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*Vachellia nilotica*



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Cover: Parts of *Vachellia nilotica*, medium - watercolours. © P Kritika





sedimentation, pollution, loss of aquatic vegetation, and alteration of hydrological regimes (Srinidhi et al. 2021, 2022).

#### MATERIALS AND METHODS

A common strainer was employed to collect the specimens of *Methles indicus* from the shores of Ameenpur Lake (17.528° N, 78.329° E) biodiversity heritage site, Hyderabad, Telangana (Image 1). The collected specimens of *Methles indicus* were stored in 70% ethanol. Leica EZ4 and Leica M205A microscopes were used for observing and dissecting the specimens. Habitat photographs were captured using a Canon D500 DSLR camera. Species identification was carried out using the standard taxonomic keys provided by Régimbart (1889) and Shankar et al. (2024). Collected specimens were identified, registered, and deposited in the National Zoological Collection of Freshwater Biology Regional Centre, Zoological Survey of India, Hyderabad.

#### RESULTS AND DISCUSSION

Taxonomic treatment

Family: Dytiscidae Sharp, 1882

Genus: *Methles* Sharp, 1882

*Methles indicus* Régimbart, 1899

#### Material examined

Two males, three females, Ameenpur Lake, Ranga Reddy, Telangana (17.528° N 78.329° E), 10.ii.2022, Leg.: D. Jaiswal & S. Shankar, Reg. No. FBRC/ZSI/INS/5260.

#### Distribution

Oriental region (India [Bihar, Jharkhand, Odisha, Telangana, West Bengal]) (Régimbart 1889; Vazirani 1970; Shankar et al. 2024).

*Methles indicus* originally described from Chota Nagpur Plateau, Jharkhand, later recorded from Kolkata, West Bengal, and most recently it has been documented from Sakti Waterfall, Jeypore, Odisha (Shankar et al.



Image 1. Dorsal and ventral habitus of *Methles indicus*. © Shiva Shankar.





Image 2. Sampling site at Ameenpur Lake: A—Photo was taken during the first field survey (10.ii.2022) | B—Photo taken in recent survey (13. iv.2024). © Shiva Shankar.

2024).

Anthropogenic activity is becoming the foremost threat to aquatic biodiversity (Bashir et al. 2020). The main threat to biodiversity is habitat degradation, changes in land use, fragmentation, and pollution (IUCN 2024). In this current study we highlight the habitat loss and its effects on biodiversity. In the year of 2022, we conducted a first field survey in the banks of Ameenpur Lake to study the aquatic beetle diversity and their distribution. During the field survey to Ameenpur Lake, five individuals of *Methles indicus* were collected from small pools which are part of the lake. Since then, multiple attempts have been made to recollect the

species from the banks of this lake but failed, suggesting its local extinction from the habitat. The sampling sites are now encroached and buildings constructed which has resulted in the elimination of small pools and species from the lake (Image 2). However, more survey was undertaken in the banks of adjacent water bodies, i.e., Himayat Sagar Lake (25 km south of Ameenpur Lake), Osman Sagar Lake (24 km south of Ameenpur Lake), RK Puram Cheruvu (28 km east of Ameenpur Lake), Shamirpet Lake (35 km north-east of Ameenpur Lake), and Turkayamjal Masab Cheruvu (48 km south-east of Ameenpur Lake) to know the occurrence of the species but ended up with no collections of the

species. The causes of species elimination from its habitat can be attributed to many interrelated factors; first and foremost, habitat destruction or fragmentation, including encroachment and construction has rapidly eliminated shallow littoral zones essential for the beetle's life cycle. Water quality plays a significant role in the aquatic ecosystem; pollution in water that is derived from construction debris, chemicals, and sewage has degraded water quality beyond the tolerance limits of sensitive aquatic beetles (Burgehelea 2011). Absence of submerged and emergent floral species has reduced shelter, breeding sites, and food resources to the aquatic beetles. Changes in water flow and depth disrupt the ecological stability required for aquatic beetle populations. The local elimination of *Methles indicus* is not merely the loss of a single species but an indicator of broader ecosystem degradation. Aquatic beetles are key components to freshwater food chain, webs (Dong et al. 2014), and their decline indicates declining water quality and ecosystem resilience (Roth et al. 2020). Such losses may precede further declines in other aquatic organisms, including fish and amphibians. Immediate actions are required at the habitat level to preserve the biodiversity of Ameenpur Lake; strict action should be taken on further encroachment and construction. The biodiversity heritage site authority and the government should take necessary action to restoration of littoral and wetland vegetation. Regular biodiversity monitoring activities, particularly of indicator species need to be undertaken. Awareness among the local community and involvement in lake conservation need to be promoted. Environmental protection laws must be strongly implemented.

The elimination of *Methles indicus* from the banks of Ameenpur Lake highlights the negative impact of unchecked urban development on the banks of freshwater biodiversity and ecosystem. Protecting remaining habitats and restoring degraded wetlands are important to preventing further local extinctions. This case study underscores the urgent need to balance urban growth with ecological sustainability, especially in legally protected biodiversity sites.

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