, hatchlings are unable to find their way to the sea and die of desiccation or predation.

The problem at Devi river mouth is the extensive plantation of *Casuarina* trees near the beach, which makes the beach unsuitable for nesting.

## Tracking Sea Turtles

Though sea turtles have been the focus of conservation attention and scientific research for decades, much about these ancient animals is still unknown. Satellite telemetry is now being used to track sea turtles to study their long-range migrations and foraging areas. The telemetry device attached to the animal relays its location back to the scientists. Information such as how deep the turtles dive,

how long they stay underwater, their swimming speed, their heart rates, and how long they are spending at a particular depth can also be collected using this technique. While sonic and radio telemetry require the scientist to be within a few kilometers of the animal to receive the signal, satellite telemetry devices can relay information from anywhere on the globe. This works much better for the far-ranging and elusive sea turtles.

A satellite telemetry experiment on four nesting Olive Ridley Sea turtles was recently conducted in India for the first time. Though the animals were presumed dead after four months when the transmitters failed to send signals, many facts came to light from this experiment. Scientists confirmed that some turtles do indeed migrate to the offshore waters of Sri Lanka, while others remain in Orissa. This in itself was a surprise as all the turtles were expected to swim southwards towards Sri Lanka immediately after the nesting season. While it is disappointing that much information could not be obtained for a longer period, at least the scientific world now knows that not all turtles leave the breeding ground immediately after nesting. This is important information in designing conservation strategies. Many more turtles will need to be studied using this kind of devices before their life at sea is completely understood.

## Sea Turtle Conservation

All Sea turtle species found in India are completely protected and placed under the Schedule I of the Indian Wildlife (Protection) Act, 1972. There is a complete ban on the killing and poaching of any species for any purpose. The Convention of International Trade on Endangered Flora and Fauna (CITES) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS) also prohibit trade in turtle products and place these animals in Appendix I and Appendices I and II of the conventions respectively.

A major step would be giving protected area status to the important nesting areas. A ban on near-shore fishing activities will also reduce the mortality of turtles in offshore waters. Besides, adoption of Turtle Excluder Devices (TED) by mechanized fishing vessels will help minimize deaths due to drowning. The WIO has already issued notification regarding non-acceptance of any marine fisheries products particularly the shrimps from countries that they do not use TED during fishing.

However, conservation efforts would be effective only if people and organizations both take initiatives in the process. Any conservation effort along the coast should include the people living around turtle-nesting beaches. The involvement of these communities and their welfare may be critical to the long-term conservation of marine turtles as well as coastal habitats.

Shri Basudev Tripathy is a Sea turtle biologist. Address: C/o Sea Turtle Research Project, Wildlife Institute of India, Post Box No. 18, Chandrabani, Dehradun-248 001, Uttaranchal.