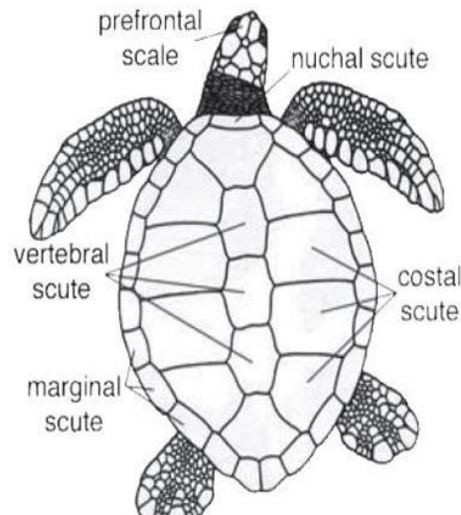


Sea turtle diversity

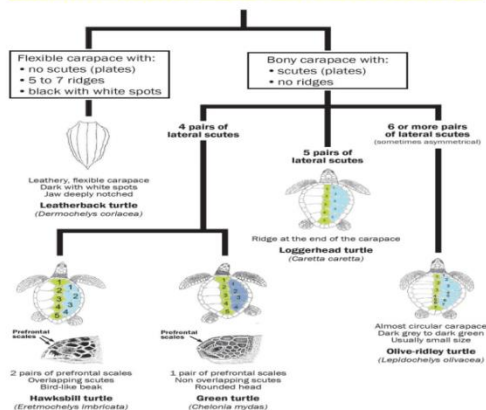
R. Ratheesh Kumar and R. Rahul

ICAR – Central Marine Fisheries Research Institute, Kochi

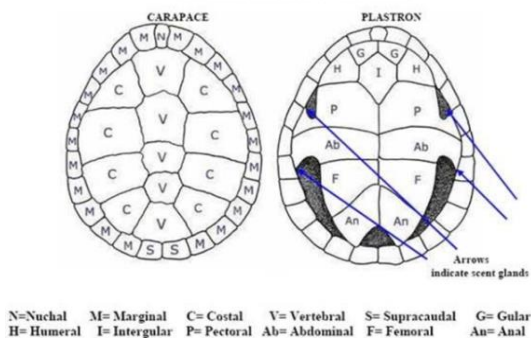
Scientists recognized seven living species of sea turtles globally, which are grouped into six genera under two families. India's coastline is home to five species of sea turtles; olive ridley turtle (*Lepidochelys olivacea*), green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*), and leatherback turtle (*Dermochelys coriacea*). Unfortunately, their population is declining worldwide due to over-exploitation, pollution, habitat degradation, vessel hits, incidental catch, etc. Tamil Nadu and Orissa coasts play vital roles as the major marine habitats for sea turtles in India. All five species of sea turtles were recorded from the Tamil Nadu region. Andhra Pradesh and Tamil Nadu coasts serve as migratory pathways for olive ridleys, while Orissa's Gahirmatha stands as the world's largest rookery. Schedule I of the Indian Wildlife (Protection) Act 1972 safeguards all five sea turtle species, but conservation efforts must intensify emphasizing stakeholder involvement and alternative livelihoods. Turtle Excluder Devices (TEDs) serve as a successful method for mitigating trawling-related mortality in sea turtles. The widespread adoption of TEDs in trawl fisheries, coupled with governmental oversight and enforcement of TED regulations, is crucial for successfully implementing these regulations (Boopendranath *et al.*, 2006). Identification of sea turtle species in Indian waters relies on criteria including carapace lengths, costal scutes, prefrontal scales, and vertebral scutes' shapes. Clear photographs of the carapace and head are recommended in case of accuracy in identification.



MARINE TURTLES IDENTIFICATION KEY



Nomenclature of a Turtles Scutes



Olive ridley (*Lepidochelys olivacea*)

The Olive ridley turtle has a global distribution throughout the tropical waters. These turtles nest on tropical coastlines across the globe, preferentially found along tropical mainland shores and barrier islands, frequently in proximity to river estuaries. Their nesting sites span across the mainland of India, including the Andaman and Nicobar Islands, and to a lesser extent, the Lakshadweep Islands. Adult Olive ridley weighs around 50 kg, featuring a short and wide carapace that is smooth but elevated, forming a distinctive tectiform or tent-shaped structure. The coloration of Olive ridleys is mid to dark olive green, identified by 6 to 9 pairs of

asymmetrical costal scutes, they have a large, triangular head, two claws on each flipper, and a creamy yellow plastron with a pore near the rear margin of infra marginals. Olive ridleys engage in night nesting behavior, laying 1 to 3 clutches per season, each containing 100 to 120 eggs, with an egg size of approximately 4 cm in diameter. The re-nesting interval ranges from 20 to 28 days, and the re-migration interval is typically 1 to 2 years. The nesting track, which is 70 to 80 cm wide and light in color, exhibits asymmetrical oblique marks created by the forelimbs, while the tail drag mark is either absent or not easily noticeable, adding to the unique characteristics of these remarkable turtles.

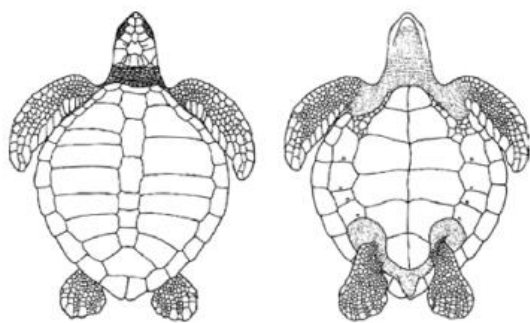


Fig.1. Olive ridley turtle: dorsal (left) and ventral (right) view

(Illustrated in Sea Turtles of India, 2011)



Fig.2. Live Olive ridley turtle (*Lepidochelys olivacea*) sighted in the offshore survey off Maharashtra (Jayasankar et al., 2022)

Green turtle(*Chelonia mydas*)

The Green turtles are found globally in tropical and subtropical waters. The species is renowned for its distinctive characteristics, and they exhibit nesting preferences on tropical beaches, encompassing both mainland and remote islands. They are frequently observed on large, open beaches to small cove beaches, with prominent nesting sites found along the mainland in Gujarat, as well as on beaches throughout the Lakshadweep and Andaman

Islands. Adult Green turtles weigh around 250 kg, featuring a broadly oval carapace with a scalloped margin but not serrated. Their coloration varies, with brown hues and radiating streaks in juveniles, while adults display more variability. The species is recognised by the presence of four pairs of costal scutes, a rounded shape at the anterior of head, and a single claw on each flipper. Hatchlings display a white plastron which gradually turns yellowish as they mature. Additionally, their vertebrates (centrals) are large, preventing the first costal from making contact with the nuchal scute. Green turtles exhibit night nesting behavior, laying 4 to 6 clutches per season, each containing 100 to 120 eggs. The nesting track, measuring 100 to 130 cm wide, exhibits symmetrical diagonal imprints created by the forelimbs, with a tail drag characterized by either a continuous or interrupted line.

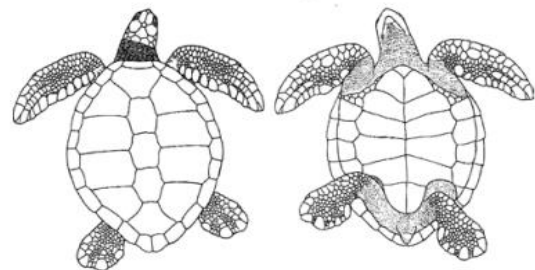


Fig. 3. Green turtle: dorsal (left) and ventral (right) view

(Illustrated in Sea Turtles of India, 2011)

Hawksbill turtle(*Eretmochelys imbricata*)

The Hawksbill turtle has a global distribution and favors nesting on tropical beaches, particularly on remote islands. Hawksbills typically select narrow beaches on islands or mainland shores, often with reefs hindering offshore approaches. Significant nesting sites include Lakshadweep, Andamans, and selected beaches in Nicobar, such as Indira Point in Great Nicobar. Hawksbills often nest under overhanging vegetation, a behavior distinct from ridleys, which prefer open areas. Adult Hawksbill turtles weigh around 150 kg, featuring an oval carapace characterized by a prominently serrated posterior margin and thick, overlapping scutes. Their distinct coloration comprises brown shades boldly marked with amber and brown variegations. The species is distinguished by four pairs of costal scutes with a serrated posterior

border, Hawksbills exhibit a narrow, straight, bird-like beak and possess two claws on each flipper. Their plastron is light yellow to white, and large vertebral (centrals) prevent the first costal from contacting the nuchal scute. Hawksbills display a flexible nesting behavior, choosing both night and day for nesting. They lay 3 to 5 clutches per season, each containing 120 to 150 eggs, with some nests holding up to 180 eggs. The eggs, approximately 3.5 cm in diameter, are laid at intervals of 12 to 14 days. The re-migration interval ranges from 2 to 5 years. The nesting track, measuring 70 to 85 cm wide, is shallow and exhibits asymmetrical (alternating) oblique marks made by forelimbs, while the presence or absence of tail marks varies. Although their tracks may resemble those of ridleys, the beach types they choose for nesting differ significantly.

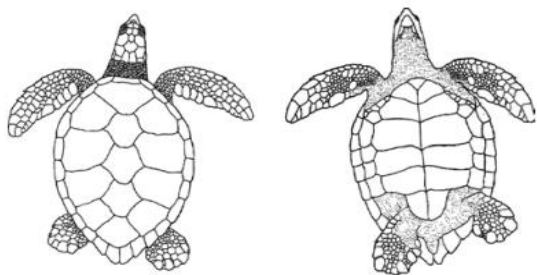


Fig. 4. Hawksbill turtle: dorsal (left) and ventral (right) view

(Illustrated in Sea Turtles of India, 2011)

Loggerhead turtle(*Caretta caretta*)

The Loggerhead turtles are found in tropical waters worldwide. Although it primarily nests in temperate waters, sometimes extending to subtropical and tropical regions. Loggerheads find suitable nesting sites in locations such as Sri Lanka and are not known for nesting in India. These turtles favor extensive mainland beaches or barrier islands for nesting. Adult Loggerheads weigh approximately 200 kg, featuring a moderately broad carapace with a lightly serrated posterior margin in immature. Notably, adults exhibit a thickened area at the base of the 5th vertebra. Their coloration is generally unmarked reddish-brown in subadults and adults. Recognizable by five pairs of costal scutes and a large, broadly triangular head, Loggerheads have two claws on each flipper and a yellow to orange plastron. Unlike some other species, the narrow vertebrates (centrals) allow the first costal to contact the nuchal scute. Loggerheads engage in night nesting behavior, laying 3 to 5 clutches per season, each containing 100 to 120 eggs, with an egg size of

approximately 4 cm in diameter. The re-nesting interval ranges from 12 to 16 days, and the re-migration interval is typically 2 to 3 years. The nesting track, measuring 70 to 90 cm wide and moderately deep, exhibits asymmetrical diagonal marks produced by the forelimbs, typically without the presence of a tail drag mark.

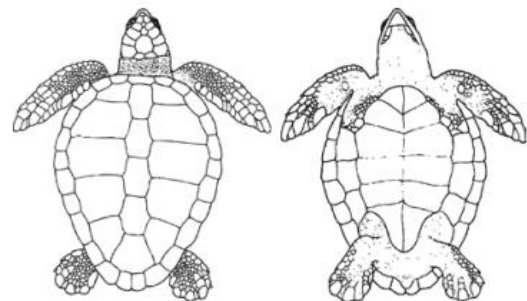


Fig. 5. Hawksbill turtle: dorsal (left) and ventral (right) view

(Illustrated in Sea Turtles of India, 2011)

Leatherback turtle(*Dermochelys coriacea*)

Leatherback turtles have a global distribution spanning all oceans, from sub-arctic to tropical waters. The Leatherback turtle, renowned for its large size, prefers nesting on tropical beaches, especially those with wide expanses, a steep slope, and clear access to deep water devoid of rocks. In India, Leatherback turtles predominantly nest in the Andaman and Nicobar Islands, with primary nesting sites identified at Galathea on the east coast, and various beaches along the west coast of Great Nicobar, Little Nicobar, and Little Andaman Islands. Adult Leatherbacks weigh over 500 kg, boasting an elongated and tapering carapace with seven prominent dorsal ridges. Notably, they lack costal scutes and have a triangular head with two maxillary cusps. Their mostly black coloration is adorned with white spotting, and distinctive pink or bluish spots embellish the base of the neck and flippers. These turtles exhibit unique nesting behavior, with a preference for night nesting, laying 4 to 6 clutches per season, each containing 80 to 100 eggs. The Leatherback turtle's nesting track, measuring 150 to 200 cm wide, is characterized by symmetrical diagonal marks created by the forelimbs and a deep median groove formed by the long tail, making it a fascinating and distinctive species within the marine ecosystem.

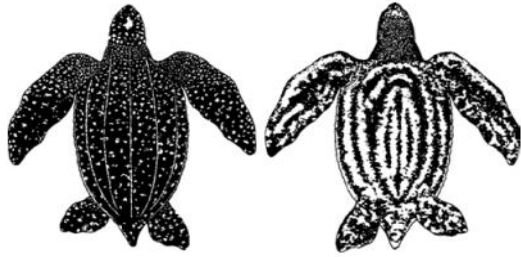


Figure 5. Leatherback turtle: dorsal (left) and ventral (right) view

(Illustrated in *Sea Turtles of India*, 2011).

Conclusion

Sea turtles, representing ancient marine species, contribute significantly to the health of our oceans. Their nesting habits on tropical beaches worldwide serve as a vital link in the complex web of marine life. Sea turtles are faced with multifaceted threats such as over-exploitation, habitat degradation, and incidental catch, the need for comprehensive conservation efforts cannot be overstated. Legislative measures such as the Indian Wildlife (Protection) Act 1972 provide a legal foundation, but the success of conservation initiatives relies heavily on collaborative endeavors involving various stakeholders, local communities, and dedicated research institutions. Sustained commitment is necessary to address persistent challenges such as habitat degradation, developmental activities, and the high incidence of incidental catch. The collaborative efforts of governmental bodies, non-governmental organizations, and local communities are crucial in ensuring the survival of these ancient creatures and fostering sustainable practices that benefit marine ecosystems and human societies alike. As stewards of our oceans, the responsibility to protect and conserve sea turtles lies in our hands, and the positive outcomes seen in certain regions underscore the potential for impactful change with sustained dedication.

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