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Title New records of Leith's softshell turtle, *Nilssonia leithii* (Gray, 1872), after 30 years from Kaveri River delta in Tamil Nadu, India

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Abstract *Nilssonia leithii* is an endemic species of softshell turtle from peninsular India, and though it has a widespread distribution, it is often difficult to spot. We are reporting two new records of Leith's softshell turtle (*Nilssonia leithii*) from the Kaveri River in Tamil Nadu. These sightings have been made at a site 110 km upstream from the estuary. The last time this species was sighted in the Kaveri Delta region was 30 years ago.

Keywords conservation, distribution, new records, softshell turtle

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Introduction

The Indian state of Tamil Nadu is home to six freshwater turtles. *Nilssonina leithii* and *Pelochelys cantorii* are two giant soft-shelled turtles distributed in the Kaveri River (Kalaiarasan et al. 1992; Melvinselvan and Nibedita 2017). *Nilssonina leithii* is endemic to peninsular India (Das 1995; Das et al. 2014) and was first described by Gray in 1872, based on a specimen collected by Dr. Leith from Poonah (now Pune), Maharashtra (Gray 1872). *Nilssonina leithii* is primarily found in rivers and reservoirs (Boulenger 1890; Annandale 1915; Moll and Vijaya 1986; Kalaiarasan et al. 1992; Thomas et al. 1997; Kumar 2004; Nameer et al. 2007; Praschag et al. 2007; Deepak and Vasudevan 2009). However, an individual was also recorded from Thrissur District, at the mouth of the Chalakudy River, suggestive of its occasional usage of estuarine habitats (Das et al. 2014). *Nilssonina leithii* is an elusive animal, difficult to spot even in protected areas. This could be due to the history of exploitation (Das et al. 2014). Two *N. leithii* were dug up from mud in the pool bed just after the winter months (dry season of the year) in the Nallamala Hills of the Eastern Ghats (Annandale 1915), suggesting that the species may aestivate during summer (Das et al. 2014). *Nilssonina leithii* has been reported from the Kaveri and Vaigai rivers in Tamil Nadu; Krishna and Godavari rivers in Andhra Pradesh; Thungabhadra, Neethravathi, and Kaveri rivers in Karnataka; Chalakudy, Bharathapuzha, and Chaliyar rivers in Kerala; Pawna river in Maharashtra; and the Godavari river in Orissa (Gray 1872; Boulenger 1890; Moll and Vijaya 1986; Kalaiarasan et al. 1992; Thomas et al. 1997; Kumar 2004; Vasudevan et al. 2006; Nameer et al. 2007; Praschag et al. 2007; Deepak and Vasudevan 2009; Chandra et al. 2021; Mohan et al. 2021; R. Whittaker pers. comm.).

Despite being widely spread in peninsular India, data on this species' status, distribution, and ecology is sparse. It is locally exploited for food throughout peninsular India (Kumar 2004). They are under Schedule I of the Indian Wildlife (Protection) Act of 2022 (amended). Major threats faced by the species include the unchecked consumption of turtle meat, habitat alteration, and destruction throughout its distribution, and the drastically changing riverine ecosystems due to various anthropogenic activities including pollution, sand mining, and other developmental structures such as dams (IUCN/SSC Tortoise and Freshwater Turtle Specialist Group and Asian Turtle Trade Working Group 2000). The species is listed as "Critically Endangered" in the IUCN Red List, and *N. leithii* is declining throughout its range (Praschag et al. 2021). The last known record of this species from Tamil Nadu was during a short survey conducted at various locations near Thanjavur district between August, December 1990 and March 1991. A single specimen of *N. leithii* was caught from the Coleroon River by a local fisherman and was sold near Kollidam village, Sirkazhi, Tamil Nadu (Kalaiarasan et al. 1992). Since then, no sightings of the species from the Kaveri delta region have been recorded.

The Grand Anicut Dam region was surveyed to assess the population status of *Pelochelys cantorii* in the Kaveri River, Tamil Nadu. During our surveys, we came across two *N. leithii* individuals, from both Vennaru and Kaveri — two different distributaries of the river Kaveri. (Figure 1) *Nilssonina leithii* was identified based on unique characteristics such as the presence of yellowish-red or orange spots on the corner of the mouth and the distinctive head shape, with the help of photographs.

Methods

Study area: Kaveri originates from southwestern Karnataka in the Brahmagiri range of Western Ghats and flows 800 km through Karnataka and Tamil Nadu, emptying into the Bay of Bengal (Singh and Rajamani 2001). Within Tamil Nadu, only a tiny stretch of the river falls in the relatively less exploited part of the river; the rest of the river flows through heavily populated regions of the state. Like many perennial rivers in India, the river course is polluted by industries along the river banks and disrupted by heavy sand mining. In Tamil Nadu, the river is dammed for irrigation at twelve locations, which also includes India's oldest and most functioning dam, the Grand Anicut built by King Kari Kala Chozhan. From Grand Anicut, the river splits into the four distributaries Kaveri, Kollidam, Vennaru, and Pudhu aaru. This region experiences the southwest monsoon from June to September and the northeast monsoon from October to December.

Field survey: In the summer of 2021 (April–June), we surveyed the Grand Anicut region. We carried out a visual encounter survey in the distributaries of the river Kaveri at the Grand Anicut dam, searching for basking turtles on the river bank and looking for the tracks on the sandy banks left during basking. Direct sightings of the turtles were made in the river when they surfaced for breathing.

Areas with sandbanks and deep waters in the river were considered suitable habitats for the turtles, and during the summer months, the water flow is low in most parts of the river, with only certain regions having enough flowing water suitable for these turtles. These habitats were regularly monitored in the early mornings and late evenings for direct and indirect signs of turtles. All the turtle sightings were photographed with a Canon 600D camera, and the GPS coordinates of the locations were noted using a Garmin GPS (GPSMAP 66st).

Results & Discussion

Our sightings are from the distributaries Vennaru and Kaveri near the Grand Anicut dam. On 16th April 2021, a turtle with a shell length of approximately 60–70 cm was sighted at Vennaru River (N 10.82 E 078.82) in a pool when it surfaced for breathing. It was identified as *N. leithii*, with photographs of the turtle head taken while surfacing. The second sighting was on 21st April 2021, at a village called Koviladi (N 10.83 E 078.88; Figure 2). The region where both turtles were sighted was approximately 125 km from the river estuary. Both sites had similar characteristics — approximately four to five-meter-tall sandbanks with five-meter-deep waters. The rivers in these sites were narrow compared to other regions (Figure 3). Both *N. leithii* and *P. cantorii* were spotted at these locations. The turtles surfaced frequently and were observed feeding on the invasive "*Tilapia*" and other small unidentified fishes in the region. Data on the status, distribution, and biology of *N. leithii* is lacking, and these large softshells are locally exploited throughout peninsular India (Kumar 2004). Extensive surveys are needed to identify breeding populations and the threats that these possibly last remaining populations face in Tamil Nadu.

Nilssonina leithii was first reported in Tamil Nadu state in 1991 (Kalaiarasan 1991). Since then, there have been only two additional records from the state (Table 1) and none from the Kaveri delta region.

S. No	Location	Year	Individuals	Remark
1	Coleroon River, Sirkazhi	1991	1	Single specimen (Kalaiarasan et al. 1992)
2	Moyar River, Thengumarahada	1994	2	Two hatchlings; Sirsi, <i>unpubl. data</i>
3	Possible origin Vaigai River. Seized at Udumalaipet range, Anamalai Tiger Reserve.	2009	2	Two adults were poached and confiscated; V. Deepak, <i>pers. obs.</i> in Deepak and Vasudevan 2009.
4	Kaveri	2021	1	This study
5	Vennaru	2021	1	This study

Table 1. Previous and recent observations of *Nilssonia leithii* from Tamil Nadu, India

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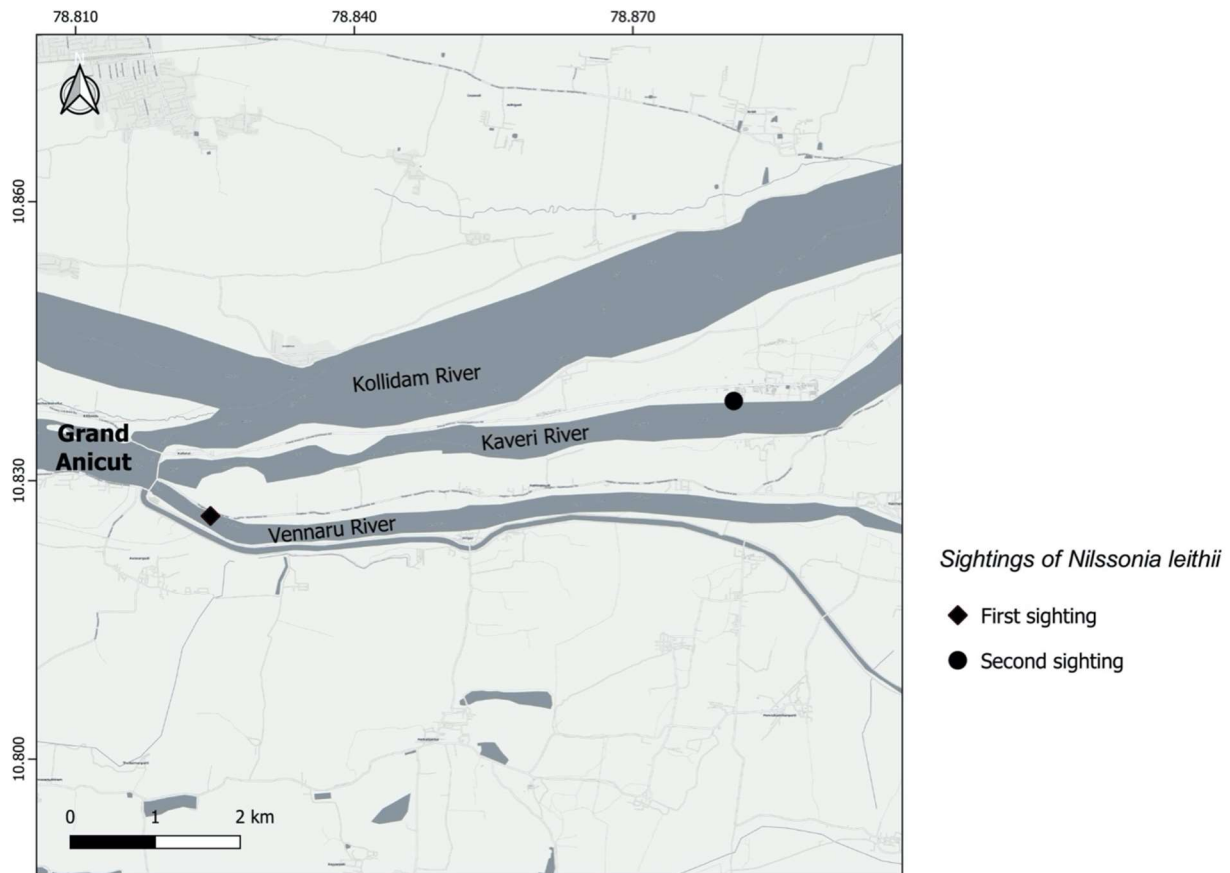


Figure 1. Sites where *Nilssonina leithii* were recorded during this survey.

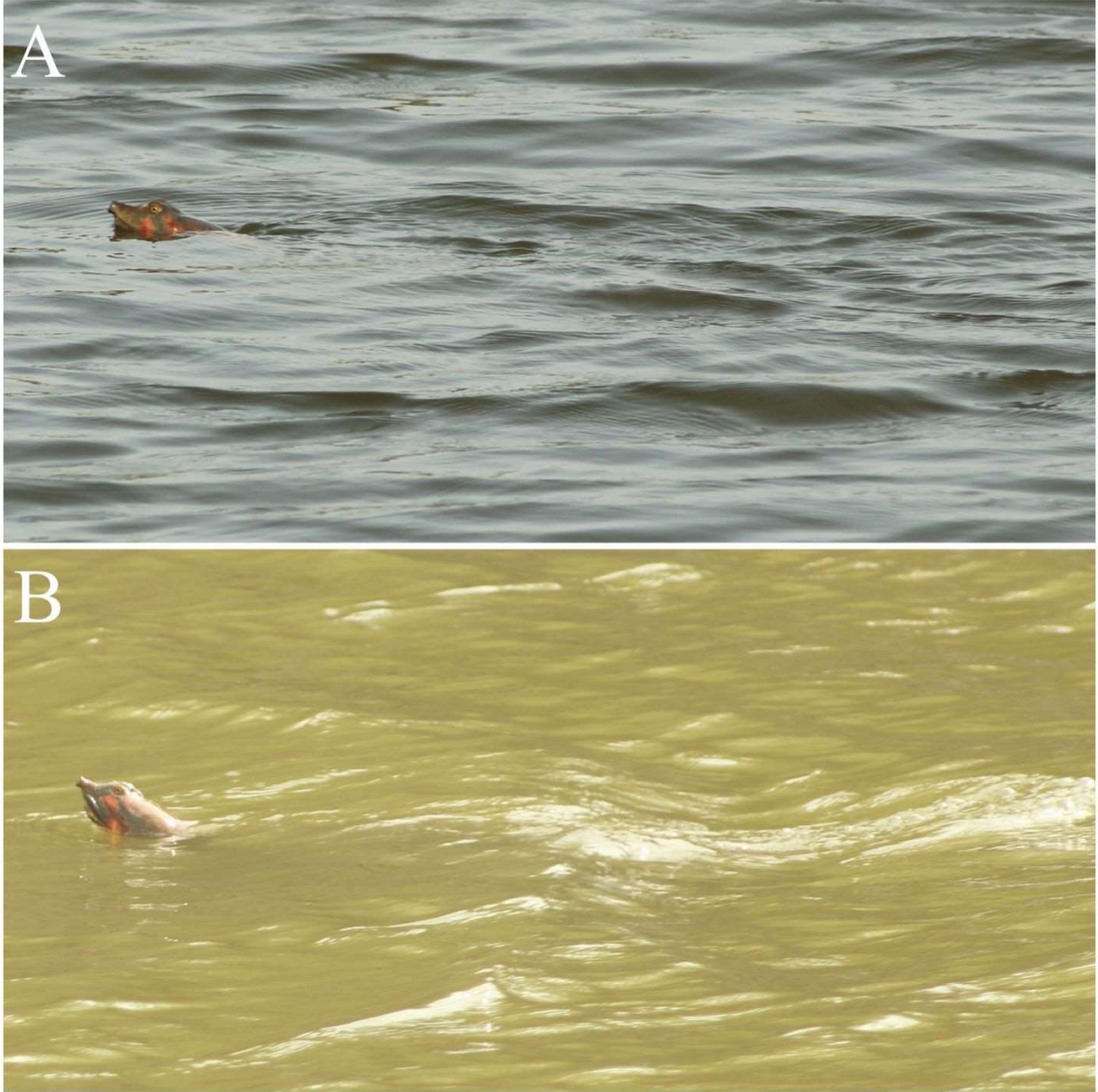


Figure 2. Top - *Nilssonia leithii* sighted at **A.** Vennaru River and **B.** Kaveri River.



Figure 3. Microhabitat in Vennaru River where individuals of *Nilssonia leithii* were recorded.