



Research Article

## **HYDROPHYLAX MALABARICUS A NEW DISTRIBUTIONAL RECORD FROM COIMBATORE DISTRICT, TAMIL NADU, INDIA**

**\*<sup>1</sup>Selvaraj Selvamurugan and <sup>2</sup>Santhana Bharathi, N.**

<sup>1</sup>Institute of Forest Genetics and Tree breeding, Coimbatore, Tamil Nadu-642 002

<sup>2</sup>UPASITRF Tea Research Institute, Valparai, Coimbatore, Tamil Nadu

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### **ABSTRACT**

The fungoid frog or Malabar Hills frog (*Hydrophylax malabaricus*) is a colourful frog found on the forest floor and lower vegetation. *H. malabaricus* species recorded from Nirardam, Valparai, Coimbatore district, Tamilnadu state, India. In this study reveals that the Valparai area is rich in amphibian diversity and support many more species. Further studies are needed on population structure, habitat use by amphibians for better understanding and also impose of several biodiversity.

**Keywords:** *Hydrophylax malabaricus*, Valparai, Frog, Malabar Hills.

### **INTRODUCTION**

Amphibians show a very high level of diversity and endemism and are facing a global declines due to the ever-increasing anthropogenic activities from the past few decades (Lawler & Mathias, 2007; Stuart *et al.*, 2004). Among the vertebrates, amphibians are the most threatened species with extinction (IUCN, 2019). At present, India has 437 amphibian species (Frost, 2019), of these 80% are endemic and concentrated in three biodiversity hot spots, namely the Western Ghats, Himalayas and northeast India (part of Indo-Burma hot spot). About 4% of the amphibian species are critically endangered, 2% are near threatened, and others have not yet been assessed by IUCN (Dinesh *et al.*, 2019). As more amphibian species are discovered in the country, with most of them being endemic and range restricted, it is essential to synthesize and understand the amphibian conservation in India. Fitzinger, (1843) raised genus *Hydrophylax* with *Rana malabarica* Tschudi, 1838; as the type species by original designation. However, (Günther, 1864) implied synonymy of *Hydro phylax* to *Rana* Linnaeus, 1758, and (Günther, 1864) implied synonymy of *Hydrophylax* to *Hylorana* (an incorrect spelling of the genus *Hylarana* Tschudi, 1838) by placing the type species under the respective genera. (Boulenger, 1920) considered *Rana malabarica* as member of the

subgenus *Rana*. The genus *Hydro phylax* is diagnosed based on a combination of characters including presence of a postocular mask, robust body, rear of thighs with strong vermiculations, large rectal gland, prominent humeral gland, and ventrolateral grooves sometimes absent on finger (Oliver *et al.*, 2015). Currently recognized species in the genus are widely distributed in Asia and are known from Sri Lanka, India, Bangladesh, southern Myanmar and western Thailand (Frost, 2004; Oliver *et al.*, 2015). They suggested that this widespread species, which is spread across peninsular India, harbors two genetically distinct haplo groups, one restricted to the Western Ghats of Kerala and Tamil Nadu and the other distributed in the Western Ghats of Karnataka, Goa and Maharashtra and extending as far as Madhya Pradesh in central India. While the specimens from Western Ghats of Kerala and Tamil Nadu could be attributed to *Hydrophylax malabaricus sensu stricto* (Dutta *et al.*, 2004).

### **MATERIALS AND METHODS**

#### **Study area**

A dam across Nirar River at a lower site, about 8 km, below the Upper Nirar weir has been constructed. This dam will serve to conduct the diverted waters of Anaimalaiyar

\*Corresponding Author: Mr. Selvaraj Selvamurugan, Institute of Forest Genetics and Tree breeding, Coimbatore, Tamilnadu-642 002 Email: selva199420@yahoo.in

Basin (yet to begin) to the Sholayar valley through the unlined lower Tunnel taking off from the dam site. In addition to this, the yield of the catchment between the Upper Nirar Weir and the Dam will also be diverted to the Sholayar

Basin. In this species based on the identification by photographs. In this locality very rich biodiversity (Figure 3). Photo taken from Nirar dam valparai, Coimbatore district, Tamilnadu state, India.



Figure 1. A view of Nirar Dam, Valparai, Coimbatore district, Tamil Nadu.



Figure 2. A map showing study area of Nirar Dam, Valparai, Coimbatore district, Tamil Nadu.



**Figure 3.** *Hydrophylax malabaricus* species.

### Morphology description

Vomerineteeth in two oval oblique groups between the choanae. Head moderate, depressed; snout moderate, hardly as long as the diameter of the orbit, subacuminate, moderately prominent; loreal region concave; nostril nearer to the end of the snout than to the eye; interorbital space rather narrower than the upper eyelid; tympanum very distinct, nearly as large as the eye. Fingers moderate, first extending beyond second; toes rather short, half webbed: tips of fingers and toes swollen; subarticular tubercles very strong; inner metatarsal tubercle oval, blunt; a large rounded tubercle at the base of the fourth toe; no tarsal fold. The tibio-tarsal articulation reaches the tympanum or the eye. Skin finely granulate above; a broad, not very prominent glandular lateral fold; a strong glandular fold from below the eye to the shoulder, followed by one or two glandules. Head and body bright crimson above, blackish brown on the sides; back sometimes with a few small black spots; upper lip, and a series of spots on the flank, white; limbs blackish brown above, spotted and marbled with pale brown and white; beneath uniform white, or marbled brown and white (source-Wikipedia).

### RESULTS AND DISCUSSION

Although India is one of the major global biodiversity hot spots for amphibians, there is a lack of studies on conservation genetics. Globally, species that are rare, endemic, endangered, or have patchy geographic distribution have often been the target species for studying their genetic diversity so that the estimate can help in ensuring their survival either through translocation or captive breeding to avoid extinction. There is confusion regarding the type series of *Hydrophylax malabaricus*. Original description by Tschudi (1838) does not mention the number of specimens in the type series. However, (Biju *et al.*, 2004) mentioned six specimens as syntypes of *H. malabaricus* originating from Malabar, India and collected by Roux and Dussumier. While examining the type series of *H. malabaricus* we observed that four specimens MNHN

(Biju *et al.*, 2004) designated MNHN 4440 as lectotype of *H. malabarica*. As a result, other three specimens originating from Malabar, namely MNHN 0771, MNHN 1989.3451 and MNHN 1989.3452, are paralectotypes of *H. malabaricus*. In this paper reported, Figure 3. *H. malabaricus* species, Based on the identification of photographs taken from recorded from Nirar dam, valparai, Coimbatore district, Tamilnadu state, India.

*Hydrophylax bahuvistarasp.* Nov. is the fourth species in the recently resurrected genus *Hydrophylax*, which is distributed in Sri Lanka, India, Bangladesh, southern Myanmar, and western Thailand (Frost 2015). While, *H. gracilis* restricted to Sri Lanka, *H. malabaricus* and *H. bahuvistara* are currently known only from India and *H. leptoglossais* known from northeastern states of India, Bangladesh, Myanmar and Thailand. Within India, *H. malabaricus* is distributed in Kerala and Tamil Nadu, *H. bahuvistara* is distributed in Karnataka, Goa, Maharashtra and Madhya Pradesh, while *H. leptoglossais* distributed in Assam, Mizoram, Tripura, and Meghalaya. Type material of the species comes from a wide distribution. however, based on genetic data available in (Kurabayashi *et al.*, 2005; Biju *et al.*, 2004) and (Hasan *et al.*, 2014) and localities for additional material from this study and distributional data for *H. malabarica* Haplo group 1 from (Biju *et al.*, 2004), the species is widespread in peninsular India distributed in Maharashtra, Karnataka, Goa and Madhya Pradesh. However, based on the current study, the populations north of Kerala belong to *H. bahuvistara*, which is a widely distributed species in the peninsular India, while *H. malabaricus* appears to be restricted to the Western Ghats of Kerala and Tamil Nadu. It is therefore essential to reassess the conservation status of *H. malabaricus*.

### CONCLUSION

In India, not a single amphibian genome has been sequenced yet. As genomics can contribute immensely to the conservation of amphibians as well as provide

evolutionary insights, future studies should try to utilize genomic approaches for amphibian management. Given the population density and the ever-increasing anthropogenic pressure on the natural ecosystems in India, it is imperative that along with taxonomic and ecological studies, genetic studies should be carried out to monitor and safeguard the viability of a number of threatened amphibians. Further studies should include conservation genetics, phylogenetics and landscape genetics-based approaches, which can predict threats and risk to the amphibians, thus helping in building strategies for their conservation.

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