

**AMPHIBIANS FROM SABARIGIRI FOREST, WESTERN GHATS,  
KERALA, INCLUDING A NEW SPECIES OF *MICRIXALUS***

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**INTRODUCTION**

The Amphibia reported in this paper were collected during the course of two field survey trips to Sabarigiri with the primary objective of comparing its faunal wealth with that of Silent Valley where faunal studies were made to assess the possible impacts of the proposed hydel project. The first one was from 23.4.1981 to 10.5.1981. The second survey was from 7th to 12th December 1981 when the senior author accompanied Dr. Madhav Gadgil and other scientists who were deputed to assess the extent of well preserved natural vegetation in the Peermede plateau. Some material of Amphibia was collected during the overnight trek from Pamba Reservoir to Thannikudy in the Periyar Tiger Reserve.

In all 265 examples of Amphibia belonging to 4 families, 7 genera and 14 species were collected out of which one species of *Micrixalus* turned out to belong to a new taxon. This is being named in honour of Dr. Gadgil.

No systematic account is available in literature on the Amphibia of Sabarigiri where a hydel project has been commissioned about one and a half decades ago. Neither has any serious study been undertaken to assess the impact of the hydel project on this forest ecosystem.

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**LIST OF AMPHIBIANS FROM SABARIGIRI**

The following orders, families, genera and species are represented in the material studied.

Class	AMPHIBIA
Order	SALIENTIA
Family	RANIDÆ
Genus	(1) <i>Rana</i> Linnaeus

1. *Rana limnocharis* Boie
2. *Rana keralensis* Dubois

3. *Rana beddomii* Gunther
4. *Rana diplosticta* (Gunther)
5. *Rana temporalis* Gunther
6. *Rana curtipes* Jerdon

Genus (2) *Micrixalus* Boulenger

7. *Micrixalus fuscus* Boulenger
8. *Micrixalus gadgili* sp. nov.

Genus (3) *Nyctibatrachus* Boulenger

9. *Nyctibatrachus major* Boulenger

Genus (4) *Nannobatrachus* Boulenger

10. *Nannobatrachus beddomii* Boulenger

Family BUFONIDAE

Genus (5) *Bufo* Laurenti

11. *Bufo melanostictus* Schneider
12. *Bufo parietalis* Boulenger

Family RHACOPHORIDAE

Genus (6) *Philautus* Gistel

13. *Philautus nasutus* (Gunther)

Order GYMNOPTIONA

Family ICHTHYOPHIDAE

Genus (7) *Ichthyophis* Fitzinger

14. *Ichthyophis tricolor* Annandale

### SYSTEMATIC ACCOUNT

#### 1. *Rana limnocharis* Boie 1835

1920. *Rana limnocharis*: Boulenger, *Rec. Indian Mus*:28

1923. *Rana limnocharis*: V. Kampen, *Amph. Indo-Austr. Arch*:167

Twenty five specimens ranging from 12 mm to 36 mm in head and body, collected from five localities in and around Pamba are available.

Although agreeing with the description of this species, the following notes are offered. Tibio-tarsal articulation exceeds eye and in some almost touches tip of snout. Tibia is as long as or slightly shorter than foot. In one-third of the examples, dorsum presents three reddish spots. Coupled with the small size of the specimens it is

tempting to include them under the variety *syhadrensis* proposed by Annandale (1919) to those individuals from comparatively high altitudes of the Himalaya, Burma and Western Ghats. However, no differences with reference to dorsal warts or webbing or in the comparative lengths of the first and second fingers are discernible.

### 2. *Rana keralensis* Dubois 1980

1920. *Rana verrucosa*: Boulenger, *Rec. Indian Mus*: 26.

A total of 72 juveniles and adults collected from five localities at Moozhia are available. The largest of these measure 65 mm from vent to snout. However, most of them fall under the 15-25 mm range.

They seem to prefer rainwater or other stagnant pools in grassy areas. Some were taken from grassy banks of streams.

### 3. *Rana beddomii* Gunther 1875

1920. *Rana beddomii*: Boulenger, *Rec. Indian Mus*: 114.

Seven localities both from Pamba and Moozhia have yielded 20 adults and 2 juveniles. The largest example measures 33 mm in head and body; the smallest is 21 mm. In characters and colouration they agree well with published accounts. Some males exhibit well developed nuptial pads on the first finger.

### 4. *Rana diplosticta* (Gunther 1875)

1882. *Rana diplosticta* : Boulenger, *Cat. Batr. Sal. Brit. Mus* : 58.

1920. *Rana diplosticta* : Boulenger, *Rec. Indian Mus*: 120.

To this species we assign a single stout example measuring 27 mm in head and body. The tympanum is only moderately distinct. The characteristic black spot above the loins is very clear.

Dorsum greyish, snout not lighter. A broad temporal streak extending forwards as canthal streak right upto the tip of snout. Base of arms with a clear, long black stripe. Limbs barred, lower side of foot darker. Belly and lower parts of limbs white.

### 5. *Rana temporalis* Gunther 1864

1920. *Rana temporalis*: Boulenger, *Rec. Indian Mus*: 159.

64 adults and five juveniles belonging to this species were collected from eight localities from both Pamba and Moozhia. They were more common along the banks of rocky streams in Pamba. Although the largest example measures 80 mm in head and body, about half of them belongs to 12 to 25 mm range.

Yellowish brown above with small dark or grey spots in between the dorso-lateral glandular folds. Ventrally white, throat and chest mottled with brown.

### 6. *Rana curtipes* Jerdon 1853

1920. *Rana curtipes*: Boulenger, *Rec. Indian Mus*: 131.

A single example of this frog was taken during the trek from Pamba to Thannikudy on 11.12.1981 from a spot about 8 km from Pamba. Measuring 59 mm from tip of snout to vent, it agrees well with the descriptions in literature. An outer metatarsal tubercle, however, is present for this species although Boulenger (1920) states that it is absent.

### 7. *Micrixalus fuscus* (Boul. 1882)

1882. *Ixalus fuscus*: Boulenger, *Cat. Batr. Sal. Brit. Mus*: 96.

1890. *Micrixalus fuscus*: Boulenger, *Fauna Brit. India* 466.

Thirty adults, six juveniles and a few tadpoles were collected from 11 localities both from Pamba and Moozhiar, the size ranging from 12 to 28 mm. The tail, in tadpoles is 1½ times longer than body.

### 8. *Micrixalus gadgili* sp. nov.

**Material** : The material consists totally of six examples, two from Pamba and four from Moozhiar forests of Sabarigiri. One of them is a male.

**Diagnosis** : Small frogs with tympanum fairly distinct, dorsolateral glandular folds and lingual papilla absent, digits with small discs bearing circum-marginal groove, feet sparsely webbed and both inner and outer metatarsal tubercles present.

**Description** : *Head*: Not depressed, about as broad as long, width at angle of jaws equal to distance to tip of snout. Snout subacuminate, as long as diameter of eye, protruding beyond mouth. Canthus rostralis rounded, lores almost vertical, slightly concave, nostril lateral, half way between eye and tip of snout. Interorbital space half times broader than upper eyelid. Tympanum small, its rim fairly distinct through the enveloping skin, its diameter half that of eye. Pupil horizontally oval; vomerines absent, tongue free, bifid, devoid of papilla.

**Forelimbs** : Short, moderately slender and about half the total length from tip of snout to vent. Fingers free, tips dilated into small discs with circular groove. First finger a little shorter than second which is as long as fourth. Subarticular tubercles prominent.

**Hindlimbs** : About 1½ times the total length from tip of snout to vent; heels not touching when limbs are folded at right angles to the body; tibio-tarsal articulation of adpressed limb reaching mid-eye. Tibia half of body length, about 3½ to 4 times as long as broad, toes with discs larger than that of fingers, with circum-marginal grooves. Web rudimentary, not extending beyond basal phalanges and without fringes extending to discs. No intercalary ossicles, subarticular tubercles fairly prominent. An elongated inner metatarsal tubercle and a much smaller nodule-like outer metatarsal tubercle present.

**Skin** : Shagreened above, with a few scattered granules on flank. Dorsolateral glandular folds absent, a weak supratympanic fold.

**Colour** : Dorsum light greyish to dark with irregular darker markings, occasionally spotted or marbled with lighter hue. A dark band on either side backwards from eye tapering to groin. Originating above this is a short longitudinal band terminating sharply at about the middle of the body. Arms and legs with darker patches and bars dorsally. Throat and breast marbled with sepia in four examples while it is mottled or immaculate in the other two.

The smallest example (15 mm) collected on 6.5.1981 from Moozhier is a male with nuptial pads on the upper side of first finger. This specimen is palest of the lot.

**Measurements** See Table

**Holotype** : An adult female, loc. Dynamite House, Pamba, Sabarigiri, S. India, Alt. 990 metres, coll. R.S. Pillai, 29 April, 1981.

**Paratypes** : 1) One male, loc. 3 km by road to Moozhier from I.B., Sabarigiri, S. India, Alt. 440 metres, coll. R.S. Pillai, 6 May, 1981 2) Three adult females, loc. Vettayar. Sabarigiri, Alt. 520 metres, coll. R.S. Pillai, 9 May, 1981. 3) One adult female, loc. western side of (Eighteen five), Pamba, Sabarigiri, S. India, Alt. 1100 metres, coll. R.S. Pillai, 3 May, 1981.

**Field notes** : All the specimens were collected from damp litter of the forest floor. They resembled *Microhyla ornata* (Dum. & Bibr.) in their movements and tried to take shelter under decaying leaves to avoid detection. Although many other species of Amphibia were collected from streams nearby, not a single example of *Micrixalus gadgili* was picked up from water. Their rudimentary webs not being of much use in water, the species appears to be terrestrial in habit.

**Affinities** : A comparison with eight species of Indian and Ceylonese frogs of the genus *Micrixalus*, a key for which was presented by Pillai (1978) and with *Micrixalus thampii* described subsequently by Pillai (1981) from Silent Valley, Kerala, shows that the present species is closely related to *Micrixalus nudis* Pillai known from Wynad, S. India. However, the erection of a new taxon to accommodate the present species has been necessitated in consideration of some stable differences, the most important of which are the much briefer webbing on toes and presence of a distinct outer metatarsal tubercle. A better defined tympanum, a much thinner tibia and colour pattern are the other characters which distinguish *Micrixalus gadgili* from *Micrixalus nudis*. While the presence of a lingual papilla distinguishes *M. saxicola* (Jerdon) and *M. sarasinorum* (Muller) from the present species, the absence of dorsolateral glandular folds in *M. gadgili* separates it from the rest of the Indian species viz. *M. opisthorhodus* (Gunther), *M. herrei* Myers, *M. fuscus* (Boul.) *M. sylvaticus* (Boul.) *M. borealis* Annandale and *M. thampii* Pillai.

TABLE I

Body measurements in mm of *Micrixalus gadgili* Pillai & Pattabiraman

Body parts	Holotype	Paratypes				
		1	2	3	4	5
1. Total length (from tip of snout vent)	19	19	19	18.8	19.2	15
2. Length of head (from tip of snout to angle of jaws)	6	6	6.2	5.9	6	5
3. Width head (at angle of jaw)	6	6	6.2	5.9	6	5
4. Length of snout (from tip of snout to anterior corner of eye)	2.6	2.6	2.6	2.6	2.7	2.4
5. Diameter of eye	2.5	2.5	2.5	2.5	2.5	2.3
6. Minimum inter-orbital distance	2.1	2.1	2.1	2.1	2.2	1.8
7. Maximum diameter of tympanum	1.2	1.2	1.3	1.3	1.2	1.1
8. Length of forelimb (upto tip of finger)	12	12	11.5	11.5	12	9.5
9. Length of hindlimb	29.5	29.5	30	29.3	31	24
10. Length of Tibia	9.5	9.5	9.5	9.2	9.8	7.5
11. Width of tibia (Maximum)	2.5	2.8	2.9	2.7	2.5	2.0

### 9. *Nyctibatrachus major* Boul. 1882

1890. *Nyctibatrachus major*: Boulenger, *Fauna Brit. India* : 468.

1978. *Nyctibatrachus major*: Pillai, *Bull. zool. Surv. Inaia* 135.

Thirty adults and two tailed juveniles have been collected from seven localities mostly from understones in stream beds or from muddy debris in shallow side pools. They agree well with the descriptions of the species available in literature.

### 10. *Nannobatrachus beddomii* Boul. 1882

1882. *Nannobatrachus beddomii*: Boulenger, *Cat. Batr. Sal. Brit. Mus*: 470.

A single example of this rare frog was collected at a point 12 km from Pamba I.B. towards Thannikudy on 11.12.1981. It measures 15.2 mm from tip of snout to vent.

Pupil rhomboidal although Boulenger (1882) has indicated the vertical condition of the pupil as a generic character to distinguish it from *Nannophrys* which has horizontal pupil. The non-utility of this character has already been pointed out by Rao (1937). Habit stout, head depressed, with indistinct canthus rostralis. Inter-orbital space in our example is broader than upper eyelid. Toes with slight rudiment of web, skin smooth above. Dorsum light brown, variegated with darker colour. An ill-defined lighter band on either side of body and a dark stripe connecting the two eyes. Limbs cross barred. Ventrally whitish.

*Nannobatrachus beddomii* is a very rare frog endemic to Western Ghats. Subsequent to its description by Boulenger in 1882, Sabarigiri is the second place from where we have collected this species, the first being Silent Valley. Boulenger's material came from Malabar and Tinnevely hills.

#### 11. *Bufo melanostictus* Schneider 1799

1890. *Bufo melanostictus*: Boulenger, *Fauna Brit. India* 505.

1963. *Bufo melanostictus*: Daniel, *J. Bombay nat. Hist. Soc.* 435.

Two examples measuring 41 mm and 47 mm were collected from the forest floor, one from decaying timber.

#### 12. *Bufo parietalis* Boulenger 1882

1890. *Bufo parietalis*: Boulenger, *Fauna Brit. India* 507.

Two examples measuring 60 mm and 70 mm were collected. The first one was seen resting well exposed on a large boulder by the side of a stream. Lemon-colored and totally inactive, it was collected easily. The bright yellow dorsum had a few brown spots mid-dorsally. Flanks brownish and ventrally white with a few dark dots.

#### 13. *Philautus nasutus* (Gunther 1868)

1882. *Ixalus nasutus*: Boulenger, *Cat. Batr. Sal. Brit. Mus.* 100.

1957. *Philautus nasutus*: Kirtisinghe, *Amph. Ceylon*: 73.

A single example measuring 25 mm in total length was collected from within a fallen, decaying stem along with a specimen of *Bufo melanostictus* near the Kakki dam.

Brownish with a raised median vertebral glandular line from tip of snout to vent. The tibio-tarsal articulation in our example reaches only upto the middle of eye. Being a male, the first finger has a basal pad. Throat speckled with brown. This species is known from Southern India and Ceylon.

#### 14. *Ichthyophis tricolor* Annandale 1909

1909. *Ichthyophis glutinosus tricolor*: Annandale, *Rec. Indian Mus.* 286.

1968. *Ichthyophis tricolor*: Taylor, *Caecilians of the World*: 148.

A single example of *Ichthyophis tricolor* measuring 170 mm in length was collected on 9.5.1981 from Vettayar (Moozhiar) at an altitude of 520 metres. The first nuchal groove crosses the throat and passes up on the head but does not reach the mid-dorsal line. The second nuchal groove passing on the side of the neck stops at mouth level. The third groove is clear below but indistinct dorsally. There are about 265 annuli behind these.

Slaty brown with a narrow yellowish lateral stripe from head to tip of tail. A narrow dark stripe borders the lower part of this yellow stripe; a broad whitish ventral stripe.

The specimen was collected from under a rotting piece of wood, far away from the stream.

### SUMMARY

The paper deals with the Amphibia of Sabarigiri forest (Western Ghats, Kerala) based on two surveys. 14 species belonging to 4 families and 7 genera are recorded out of which one species, viz. *Micrixalus gadgili* is described as new to science. A single example of the rare frog, *Nannobatrachus beddomii*, originally described by Boulenger in 1882 has been recorded.

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