

AMPHIBIAN FAUNA OF SILENT VALLEY, KERALA, S. INDIA

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(With 3 Text-figures)

INTRODUCTION

The richest expression in diversity and abundance of the Indian Amphibia is met with in the Western Ghats as evidenced by the earlier works of Boulenger (1882, 1890, 1920), Daniel (1963 a, b; 1975) etc. There have been a few additions to its faunal wealth in more recent years (Pillai, 1978, a, b; 1979). However, the large tract of evergreen forest constituting Silent Valley remained practically unknown with regard to its Amphibian fauna.

The present work tries to fill this lacuna and incorporates the results of the study of Amphibia collections made in Silent Valley in January-February 1979, January-February 1980, April-May 1980, and November-December 1980. All data on details of collections etc. have not been included here as is customary in a taxonomic paper of this kind because it would be too voluminous. However, all the relevant details are given at the appropriate places.

19 species are being reported here which includes one Caecilian new to science. These however, represent only a fraction of the amphibian wealth of Silent Valley. There are several localities in the Valley yet to be surveyed and future surveys shall undoubtedly reveal many more species.

The colour given for the species is mostly that in the preserved state unless otherwise Stated. All specimens were collected by the author except those few which are indicated at the appropriate places. Reference which give descriptions are cited under each species.

LIST OF SPECIES OF AMPHIBIA FROM SILENT VALLEY

Class : AMPHIBIA

Order : GYMNOPIIONA

Family : ICHTHYOPHIDAE

Genus (1) *Ichthyophis* Fitzinger

1. *Ichthyophis longicephalus* sp. nov.

Order : ANURA

Family : BUFONIDAE

Genus (2) *Ansonia* Stoliczka

2. *Ansonia rubigina* Pillai and Pattabiraman

Genus (3) *Bufo* Laurenti

3. *Bufo parietalis* Boulenger
4. *Bufo microtympanum* Boulenger
5. *Bufo silentvalleyensis* Pillai

Genus (4) *Nectophryne* Buchholz and Peters.

6. *Pedostibes tuberculosus* (Gunther)

Family : MICROHYLIDAE

Genus (5) *Ramanella* Rao & Ramanna.

7. *Ramanella triangularis* (Gunther)

Family : RANIDAE

Genus (6) *Micrixalus* Boulenger

8. *Micrixalus nudis* Pillai
9. *Micrixalus thampii* Pillai
10. *Micrixalus saxicola* (Jerdon)

Genus (7) *Nannobatrachus* Boulenger

11. *Nannobatrachus beddomii* Boulenger

Genus (8) *Nyctibatrachus* Boulenger

12. *Nyctibatrachus major* Boulenger

Genus (9) *Rana* Linnaeus

13. *Rana limnocharis* Wiegmann
14. *Rana beddomii* (Gunther)
15. *Rana temporalis* (Gunther)

Family : RHACOPHORIDAE

Genus (10) *Rhacophorus* Kuhl.

16. *Rhacophorus malabaricus* Jerdon

Genus (11) *Philautus* Gistel

17. *Philautus variabilis* (Gunther)
18. *Philautus signatus* Boulenger
19. *Philautus pulcher* Boulenger

SYSTEMATIC ACCOUNT

1. *Ichthyophis longicephalus* sp. nov.

Figs. 1-3

Diagnosis : A small species, 192 mm in length. Head comparatively longer. Distinct lateral yellow stripe from tip of tail to posterior margin of second nuchal collar. An indistinct patch on the lateral side of each collar and one on the angle of jaw. 348 primary and secondary annuli, 8 of which on tail. Tentacles much closer to eye than to nostril.

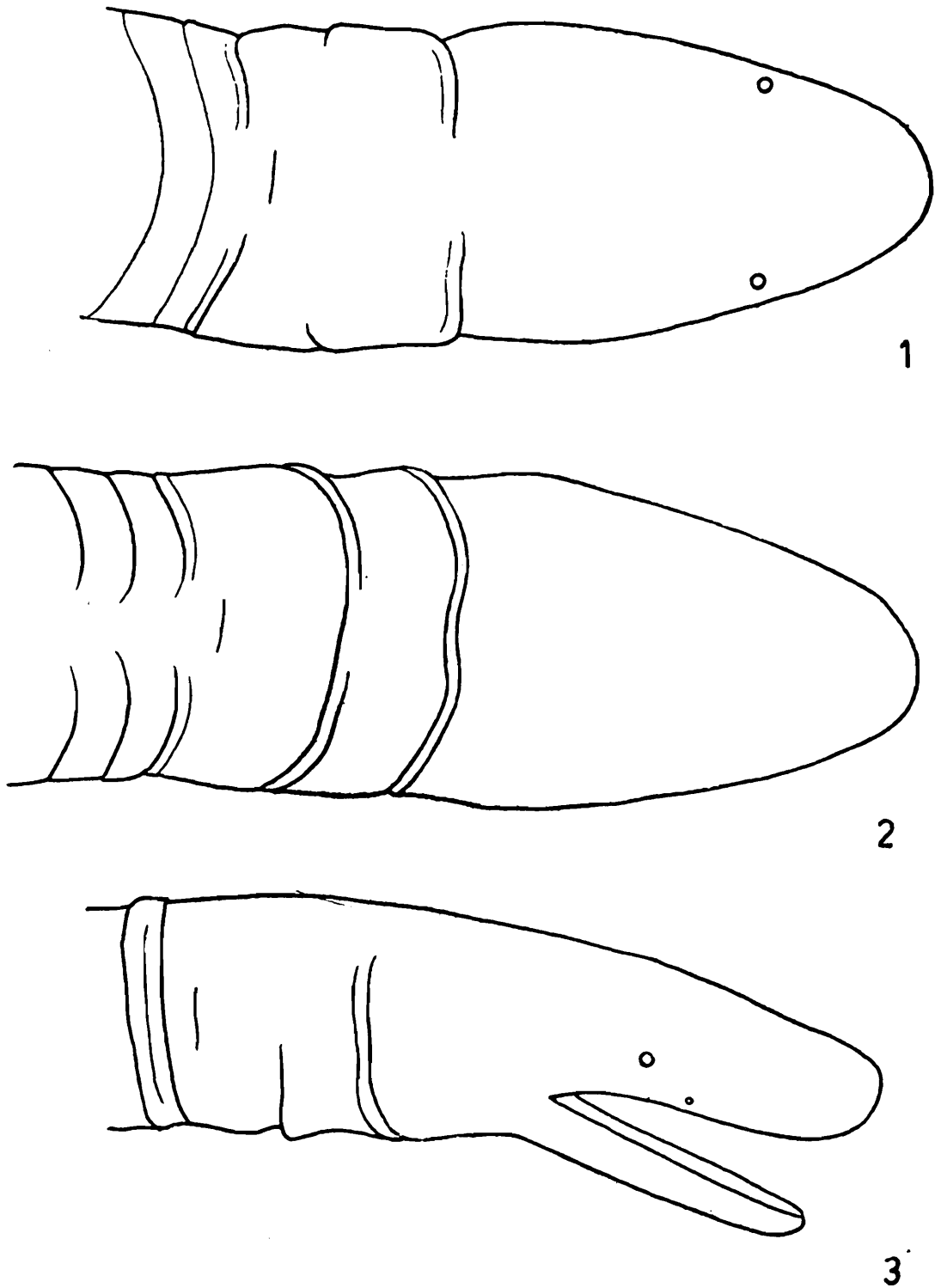
Description : Body short, fairly broad, its width (maximum) in length about 23 times; head comparatively long (16 times in total length), blunt, narrower than body; eyes distinct, distance between them more than length of snout (from level of eye to tip of snout); tentacular aperture at the margin of the upper lip and much closer to eye than to nostril, its distance from eye less than half its distance from nostril. Eye well developed, in a socket, closer to tip of snout than to the first nuchal groove. Nostrils nearly terminal, not very close to each other, visible from above ; snout extends a little beyond mouth.

Head followed by two nuchal collars, the first strongly outlined on ventral side by the anterior nuchal groove which is clear laterally and fairly so dorsally. The first collar is completely fused with the second dorsally ; the second groove is pronounced on the ventral side and abruptly terminates laterally at the level of angle of mouth. The second collar is delimited posteriorly by a very weak groove which is practically indistinguishable ventrally, dimly visible laterally and less so dorsally. Second collar bears one or two incomplete folds dorsally.

There are 348 primary and secondary annuli following the collars dorsally, the ventral count being 350. The annuli tend to cross the dorsal side rather sinuously while on the venter they are curved backwards at an angle but do not meet in the midventral line which gives the impression of a mid-ventral longitudinal line extending from behind collar to the proximity of vent. 8 annuli

on tail of which 3 or 4 are interrupted by vent. Tail short, terminating in a bluntly pointed tip, its length in total length approximately 43 times.

A single row of scale below the skin on the anterior part of the body. Two or three rows seen on the more posterior annuli.



Ichthyophis longicephalus sp. nov.

Fig. 1 Dorsal view Fig. 2 Ventral view Fig. 3 Lateral view

Four series of teeth present as follows : premaxillary-maxillary, 17-18; prevomeropalatine, 14-14; dentary, 16-16; splenial, 16-14. Premaxillary-maxillary and dentary teeth about the same size, splenials smallest of all.

Tongue narrow, anteriorly striated and covers the splenials almost fully. Choanae narrow, long, interchoanal distance about 8 times that of transverse distance of one

Dark violet brown above, without lighter bands along annuli. Distinct yellow stripe along side of body from tip of tail to posterior margin of second nuchal collar. An indistinct patch on either side of second collar and a distinct band on lateral aspect of first collar. This band is not connected to another patch on the angle of jaw. Venter somewhat lighter than dorsum, each annulus demarkated by a narrow pale band which is broken in the middle resulting in a longitudinal midventral line from collar to near the vent. A whitish spot surrounding the vent, connected to the lateral stripes by two bands on either side.

Measurements

Total length	.. ...	.....	192 mm
Tail length	.....	.....	4.5 mm
Head width	.....	.....	7.5 mm
Body width (Maximum)	..	.....	8.5 mm
Eye to tentacle		.....	1.4 mm
Tentacle to nostril		.....	3.1 mm
Eye to eye		.....	5.1 mm
Eye to tip of snout		.....	4.5 mm
Snout tip to first groove		.....	12 mm
Snout tip to second groove		.....	14.7 mm

Material : A total of 40 specimens were collected from smaller tributaries and streamlets joining Kunthi River. However all these turned out to be juveniles and larvae (possessing a caudal fin) except one example collected on 27.1.1979 on which the present description is based. Eight specimens are on the verge of becoming adults but still possess tail fin. *Holotype*. An adult, 192 mm in total length, loc, Silent Valley, Kerala, S. India, alt. 1050 metres, coll. R. S. Pillai, 27 Jan. 1979. Type presently deposited with the Southern Regional Station, Zoological Survey of India, Madras 28. The specimen was collected

from wet, slushy ground close to a brook flowing through thick forest. A number of larvae were collected from the brook.

Remarks : All striped forms of *Ichthyophis* which were earlier regarded as *I. glutinosus* have been split up into different species (Taylor, 1961). Taylor (1968) regards the proper *I. glutinosus* (Linn.) as confined to Sri Lanka.

Only three striped forms inhabit India. These are *I. beddomei* Peters, *I. tricolor* Annandale and *I. minor* Pillai (In press), all of which are quite distinct from *I. longicephalus* sp. nov. However, it is closely related to *I. glutinosus* from which it could easily be distinguished by the much longer head (16 times in total length in comparison with about 25 times in *glutinosus*, 20 to 23 times in *tricolor* and 23 to 26 times in *beddomei*).

2. *Ansonia rubigina* Pillai and Pattabiraman.

1981. *Ansonia rubigina* Pillai and Pattabiraman. *Proc. Indian Acad. Sci.*, 90, 203.

Two examples of this torrent toad were collected from Kummattan Thodu, a tributary of Kunthi River on 2nd May, 1980.

3. *Bufo parietalis* Boulenger

1882. *Bufo parietalis* Boulenger, *Cat. Batr. Sal. Brit. Mus.* : 312.

19 males and females are available, all of them collected from the banks of Kunthi River in January-February, 1979 and April, 1980. The largest female measures 95 mm in head and body.

Cranial ridges black, cornified. Canthal, supraorbital and parietal ridges are conspicuously raised, the parietals on either side enclosing a concave, pearshaped, smooth area. Toes less than half-webbed. Subarticular tubercles on toes not very clearly demarkated from the equally prominent warts. Dorsum with very prominent warts.

All earlier descriptions of colour are from preserved specimens. The live colouration is as follows. Females light brownish yellow on head and back. Sides of head and body marbled with black. Limbs banded. Venter marbled on throat, chest and front half of belly. Some of the larger females, however, has a uniformly dark brown crown and dorsum.

Males (breeding) are almost brightly coloured, the dominant one being yellow. Sides marbled with light or reddish brown. Venter not marbled. The yellow is lacking in non-breeding males collected from under stones which are brownish above.

Notes on breeding : On the morning of 3rd February, 1979, I could hear from my tent the males calling in the typical toad fashion. The breeding site was a 200 metre stretch of Kunthi River. Several hundred pairs of males and females were found in amplexus, many in the process of laying long strings of eggs. Only two or three batches of already laid eggs were seen suggesting that breeding and laying started only on the previous night. Neither eggs nor breeders were noticed on any of the previous three days when I had occasion to cross the river at that point. No breeders were seen either two days later when we had to cross the river at that point while shifting camp.

The river at the breeding site was shallow and flowed over a bed of pebbles. Giant boulders rose here and there. There were reed forests on both sides of the river—a favourite feeding ground of elephants.

4. *Bufo microtympanum* Boul

1882. *Bufo microtympanum*, Boulenger, *Cat. Batr. Sal. Brit. Mus.* : 307.

A single example of this toad is available in the collections taken near the 16 Km point to Mukkali on 18.1.1979.

The specimen measures 34 mm from tip of snout to vent. Tympanum small, less than half diameter of eye. Upper surface with warts and tubercles, brown in colour. Venter pale, marbled with brown.

5. *Bufo silentvalleyensis* Pillai

1981. *Bufo silentvalleyensis* Pillai, *Bull. zool. Surv. India*, 3 (3) : 156.

A single specimen collected near Valiaparathodu on 17 January, 1979.

Smooth skin, slender limbs, parietal ridge directed obliquely inwards.

6. *Pedostibes tuberculosus* (Gunther)

1882. *Nectophryne tuberculosa*, Boulenger, *Cat. Batr. Sal. Brit. Mus.* : 280.

A single example of this rare tree toad is available collected by Dr. S. K. Bhattacharya on 15.1.1980 from a spot in Silent Valley, 24 Km Northwest of Mukkali.

Subsequent to the original description of this toad by Gunther (1875) from Malabar, no more material has been collected and as such the present record of this toad from Silent Valley is very significant.

Fingers webbed at base, toes nearly entirely webbed (the three distal phalanges of fourth toe being fringed by the webs), tips of fingers and toes dilated in the form of truncated discs.

Skin of dorsum tubercular, brownish grey above, profusely marbled with pale with the result that the head appears to be spotted with dark brown, broad longitudinal lines behind head dorsally and dark brown on flanks, limbs barred, venter light brown with irregular pale markings.

7. *Ramanella montana* (Jerdon)

1934. *Ramanella montana*, Parker, *Monograph Microhylidae* : 91.

Three examples are being referred to this species, the largest measuring 30 mm in head and body collected from under a stone inside dense forest on 22.1.1979. The other two were collected at night along with *Rhacophorus malabaricus* on 21.4.1980 at an altitude of 1040 metres.

Snout longer than diameter of eye, finger with large triangular discs. Toes with slightly dilated tips, clearly webbed at base.

Skin smooth above, pale brown to chocolate, snout dark upto level of eyes and then narrowing to the median line to broaden between the shoulders, narrowing again to broaden once more and break up in the sacral region. Limbs with crossbars. Lower surfaces brown or dark brown with white spots and blotches.

8. *Micrixalus nudis* Pillai

1978 a. *Micrixalus nudis* Pillai, *Proc. Indian Acad. Sci.* : 173.

A small example, measuring 13.5 mm in body length is being

referred to this species, originally described from Wynad (Pillai, 1978). This constitutes its second record.

Dorsum brownish without dorsolateral glandular folds or other markings. A chocolate coloured band from behind eye to shoulder. Limbs with cross bars. Ventrally white, throat and breast marbled with brown.

9. *Micrixalus thampii* Pillai

1981 a. *Micrixalus thampii* Pillai, *Bull. zool. Surv. India.* : 153.

Two specimens, a female and a male were collected near the dam site on 26th and 27th January, 1979.

10. *Micrixalus saxicola* (Jerdon)

1890. *Micrixalus saxicola*, Boulenger, *Fauna Brit. India* : 465.

A single specimen, 30 mm from tip of snout to vent belonging to this species is available in the collection, taken on 21.4.80 from near the dam site at an altitude of 870 metres.

Fingers and toes with large discs, hind limbs long and fully webbed. Skin smooth above, slate brown with lighter, irregular markings. Pale white below, throat and breast brownish.

The specimen was clinging to the vertical side of a boulder projecting from the fast flowing Kunthi River, its cryptic colour merging well with the moist surface of the rock making it practically invisible.

11. *Nannobatrachus beddomii* Boul.

1882. *Nannobatrachus beddomii* Boulenger, *Cat. Batr. Sal. Brit. Mus.* : 466.

9 examples of small-sized ranids, the largest of which measures 20 mm in total length are being referred to this rare species. Eight examples were collected by the author on 24.1.79 from forest litter in the central part of Silent Valley (alt. approximately 1000 m). One example was collected by Dr. S. K. Bhattacharya on 29.1.1980 from Valiaparathode.

The vertical condition of the pupil is not very clearly seen as is often the case after preservation, the same condition being observed

in the related genus, *Nyctibatrachus* (See Pillai, 1978). Stout for its size. Tympanum indistinct. Vomerines present, snout blunt, without canthus rostralis, inter-orbital space narrower than upper eye lid, fingers short and blunt-tipped, first shorter than second, toes with small discs, webbing rudimentary, a small inner metatarsal tubercle. Tibio-tarsal articulation reaches eye when adpressed. Skin smooth, brownish above with a few darker spots, two light bands on back on each side of the middle, limbs with cross bars. White beneath, throat brownish. Thickened, whitish, oval patches on the inner aspect of thighs extending from its base to more than half its length in one male example.

Nannobatrachus beddomii, known from Malabar and Tinnevely hills, is being recorded for the first time after its original description by Boulenger in 1882, after a gap of more than a hundred years.

12. *Nyctibatrachus major* Boul.

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

Many examples are available from all over Silent Valley, the largest measuring 47 mm from tip of snout to vent.

Two males measuring 42 mm and 38 mm have much darker throats, nuptial pads on the inner aspect of first finger and two whitish oval thickened patches on the ventral side of the thighs, close to each other as in the male of *Nannobatrachus beddomii*, but shorter and broader.

Skin of back and sides with corrugations and wrinkles. Brown or dark brown above, limbs barred. Throat brownish. Venter pale.

13. *Rana limnocharis* Wiegmann

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

A number of examples have been collected at various altitudes ranging from 800 to 1050 metres. Those collected from a stream at Panthencode on 16.1.1979 were breeding, males were calling.

14. *Rana beddomii* (Gunther)

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

Many examples of this species are available from various areas

within Silent Valley, small examples to large ones measuring over 55 mm in total length.

A good deal of variation in colour has been noticed. Generally brownish above with indistinct dark spots. Some has a light vertebral line from between the eyes to the hind end. A dark interocular line is most common. A black streak on the canthus rostralis and a temporal streak enclosing the tympanum are distinctive. A few specimens, are fully pale whitish above with no colour or markings, the temporal and canthal streaks becoming very prominent.

A few tadpoles with long tail which have been collected from moist vertical surface of rocks near the dam site apparently belong to this species.

15. *Rana temporalis* (Gunther)

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

Maximum number of examples in the collection belong to this species, their habit of sitting exposed on rocks and pebbles in running water making them easy for capture. They also allow close approach. Large specimens were seen foraging on forest floor in the proximity of water. They are available even at altitudes of 1100 metres or more though Annandale (in Boulenger, 1920) states that they are not found at great altitude.

Dorsum between the two dorsolateral glandular folds brownish, often with a few scattered dark spots. Outer edge of dorsolateral folds darker, canthus rostralis and temporal region also darker, continued backwards on flanks. Limbs with brownish cross bars. Venter whitish, throat and breast at times brownish.

16. *Rhacophorus malabaricus* Jerdon

1890. *Rhacophorus malabaricus*, Boulenger, *Fauna Brit. India* : 473.

Two examples of these have been collected at night near the dam site on 22. 4. 80. They were found clinging on to a rock in a stagnant pool of water far away from the river.

Colour when live was very distinctive. Dorsum green, flanks paler with greenish dots, hind margin of thighs yellowish red. Ventrally yellowish. The fully webbed fingers and toes had a different

colour scheme. Outer webs of fingers crimson, inner green. Webs on toes fully crimson.

17. *Philautus variabilis* (Gunther)

1890. *Ixalus variabilis*, Boulenger, *Fauna Brit. India* : 487.

15 examples collected on 17th, 22nd, 24th, 27th January, 1979 and 22nd, 30th April, 1980 belong to this species.

Uniformly brownish above or variously marked. Flank is some lighter. Ventrally granular, white, throat and breast brown.

At the time of collection some were green in colour and faintly mottled.

18. *Philautus signatus* Boulenger

1890. *Ixalus signatus*. Boulenger, *Fauna Brit. India* : 487.

Two examples measuring 24 mm and 33 mm in total length. Limbs are comparatively thin for the body.

A small pointed papilla on tongue. Skin smooth, brownish above in the smaller specimens and with patterns in the larger one. White below, belly granular.

19. *Philautus pulcher* Boulenger

1882. *Ixalus pulcher* Boulenger, *Cat. Batr. Sal. Brit. Mus.* :469.

A single specimen measuring 23 mm from tip of snout to vent collected on 16.1.1979

No lingual papilla, fingers with a rudiment of web, tips with large discs, toes more than half webbed and with discs.

Skin smooth above, granular on belly. A beautiful frog, leaf green above when collected (turned purple in spirit). Fore arms with two or three large green spots above. Femur with a median thin dorsal green line, tibia fully green. Ventrally white.

The specimen was found attached to a leaf and with legs drawn close to the body it was perfectly oval in shape.

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