

TWO NEW SPECIES OF AMPHIBIA FROM
SILENT VALLEY, S. INDIA

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ABSTRACT

Two new species of Anurans, *Micrixalus thampii* (Ranidae) and *Bufo silentvalleyensis* (Bufonidae) are being described from Silent Valley forests. *M. thampii* comes very close to *M. fuscus*. *B. silentvalleyensis* possesses a parietal ridge and is compared with those Bufonids with parietal ridge viz. *B. parietalis*, *B. fergusonii* and *B. biporcatus*.

Keywords : Silent Valley, *Micrixalus thampii*, *Bufo silentvalleyensis*.

INTRODUCTION

As a member of the multi-disciplinary joint expedition to the Silent Valley organised by the Geological Survey of India in January, 1979 the author was able to make a good collection of Amphibia and while working it out discovered two species new to science belonging to the genera *Micrixalus* and *Bufo* which are being reported here. The Silent Valley, which is in the Palghat District of Kerala State, is one of India's largest, undisturbed evergreen forests spread over 8952 hectares. Kunthi River which is a tributary of Bharathapuzha takes its origin in the valley and flows north-south. There has not been earlier studies on the Amphibian fauna of this forest because of its inaccessible nature and difficult terrain.

Family : RANIDAE

Genus : **Micrixalus** Boulenger

Micrixalus thampii sp. nov.

(Plate IV, A and B)

Diagnosis : Small frogs with tympanum fairly distinct, dorso-lateral glandular folds present but not complete, lingual papilla absent, upper eyelid narrower than inter-orbital space and toes half to three-fourths webbed, with digital discs bearing circum-marginal grooves.

Material : The material consists of two specimens, a male and female collected at a point about 6 kilometre (as the crow flies ; about 15 kilometre on foot) north of the proposed dam site. The female was taken from Madiri Mavam Thodu which is a tributary of the Kunthi River. The male specimen

was collected from a stream which drains into Madiri Mavam Thodu.

DESCRIPTION

Head : Not depressed, as long as broad, width at level of tympanum twice that of the distance from tip of snout to anterior corner of eye. Snout subacuminate, slightly longer than the horizontal diameter of eye ; canthus rostralis blunt and rounded, lores almost vertical, concave between eye and nostril ; nostril at the upper margin of lores, halfway between tip of snout and eye ; inter-orbital space wider than upper eyelid ; tympanum small, its rim fairly distinct through the enveloping skin, its diameter less than half of eye and about half the inter-orbital distance. Pupil horizontal, vomerine absent. Tongue free, bifid, devoid of papilla.

Forelimbs : About half total length, fingers free, tips dilated into discs, that of third twice as wide as the narrowest part of the penultimate phalanx, discs with deep circum-marginal grooves. First finger a little shorter than second, the latter as long as fourth ; subarticular tubercles fairly prominent.

Hindlimbs : More than $1\frac{1}{2}$ times the length from tip of snout to coccyx, heels hardly touching when limbs are folded at right angles to body ; tibio-tarsal articulation of the adpressed limb reaching just beyond anterior corner of eye. Tibia about half of total length, about 4 times as long as broad. Disc of toes larger than that of fingers, with deep circum-marginal pocket-like grooves. No intercalary ossicle present, Toes in males three-fourths webbed, only narrow fringes of web reaching discs on the outer side of first, second, third and the inner side of fifth toe. Three digits of fourth toe free. The webbing

comparatively briefer (half) in females where two distal digits of first, second, third, fifth, and a little more than three digits in the fourth toe are free. Subarticular tubercles prominent ; a small oval inner metatarsal tubercle present, no outer tubercle. Outer metatarsal separated by web in the distal half. No outer metatarsal fold or tubercles. No tarsal fold.

Skin : Smooth above with few small granules which are devoid of minute spines. Dorsal side of tibia with larger granules. An incomplete weak dorsolateral glandular fold originating at shoulder level upto groin. Tympanic fold faint. A row of three pustules from angle of mouth to insertion of arm.

Colour : Dorsum greyish brown without much markings. Flank below the dorsolateral fold black which encloses the darkish tympanum. Sides of snout darker on the upper half. Upper sides of femur and tibia with narrow brown cross bands. Hind surface of thigh black with a narrow whitish oblique line from base to half or less its length. Under surface of body white, mottled and marbled with brown on breast and more so on throat. Under side of thighs white while that of calf brownish with a distinctive clear, white band running its entire length.

Secondary sex characters : Dorsum in male darker with indistinct markings. Vocal sacs internal opening to the floor of mouth by paired openings near the angle of jaws. Nuptial pads present on the upper side of first finger extending from wrist to base of penultimate digit. Webbing on toes in male more extensive in comparison with female. Male smaller.

Measurements : See Table I

TABLE 1. Body measurements in mm. of *Micrixalus thampii* Pillai

		Male	Female
Total length	...	20.0	29.0
Length of head (tip of snout to angle of jaws)	...	7.5	8.0
Width of head (at angle of jaws)	...	7.0	8.0
Length of Snout (tip of snout to anterior corner of eye)	...	3.5	4.0
Diameter of eye	...	3.0	3.0
Width of upper eyelid	...	1.8	2.0
Minimum inter-orbital distance	...	2.2	2.5
Diameter of tympanum	...	1.0	1.2
Length of forelimb	...	10.5	11.0
Length of hind limb	...	34	40
Length of tibia	...	11.0	13.0
Width of tibia	...	3.0	3.5

Type-specimens :

Holotype : An adult ♂ frog, loc. Silent Valley, S. India, Alt. 900 metres. 27 January 1979, Coll. R. S. Pillai.

Paratype : An adult ♀ frog, loc. Silent Valley, 26 January 1979. Other data same as above.

The Type specimens are deposited with the Southern Regional Station, Zoological Survey of India, Madras.

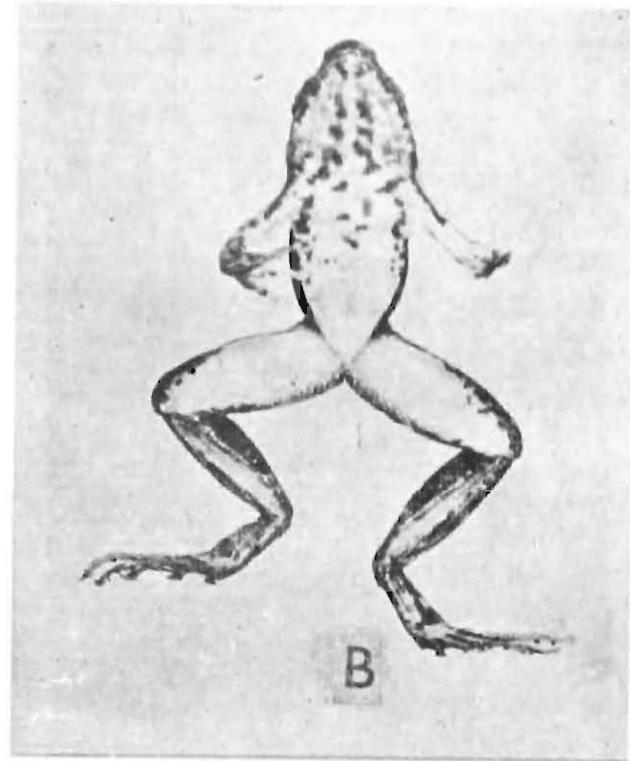
Both the specimens were taken from water. The long legs and webbed feet suggest that they are good swimmers and leapers.

It is a pleasure to name this frog after Shri P. K. Thampi who led the expedition to the Silent Valley.

AFFINITIES

Pillai (1978) while describing *Micrixalus nudis* from Wynad has presented a key to the seven Indian and the single Ceylonese species of *Micrixalus*. Running down the Key with reference to the characters enumer-

ated above, the present species is seen to occupy a position very close to *Micrixalus fuscus* (Boulenger, 1890). But a comparison with the material of *M. fuscus* which the author collected from Courtallam (S. India) shows that the present species is quite distinct. *M. fuscus* has a long, pointed snout, inter-orbital space only as broad as upper eyelid, toes nearly entirely webbed and the stripe on the hindside of thigh is horizontal, broad and extending to the articulation of the femur and tibia. *M. thampii* comes close but differs from *M. herrei* erected by Myers (1942) on the basis of a single male specimen collected from Kallar (near Trivandrum, Kerala), the female of which is still unknown, in the incomplete and weak dorso-lateral and tympanic folds, inter-orbital space being broader than upper eyelid, the tibio-tarsal articulation not extending beyond tip of snout, in the shorter webbing on toes, the discs on toes being larger than those on fingers, the outer metatarsal being separated in the distal half (as against one-third or one-



A and B. Dorsal and ventral views of *Micrixalus thampii* Pillai (♀)
C and D. Dorsal and ventral views of *Bufo silentvalleyensis* Pillai

fourth in *M. herrei*) and in colouration, particularly back of thighs and lower side of tibia. The present species resembles *M. silvaticus* (Boul.) in the incomplete dorso-lateral folds but could easily be distinguished by the more extensive webbing on toes, larger digital discs, longer legs and colouration. *M. thampii* also differs from *M. saxicola* (Jerdon), *M. sarasinorum* (Muller), *M. nudis* (Pillai) and *M. borealis* Annandale in the presence of dorsolateral glandular folds and from *M. opisthorhodus* (Gunther) in the absence of a lingual papilla.

Family : BUFONIDAE

Genus : **Bufo** Laurenti

Bufo silentvalleyensis sp. nov.

(Plate IV, C and D)

Diagnosis : A fairly large toad with smooth skin, broad head and slender limbs. Cranial ridges present, the parietal ridge being directed obliquely inwards.

DESCRIPTION

Head : Broader than long, with bony cranial ridges in the form of a canthal, pre-orbital, supra-orbital, post-orbital, parietal and supra-tympanic. Ridges on either side elevated rendering the inter-orbital area depressed and excavated. Parietal ridges directed obliquely inwards making an obtuse angle with the supra-orbital. Snout rather blunt not projecting beyond lower jaw. Canthus rostralis prominent, loreal region almost vertical, nostrils, lateral, near the tip of snout, distance between them less than minimum inter-orbital distance and slightly more than diameter of tympanum. Eyes with pupil horizontal, its diameter equal to minimum inter-ocular distance. Upper eyelid broad, oval, overhanging and about closing the

corneal surface. Tympanum distinct, smooth, about half diameter of eye. Upper jaw devoid of teeth, vomerines absent, tongue small, pyriform.

Forelimbs : Slender, about three-fourths length from tip of snout to vent. Fingers free, tips obtuse. First finger a little longer than second, third much longer. Inter-articular tubercles prominent, two pads on palm.

Hindlimbs : Long, slender, about $1\frac{1}{2}$ times length of head and body. Tibia very thin being 5 times as long as broad and as long as foot. Tibia-tarsal articulation of adpressed limb reaching anterior margin of tympanum, heels not touching when limbs are folded at right angles to body. Toes long, tips obtuse, webbed at base. Outer metatarsal fused for more than half its length, Subarticular tubercles small.

Skin : Dorsal surface smooth, a few tubercles behind the angle of jaws, limbs with minute tubercles. A few tubercles on flanks. Parotoids prominent, narrow and smooth. A distinct hump above cloaca representing the tip of coccyx. Diapophysis of sacral vertebrae dilated and projecting. Skin of ventral parts rough.

Colour : (In spirit) Dorsum uniformly greyish brown, flanks and upper side of limbs darker, devoid of markings. Cranial crests lighter. Throat light brown, chest faintly marbled, belly white with brownish blotches, underside of thighs white.

Measurements : See Table 2

Holotype : An adult frog, loc. near Valiaparai Thodu, Silent Valley Forests, S. India, Alt. 800 metres. 17 January 1979, Coll. R. S. Pillai,

TABLE 2. Body measurements in mm. of *Bufo silentvalleyensis* Pillai

Total length	...	66.0
Length of head (tip of snout to angle of jaws)	...	21.0
Width of head (at angle of jaws)	...	27.0
Length of snout (tip of snout to anterior corner of eye)	...	9.0
Diameter of eye	...	8.8
Width of upper eyelid	...	5.0
Minimum inter-orbital distance	...	8.5
Diameter of tympanum	...	9.7
Length of forelimb	...	46.0
Length of hindlimb	...	90.0
Length of tibia	...	30.0
Width of tibia	...	6.0

The single specimen was collected from under a stone in a grassy plot of open forest adjoining the Valiaparai stream which is a tributary of Kunthi River. No information about the habits of this species is available. The weak legs and little webbing suggest that adults are terrestrial living in forest litter.

AFFINITIES

Toothless jaws, pyriform tongue, parotoids and free fingers indicate that the present specimen belongs to genus *Bufo*. Presence of a parietal ridge on the head brings it close to *Bufo parietalis* Boul., *Bufo fergusonii* Boul. and *Bufo biporcatus* Gravenh. The two former species are known from hills of S. India while *B. biporcatus* is distributed in Java, Borneo and Burma. That *B. silentvalleyensis* is not conspecific with any of these three and requires the erection of a new taxon to accommodate it is evident from the following. A comparison with several examples of *Bufo parietalis* which were collected from Silent Valley forests show that the present example is quite distinct from it. The robust body, stout limbs, profusely warty skin and the very prominent and cornified cranial ridges

are quite unmistakable. *B. fergusonii* is a much smaller species with stout body and limbs, skin beset with spinose tubercles, rounded parotoids and the first finger equal to second. In *B. biporcatus* the parietal ridge forms a straight line together with the supra-orbital ridge while it forms an angle in *B. silentvalleyensis*. The larger tympanum (equal to eye), smaller first finger, more extensive webbing, spinous tubercles on dorsum are all characters which easily distinguish *B. biporcatus* from *B. silentvalleyensis*.

The body profile and slender limbs do not conform to that in *Bufo*, but is strongly reminiscent of that of the Pelobatid genus *Leptobrachium* to which it was thought to belong at the time of its collection. But the toothless upper jaw, horizontal pupil, distinct tympanum, parotoid glands and the cranial ridges are unmistakable characters of the genus *Bufo*.

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REFERENCES

- BOULENGER, G. A. 1882. Catalogue of the *Batrachia Salientia s. Ecaudata* in the Collection of the British Museum. London, British Museum, 503 p.
- BOULENGER, G. A. 1890. *The Fauna of British India including Ceylon and Burma: Reptilia and Batrachia*. London, Taylor and Francis. 541 p.
- BOULENGER, G. A. 1892. Description of a new toad from Travancore (*Bufo fergusonii*) *J. Bombay nat. Hist. Soc.*, 7 : 317.
- MYERS, G. S. 1942. A new frog of the genus *Micrixalus* from Travancore. *Proc. Biol. Soc. Wash.*, 55 : 71-74.
- PILLAI, R. S. 1978. A new frog of the genus *Micrixalus* Boul. from Wynad, S. India. *Proc. Indian Acad. Sci.*, 87 : 173-177.
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