

Chapter 5

Aquatic fodder plants of the Indian tent turtle

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Abstract: The present study documents and analyses the diversity of aquatic fodder plants consumed by the Indian tent turtle (*Pangshura tentoria*), a semi-aquatic species widely distributed across freshwater bodies of the Indian subcontinent. Field observations across Bihar, Jharkhand, and Odisha states during January 2025 to October 2025 revealed a total of 12 plant species belonging to 8 families that are consumed by the Indian tent turtle. Among these, species such as *Hydrilla verticillata*, *Ceratophyllum demersum*, and *Vallisneria natans* were frequently observed as major dietary components, indicating a preference for submerged and soft-leaved hydrophytes. Floating species like *Lemna minor*, *Pistia stratiotes*, and *Wolffia globosa* also formed a significant part of the diet, providing easily accessible and nutrient-rich food sources. The wide range of consumed plants signifies the turtle's adaptive feeding behaviour and its ecological role in maintaining aquatic vegetation balance. The study brings out the importance of aquatic plant diversity for the survival and health of *P. tentoria*, as these plants contribute to its nutrition, habitat structure, and ecosystem functioning. Conserving diverse aquatic plant communities is therefore crucial for ensuring the sustainability of freshwater turtle populations and the ecological stability of their habitats.

Keywords: *Pangshura tentoria*, aquatic vegetation, feeding ecology, freshwater turtles, conservation.

Introduction

Aquatic vegetation plays a crucial role in the ecology and nutrition of freshwater turtles, serving as both a primary food source and habitat component (Parks et al., 2024). Turtles play an important role in balancing the aquatic ecosystem. They generally feed on aquatic weeds and keep the water surface clean, which facilitates all the life processes to be carried out without any hindrance, which keeps the aquatic environment healthy and thriving (Santori et al., 2020). The Indian tent turtle (*Pangshura tentoria*),

a semi-aquatic species widely distributed across rivers, ponds, and wetlands of the Indian subcontinent, exhibits a predominantly herbivorous feeding habit, particularly in its adult stages (Gokulakrishnan et al., 2025; Figure 1). Mainly, the adult females are herbivorous, feeding on aquatic weeds; however, the adult males and juveniles are more carnivorous, i.e., they may consume small invertebrates and fish (Narain et al., 2006). Among its dietary components, aquatic vegetation provides essential nutrients such as proteins, fibers, and minerals that are vital for growth, shell formation, and overall metabolic health (Lattimer and Haub, 2010). The availability and diversity of aquatic fodder plants directly influence the distribution, feeding behaviour, and population dynamics of *P. tentoria* (Choudhury et al., 2021). These turtles consume a variety of submerged, floating, and emergent hydrophytes, which offer both nutritional and ecological benefits. Plants like *Hydrilla verticillata*, *Ceratophyllum demersum*, and *Lemna minor* not only form a staple diet but also serve as microhabitats for small invertebrates, indirectly enhancing the food web complexity (Choudhury et al., 2021). Understanding the composition of aquatic fodder plants is therefore essential for assessing the ecological requirements and habitat quality of this species.

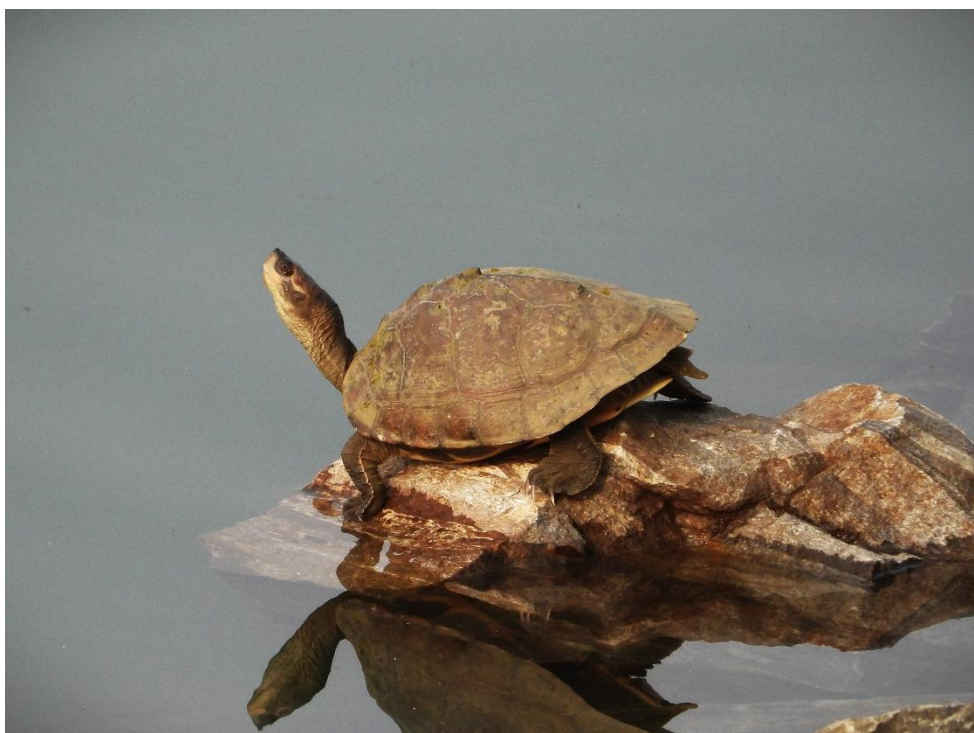


Figure 1: Indian tent turtle

Documentation of the plant species utilised by *P. tentoria* helps in developing effective conservation strategies, particularly when confronted with issues like habitat degradation and aquatic pollution. Such knowledge contributes to better management of freshwater ecosystems, ensuring the sustenance of both the turtle populations and their aquatic plant resources.

Methodology

Field surveys were conducted in Bihar, Jharkhand, and Odisha to study the fodder plants of the Indian tent turtle and the threats associated with its feeding habits from January 2025 to October 2025, which are contributing to its declining population. To analyse measures for the conservation of the Indian tent turtle population in their habitat, aquatic plants were enumerated and tabulated. The plants were identified by Dr. Sanjeet Kumar, and the turtle was identified and confirmed from published literature (Kumar et al., 2022; Purkayastha et al., 2015).

Results and discussion

A total of 12 aquatic plant species belonging to 8 different families were identified as part of the natural fodder diet of the Indian tent turtle (*Pangshura tentoria*). Among these, the family Hydrocharitaceae was represented by the highest number of species, indicating the turtles' preference for submerged hydrophytes. The recorded plants included both submerged and free-floating aquatic vegetation, reflecting the diverse aquatic habitats the species occupies. Most of the plants consumed by the turtle, such as *Hydrilla verticillata*, *Ceratophyllum demersum*, and *Vallisneria spiralis* (Figure 2), are known for their high protein and mineral content, which contribute to the turtle's growth and physiological maintenance. Floating species like *Lemna minor*, *Pistia stratiotes*, and *Wolffia globosa* also form a significant part of the diet, providing essential micronutrients and readily digestible biomass. The inclusion of *Trapa natans* (water chestnut) suggests opportunistic feeding behaviour, where the turtle may feed on tender leaves available at the water surface. The diversity of aquatic fodder plants highlights the adaptive feeding ecology of the Indian tent turtle, allowing it to thrive in a range of freshwater ecosystems. The predominance of soft-leaved hydrophytes indicates selective grazing on easily accessible and digestible vegetation. These findings not only provide insight into the species' dietary preferences but also emphasise the ecological importance of maintaining aquatic plant diversity for sustaining freshwater turtle populations. Some researchers have documented the feeding habits of the Indian tent turtle, like Choudhury et al., (2021) have documented the consumption of aquatic vegetation, namely *Eichhornia* spp., *Pistia* spp.,

Salvinia spp., as fodder plants. However, very few works have been done on this particular research area.

Table 1: Enumerated aquatic fodder plants of the Indian tent turtle

Botanical name	Common name	Family	Parts consumed
<i>Aponogeton natans</i>	Floating lace plant	Aponogetonaceae	Leaves
<i>Blyxa echinosperma</i>	Linear-fruit blyxa	Hydrocharitaceae	Leaves
<i>Ceratophyllum demersum</i>	Coontail	Ceratophyllaceae	Whole plant
<i>Hydrilla verticillata</i>	Waterthymes	Hydrocharitaceae	Whole plant
<i>Lemna minor</i>	Common duckweed	Araceae	Leaves
<i>Pistia stratiotes</i>	Water lettuce	Araceae	Leaves
<i>Pontederia crassipes</i>	Water hyacinth	Pontederiaceae	Leaves
<i>Potamogeton nodosus</i>	Long-leaved pondweed	Potamogetonaceae	Leaves
<i>Salvinia cucullata</i>	Asian watermoss	Salviniaceae	Leaves
<i>Trapa natans</i>	Water chestnut	Lythraceae	Leaves
<i>Vallisneria natans</i>	Asian tape grass	Hydrocharitaceae	Leaves
<i>Wolffia globosa</i>	Asian watermeal	Araceae	Whole plant



Figure 2: Indian tent turtle feeding on *Vallisneria natans* leaves

Conclusion

The present study documents the rich diversity of aquatic fodder plants utilised by the Indian tent turtle (*Pangshura tentoria*), signifying the species' dependence on a variety of submerged and floating vegetation for sustenance. The predominance of soft-leaved hydrophytes such as *H. verticillata*, *C. demersum*, and *V. natans* emphasises the preference of the Indian tent turtle for easily digestible and nutrient-rich vegetation. The findings indicate that the dietary composition of *P. tentoria* is closely linked to the availability and diversity of aquatic flora in its habitat. The consumption of these plants not only fulfils nutritional requirements but also plays a vital role in maintaining the ecological balance of aquatic environments through vegetation control and nutrient cycling. Preservation of aquatic plant diversity is therefore essential for sustaining healthy populations of the Indian tent turtle. The documentation of aquatic fodder plants provides valuable insight into the feeding habits of *P. tentoria*, contributing to the broader understanding of freshwater turtle conservation. Future research should focus on seasonal variations in diet, nutritional analysis of consumed plants, and the impact of habitat alteration on food availability, which would further

aid in developing effective conservation and habitat restoration strategies for this ecologically significant species.

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