DNA barcoding reveals unprecedented diversity in Dancing Frogs of India (Micrixalidae, *Micrixalus*): a taxonomic revision with description of 14 new species

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ABSTRACT

In this study, we investigate species level diversity in the monotypic frog family Micrixalidae, which is endemic to the Western Ghats of Peninsular India. Attempting the first near-complete taxon sampling of Indian dancing frogs from the entire Western Ghats, we use 138 tissue samples collected from 70 localities over the last 12 years for DNA barcoding. Our results of multiple mitochondrial gene (16S and COI) barcoding reveal unexpectedly high species level diversity in the genus *Micrixalus*. Based on molecular and morphological evidence, we herein describe 14 new species, leading to a more than two-fold increase in the number of known species in this ancient lineage. Additionally, certain taxonomic uncertainties about the status of previously known taxa in this genus are resolved. *Micrixalus narainensis* and *M. swamianus* are considered as junior subjective synonyms of *M. kottigeharensis*, whereas *M. herrei* is resurrected from synonymy of *M. fuscus* and confirmed as a valid species. Taxonomic accounts of three species—*M. elegans*, *M. silvaticus* and *M. thampii*—are provided for the first time after their original descriptions. For nomenclatural stability, *M. fuscus*, *M. saxicola* and *M. silvaticus* are lectotypified, and *M. elegans* and *M. kottigeharensis* are neotypified. Detailed descriptions, morphological and genetic comparisons, illustrations, data on distribution, and natural history are provided for all species. We also provide the first osteological description of *M. fuscus*, the type species of the genus *Micrixalus*, and we report foot-flagging behaviour in a total eight species, including two for which it has been studied previously. Overall, our results highlight the underestimation of true diversity in several amphibian groups of the Western Ghats, suggesting that spatial patterns of amphibian richness and endemism in this region need to be further re-examined.

Keywords: Western Ghats, biodiversity, endemic family, ancient lineage, taxonomy, systematics, foot-flagging, osteology

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