



A New Locality Record of the Freshwater Turtle *Melanochelys trijuga* (Schweigger, 1812) from Chennai, Tamil Nadu

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There are 24 species of freshwater turtles in India, and they can be found in a variety of environments, including marshes, rivers, lakes, woodlands, deserts, and swamps, which are hotspots for aquatic turtle diversity. Though the Indian coastline is one of the world's freshwater turtle species-rich areas, turtles are harvested, killed, consumed, and trafficked. Significant anthropogenic impacts on these vital turtle habitats include habitat degradation and alteration, increased pollution, climate change, and invasive alien species. As a result, the IUCN Red List now lists over 60% of tortoises as endangered in 2019 (Nithya et al. 2024).

Freshwater turtles are the most abundant species in India and are heavily traded and harvested for food, slaughter, and consumption. *Melanochelys trijuga* (Schweigger, 1812) commonly known as the Indian black turtle or Indian pond terrapin, is a species of turtle found in South Asia. This study aims to collect and compile scientific information about *M. trijuga*. This species is distributed in Bangladesh, Chagos Island, China, India, Maldives, Myanmar, Nepal, Pakistan, Sri Lanka, and Thailand (Das & Bhupathy, 2009). In India previously recorded in Assam, Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Meghalaya, Nagaland, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal (Daniel, 2002). Seven species of freshwater turtles are reported from Chhattisgarh state by Ahmed et al., 2021. They have reported *Chitra indica* Gray, 1831 (Narrow-headed Softshell Turtle), *Lissemys punctata* Lacepede, 1788 (Indian Flap-shell Turtle), *M. tricarinata* Blyth, 1856 (Tricarinate

Hill Turtle), *Nilssionia gangetica* Cuvier, 1825 (Indian Softshell Turtle), *N. leithii* Gray, 1872 (Leith's Softshell Turtle), *Pangshura tecta* Gray, 1831 (Indian Roofed Turtle), and *P. tentoria* Gray, 1834 (Indian Tent turtle).

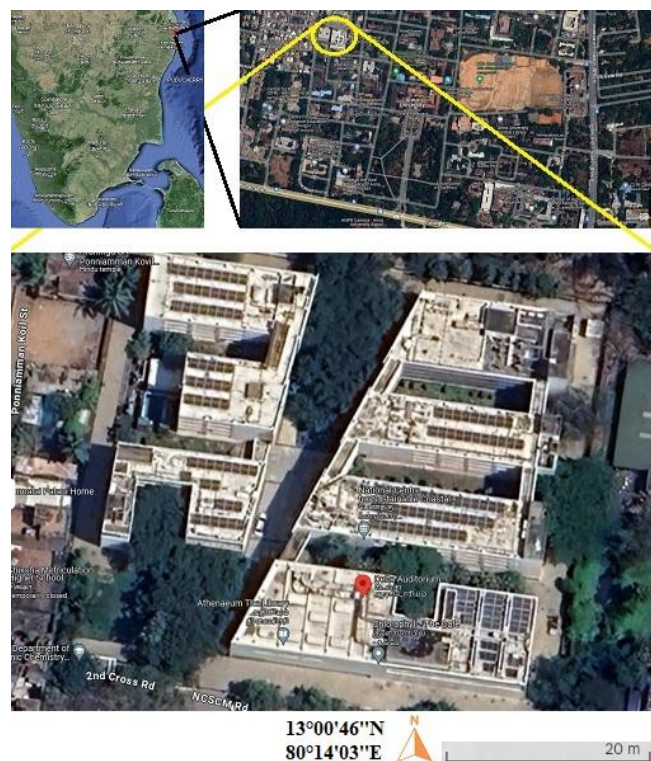


Figure 1: The study map shows the location of the species' observations.

M. trijuga is recorded at the National Centre for Sustainable Coastal Management (NCSCM) on Anna University campus in Chennai, Tamil Nadu (Figure 1). This species was first observed in the campus during the pre-monsoon season on June 22, 2024, at 10:30 am. This study site is located at latitude 13°00'46"N and longitude 80°14'03"E. The still water supports the diversity of plants and animals in the university campus (Vijayan & Anbalagan, 2023). The temperature at this location is approximately 27.9°C (82.1°F), with the annual rainfall in Chennai district being around 52 to 53 cm. This species has been documented solely based on photographic records, following the methodology of Vijayan and Anbalagan (2023).

Several additional photos were taken using a cell phone for identification purposes. After the photographic documentation, the species was left in a nearby area with dense water coverage within the campus. Identification was confirmed using morphological features referenced in previously published research articles. This study advances the understanding of the taxonomy,

distribution, habitat, behaviour, and conservation status of *M. trijuga*. Recent observations also reveal the widespread distribution of this species in Chennai, Tamil Nadu.

Description

Appearance: It is a medium sized turtle, its carapace, or upper shell, is primarily reddish to dark brown or black with streaks of yellow along the length of it. Carapace measures up to 23 cm (Figure 2 & 3). The plastron is uniformly brown on the underside. Depending on the subspecies, the markings and dots on this turtle's face could be yellow, orange, or another color. In the Asian region, there are six subspecies known to exist, and they all have relatively varied head-spot patterns. Size ranges from 38 to 45 cm. Compared to females, males are larger as well as heavier.

Reproduction: Mating typically occurs during the warmer months, often coinciding with the monsoon season when water bodies are full, and food is plentiful. The courtship behaviour includes a series of visual and tactile signals between males and females. Males may follow females and nudge or mount them as part of the courtship ritual. In South India, the Madras region, copulation occurs in July and August during the monsoon season. During courting, the males bite the female necks and napes while near the water's surface of the copulating pair floats (Das & Bhupathy, 2009).

Nesting & Egg laying: Nesting usually occurs shortly after mating, often in the late or post-monsoon season. Females select nesting sites in sandy or soft soil areas near water bodies. The site is usually chosen for its safety and the ease of digging. A typical clutch contains between 2 to 10 eggs, though the number can vary. Using their hind limbs, the females excavate deep nests where they lay an average of 10–30 eggs every clutch (Hamann et al., 2022). The female turtles return to water after covering the eggs properly, allowing them to incubate (Nithya et al., 2024).

Egg incubation & Hatching: The incubation period ranges from 60 to 90 days, depending on environmental conditions such as temperature and humidity (Spencer & Janzen, 2011). The temperature of the nest can influence the sex of the hatchlings, a phenomenon known as temperature-dependent sex determination. Hatchlings dig their way out of the nest and make their way to the water, often at night to avoid predators. Hatchlings are miniature versions of adults, though their coloration may be lighter, and they are more vulnerable to predators.

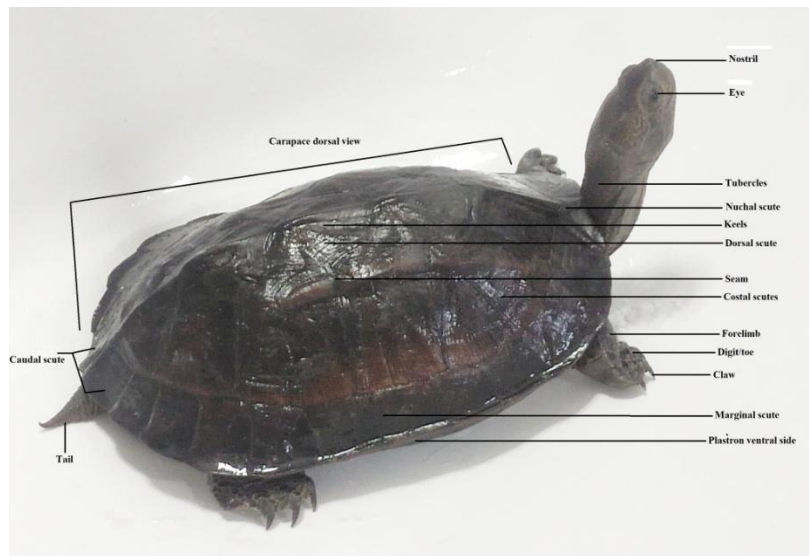


Figure 2: Comprehensive image of *M. trijuga*, along with other characteristics that are essential for differentiating hardshell turtles.



Figure 3: An unobscured, complete dorsal view of the carapace.

Survival & Growth: There is no parental care after the eggs are laid. Hatchlings are independent and must fend for themselves immediately upon hatching. Juveniles grow rapidly in their early years, reaching sexual maturity in 5 to 8 years. The lifespan of *M. trijuga* can extend to several decades under favourable conditions (Nithya et al., 2024).

Habitat: This species is found in a variety of freshwater habitats, including ponds, lakes, rivers, and marshes. They prefer slow-moving or still waters with abundant vegetation

Diet: They are omnivorous, feeding on aquatic plants, small fish, insects, and other invertebrates. These turtles in Sri Lanka eat fallen fruits, fish trapped in kraals, animal faces, snails, insect larvae, and garbage-washed drain mouths (Deraniyagala, 1939).

Behavior: *M. trijuga* is primarily diurnal, active during the day. They are known to bask on logs or rocks near the water. In South India, the species exhibits a nocturnal lifestyle, with individuals foraging after dark along the edges of water bodies in the region south of Madras. In other parts of its range, after foraging, turtles remain near the edge of water bodies entirely or out of water overnight (Bhupathi unpublished data). Turtles excrete a lot, similar to land tortoises, as a defensive reaction when disturbed. They may also occasionally release a foul-smelling liquid from the intestinal openings (Das & Bhupathy, 2009).

Threats

Freshwater turtles are at acute threat in Nepal and India. Previous study reported anthropogenic impact and hunting seem to be serious threats to turtles (Rhodin et al., 2021; Pun et al., 2023, Vijayan et al., 2024). *M. trijuga* species is commercially harvested for food in north-eastern India, and tribal groups hunt it for subsistence in what is known as the Western Ghats of both north-eastern and south-western India (Das, 1991; Pawar & Choudhury, 2000). The species is widely used by the locals in the Northern part of West Bengal, particularly in the area surrounding Gorumara National Park, as shown by the abundance of shells found in village livestock sheds. The flesh of this species is sold in liquor stores, and it is widely collected in Kerala. A 100g portion of prepared meat fry could cost roughly 50 Indian Rupees. In Thiruvendran, Kerala, a pet store listed one hatchling for sale for Indian Rupees 40 (Choudhury & Bhupathy, 1993); however, 499 individuals hatchling is sold in the pet trade (Krishnakumar et al., 2009).

Although they are common in protected places, turtles are endangered in some sections of Sri Lanka. Its status is unknown in Bangladesh and local exploitation is thought to represent a threat to the species. Its use as food has been documented in western Myanmar (Platt et al., 2001). As observed in Bardia National Park, fires are started purposefully or unintentionally in Nepal during the dry season turtles during the growing season, it is known to kill these turtles (Mitchell & Rhodin, 1996). These writers also noted the trade-in souvenir masks for visitors manufactured from this species' shells in Kathmandu, Nepal. Yoseph et al. (2023) surveyed the threat posed by transport or road kills of *M. trijuga* in the Mannur Reserve Forest (MRF) near

Kanchipuram, Tamil Nadu. It's a new record and evidence of anthropogenic threat to *M. trijuga*.

Conservation status

Melanochelys trijuga is listed in the Red Data Book of Nepal (Shah and Tiwari, 2004). The species is currently not included in the appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Previous assessments categorized *M. trijuga* as Near Threatened (NT) on the IUCN Red List of Threatened Species (Das and Bhupathy, 2009; Nithya et al., 2024). However, the most recent evaluation by the International Union for Conservation of Nature reclassified the species as Least Concern (LC), reflecting a reassessment of its conservation status.

Despite this revised classification, continued monitoring and research are necessary to better understand the species' population trends and potential threats. In particular, the extent of its utilization in wildlife trade within India should be evaluated. Furthermore, comprehensive surveys on population status and distribution are recommended across the species' range. Such surveys are especially important in Tamil Nadu, where recent and reliable population data are lacking. Additionally, applying multiple phylogeographic and molecular approaches could help clarify evolutionary relationships among currently recognized populations and closely related taxa, thereby contributing to more effective conservation planning.

Discussion

Das (unpublished data) initially noticed *M. trijuga* in the Chennai, Tamil Nadu. This unpublished data only shows the earliest study confirming the record of Indian Black Turtle. However, no evidence was found in this research. The other research is relevant to subspecies categories. Following that, *M. trijuga coronata* nesting records in January from southwest India, a few observations from Vijaya (1982). Sundar (1984) found that subspecies of *M. trijuga trijuga* nests in the Chennai region of south-eastern India in October. According to Das and Pritchard (1990), two intergradient specimens of *M. trijuga* and *M. t. coronata* were discovered in the Southern Regional Station collection of the Zoological Survey of India, Madras, in 1987. In 1989, M. Vasant and Party had both collected these species. These species were gathered in Tamil Nadu's Tirunelveli district, in the Western Ghats of Kalakkadu Wildlife Sanctuary. They are pond turtles, which are found in areas with low elevation, especially in the Western Ghats. Das (1990) reported finding a piece of a turtle shell from the Indira Gandhi

Wildlife Sanctuary in Pollachi, Tamil Nadu. Subsequently, Rathnasabapathy et al. (1993) investigated Indian Black Turtle breeding behaviours in Chennai area. Protection of freshwater turtles, Krishnakumar et al. (2009) wetlands turtles are trade and exploitation in Punnamada, Kerala. A master plan was then suggested by Vijayaraghavan (2013) for Chennai Snake Park. *M. trijuga* is one of the species of reptiles that are present in this snake park. Ten years later, the district of Kanchipuram, which is 40 km away from Chennai, the capital of Tamil Nadu, documented *M. trijuga* roadways killed by anthropogenic impact with photographic evidence (Yoseph et al., 2023). According to Nithya et al., 2024 a recent diversity survey of *M. trijuga* was done near Kallakurichi district, Tamil Nadu. The current study, performed in the Chennai district of Tamil Nadu, India, recently updated the status of *M. trijuga*. This is the first photograph document after 30 years in Chennai district, Tamil Nadu. The present study offers a baseline for the following *M. trijuga* investigations in this area and providing a thorough understanding of *M. trijuga* life cycle and behaviour. This species shows Palearctic and Oriental distribution, and it enlightens our further understanding of the freshwater species in these biogeographical regions. According to Karunarathna et al. (2017), conservation efforts should be concentrated on protecting and restoring appropriate nesting habitats, reducing pollution, and enforcing laws against the illegal trade of *M. trijuga*. Therefore, it is crucial to conduct such studies to evaluate the current state of freshwater turtle diversity locally. A proactive mindset toward conservation can also be fostered by teaching local populations and educational institutions about the significance of this species and its crucial function in preserving environmental equilibrium.

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