

Taruga, a new tree-frog genus endemic to Sri Lanka

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Using molecular, morphological and life history data, we have identified an endemic lineage of frogs from Sri Lanka, which we have identified as a new genus – *Taruga* (Meegaskumbura et al., 2010).

Previously 15 genera of frogs were recognized from Sri Lanka out of which 3 are endemic. *Taruga* is currently the only genus of endemic frogs among the tree-frogs (Rhacophoridae). Within Rhacophoridae, now there are three genera: *Pseudophilautus*, *Polypedates* and *Taruga*. Curiously, all genera of Sri Lankan endemic frogs are species depauperate and have only 1-4 species contained within them.

We used molecular phylogenetic analyses using six genes (three nuclear and three mitochondrial DNA), morphological analyses of adults and tadpoles and CT scanning of type specimens to analyze osteology in describing *Taruga*.

The best character to distinguish the adults of *Taruga* from *Polypedates* are a set of prominent cone-like projections around the vent. Furthermore, the supratympanic fold of *Taruga* is straighter than those in *Polypedates*. The snout of *Taruga* is very much acute than that of *Polypedates*.

Considering tadpoles, the vent of *Polypedates* forms a tube between left leg and tail, and in *Taruga*, there is no such tube, only an opening between leg and tail. There are also several more features of the mouth cavity, such as the number of projections on the tongue, shape of the tongue etc. that helps to distinguish *Taruga* from *Polypedates*.

Taruga in Sanskrit (and early-Sinhala) means “one who climbs trees”. This name is very appropriate as the adults of these are tree inhabiting frogs, and rarely come to the ground.

Taruga is endemic to Sri Lanka, and we have assigned *T. fastigo* as the type species for this genus. There are two more species currently in this genus (*T. eques* and *T. longinasus*), and we are working on describing a yet one more species for this group. *Taruga eques* is found 1000m asl on Central Hills and Knuckles; *Taruga fastigo* 900m asl in Rakwana mountains (this species has



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the most restricted range); *Taruga longinasus*: below 600m in the wet-zone lowlands of Sri Lanka (this has the largest range).

All three frogs need shade in the form of a canopy to survive, and shallow and slow flowing streams or puddles to breed.

The female of the species builds a foamy nest overhanging water where eggs develop for a few days, after which tadpoles fall into water where they undergo further development until metamorphosis occurs. The juvenile frogs that emerge from water return to an arboreal life, on trees.

Sri Lanka is now known to contain clade level endemism despite many land-bridge connections with India (Bossuyt et al., 2004). *Taruga* is yet another such deeply divergent clade.

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You can download this paper from: <http://web.mac.com/madhavameegaskumbura> or contact first author Madhava Meegaskumbura at madhava_m@mac.com.

Literature Cited

Bossuyt, F., Meegaskumbura, M., Beenaerts, N., Gower, D. J., Pethiyagoda, R., Roelants, K., Mannaert, A., Wilkinson, M., Bahir, M. M., Manamendra-Arachchi, K., Ng, P. K. L., Schneider, C. J., Oommen O. V., and Milinkovitch, M. C. (2004) Local Endemism Within the Western Ghats–Sri Lanka Biodiversity Hotspot, *Science* 306: 479–481.

Meegaskumbura, M., Meegaskumbura, S., Bowatte, G., Manamendra-Arachchi, K., Pethiyagoda, R., Hanken, J. and Schneider C.J. (2010) *Taruga* (Anura: Rhacophoridae), a new genus of foam-nesting tree frogs endemic to Sri Lanka. *Ceylon Journal of Science (Biological Science)*, 39(2): 75–94.

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They often even lay their eggs on trees.