



Nocturnal Emergence of Small Freshwater Turtles in Temple Ponds in Assam, India: A Strategy to Avoid Aggression and Predation by Large Softshells?

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Large carnivorous soft-shelled turtles in the genus *Nilssonina* (average carapace lengths of 70–90 cm) are known for their aggression and predation of vulnerable hatchling and juvenile turtles, especially in confined bodies of water such as artificial tanks or earthen ponds (Rao et al. 1986; Ahmad and Das 2010). The Nagshankar Temple in the Biswanath District, Assam, India (26°43'29.3"N, 92°59'39.8"E) has two earthen ponds (each 4,675 m²) that house over 250 freshwater turtles received as donations. Species include large soft-shelled turtles such as the Indian Softshell (*Nilssonina gangetica*), the Indian Peacock Softshell (*N. hurum*), and the Black Softshell (*N. nigricans*).

During a 37-night pilot study from 20 February to 28 March 2019, we observed the nocturnal behavior and nesting activities of soft-shelled turtles from 1600 h to 0500 h each night. In the course of those observations, we encoun-

tered a total of 81 juvenile and hatchling turtles in the genera *Pangshura* and *Nilssonina* that emerged from the water to rest on logs or branches or completely left the main pond (Fig. 1; Table 1).

We believe that the smaller turtles, such as the Assam Roofed Turtle (*Pangshura sylhetensis*) and the Indian Tent Turtle (*P. tentoria*), with carapace lengths of 6–12 cm, emerge from the water or leave the pond to avoid aggression and possible predation by larger softshells. Turtles that leave the pond spend the night in adjacent puddles before returning to the pond in the morning. However, we cannot rule out the possibility that these forays might involve feeding or extended thermoregulation in light of the high densities and competition for resources in the pond. Other than nesting adult female Black Softshells, we did not encounter any large turtles (carapace lengths >15 cm) emerging from the pond

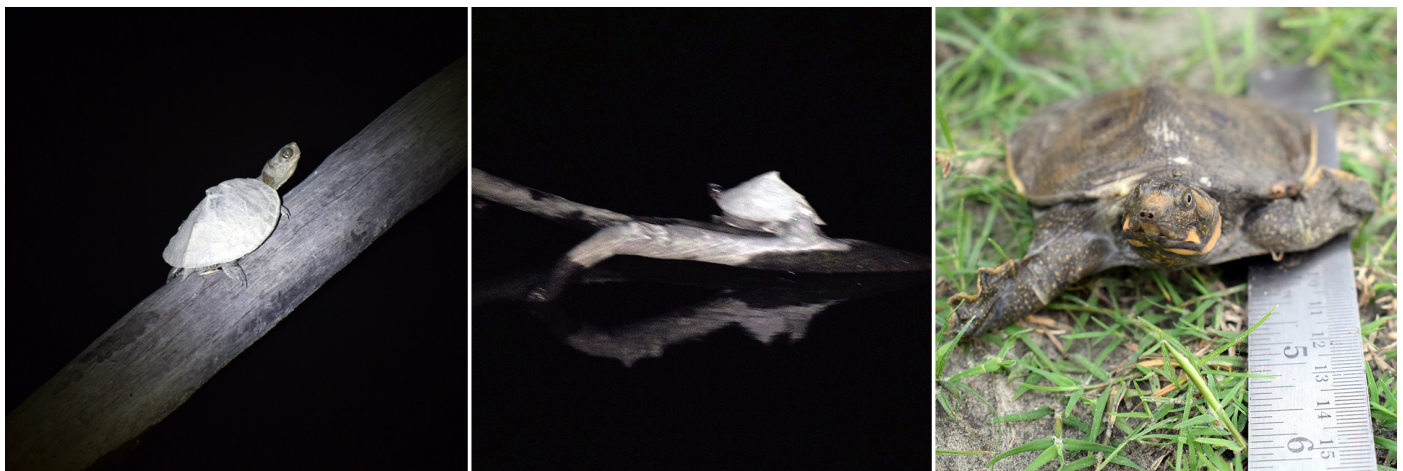


Fig. 1. A juvenile Indian Tent Turtle (*Pangshura tentoria*) on a log near the main wetland at night (left); a juvenile Assam Roofed turtle (*Pangshura sylhetensis*) on a submerged branch at night (center), and a juvenile Black Softshell (*Nilssonina nigricans*) that emerged from the main pond during evening hours. Photographs by Gaurav Barhadiya.

Table 1. Number and species of Turtles emerging at night from the main pond. Abbreviations: Nn: *Nilssonia nigricans*, Nh: *Nilssonia hurum*, Ng: *Nilssonia gangetica*, Ps: *Pangshura sylhetensis*, Pt: *Pangshura tentoria*.

Survey Dates (2019)	Species	Size (age)	Total Number of Individuals
20–26 February	Nn, Pt, Ps	Juveniles	11
27 February–6 March	Nh, Nh, Pt	Juveniles	16
7–13 March	Nn, Pt, Ps	Hatchlings and Juveniles	12
14–20 March	Ng, Pt, Ps	Juveniles	24
21–28 March	Nn, Pt, Ps	Hatchlings and Juveniles	18

during the night. Since we did observe large softshells attacking smaller hatchlings and juveniles, the assumption that the smaller turtles leave the water or the pond to avoid predation by aggressive and nocturnally active softshells is reasonable.

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