

AMPHIBIAN FAUNA OF GARO HILLS, MEGHALAYA WITH
DESCRIPTION OF A NEW SPECIES OF *RANA*

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(With 1 Text-figure)

INTRODUCTION

Except for a few scattered references by Boulenger (1882, 1890, 1919, 1920) there is as yet no account dealing with the Amphibian fauna of Garo Hills, Meghalaya. Even in the above, the locality is often given as "Assam" which in those days included practically the whole of North-eastern India. N. E. India presents regions exhibiting diversities in terrain, vegetation, altitude, rainfall etc. constituting barriers which influence faunal distribution. This would make it very desirable to have a knowledge of the faunal composition and its spatial distribution. Annandale (1912) has reported on the Amphibia from the Siang District of Arunachal Pradesh. Pillai and Chanda (1979) have worked out the Amphibian fauna of Khasi Hills and have given the distribution pattern of Amphibia in the Northeastern part of India (1976). The present paper deals with the Amphibia of Garo Hills. A brief topographical account of Garo Hill District is given by Pillai and Yazdani (1977) while working out the Ichthyofauna.

The material reported on was collected as a result of four faunistic survey tours to Garo Hills during the years 1965 to 1973. In all we have examined 109 specimens belonging to 6 genera and 11 species, one of which is described as new. The list presented here is by no means complete. For instance *Nectophryne kempfi*, *Philautus* (= *Ixalus*) *garo*, *P.* (= *Ixalus*) *kempiae* (Boulenger, 1919) and *Rana garoensis* (Boulenger, 1920) which have been described from Garo Hills are not represented in the collection. There is no doubt that further intensive surveys would yield more species.

References giving detailed descriptions are indicated below each species. Notes, where necessary, and colour pattern are given.

The discovery, in Garo Hills, of *Microhyla berdmorei* hitherto known only from Burma, Siam, Cambodia, Malay Peninsula and Sumatra

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deserves special mention. This substantiates the presence in North-east India of Burmese faunal elements.

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List of localities of collection

- (1) Anuka village stream, 3 km from Baghmara.
- (2) Baghmara.
- (3) Cherikuty, 11 km from Bajengdoba I. B.
- (4) Cranol river about 9 km west of Tura
- (5) Dainadubi Reserve forest about 8 km south of Damra.
- (6) Dainadubi about 8 km south of Dudhnai I. B.
- (7) Damra, about 2 km south of Damra forest rest house.
- (8) Darugiri forest stream about 5 km south of Darugiri.
- (9) Darugiri—songsak road about 4 km south of Darugiri.
- (10) Degrengiri.
- (11) Dobaripara, 2 km south of Tura town.
- (12) Dudhnai about 5 km west of I. B.
- (13) Phulbari.
- (14) Rongjeng.
- (15) Rongrengiri reserve forest.
- (16) Rongring river, about 17 km west of Tura.
- (17) Rongtham.
- (18) Siju Cave.
- (19) Singhara river about 8 km west of Phulbari.
- (20) Songkhama about 6 km from forest rest house.
- (21) Songsak reserve forest.
- (22) Someswari river, near I. B. Siju.
- (23) Tura.
- (24) Wageasi river.

List of Amphibia from Garo Hills

The 11 species which have been studied by us are listed below. Classification and nomenclature have been adopted from the checklist given by Gorham (1974).

Class AMPHIBIA

Order ANURA

Family RANIDAE

Genus (1) *Rana* Linnaeus

- (1) *Rana limnocharis* Wiegmann
- (2) *Rana cyanophlyctis* Schneider
- (3) *Rana danieli* Pillai and Chanda
- (4) *Rana laticeps* Boul.
- (5) *Rana bilineata* n. sp.

Genus (2) *Amolops* Cope

- (6) *Amolops afghanus* (Günther)

Family MICROHYLIDAE

Genus (3) *Microhyla* Tschudi

- (7) *Microhyla ornata* (Dum. & Bibr.)
- (8) *Microhyla berdmorei* (Blyth)

Family RHACOPHORIDAE

Genus (4) *Rhacophorus* Kuhl

- (9) *Rhacophorus leucomystax* (Kuhl)

Family BUFONIDAE

Genus (5) *Bufo* Laurenti

- (10) *Bufo melanostictus* Schneider

Family PELOBATIDAE

Genus (6) *Megophrys* Kuhl & V. Hass.

- (11) *Megophrys monticola* Kuhl & V. Hass.

SYSTEMATIC ACCOUNT

1. *Rana limnocharis* Weig. 1835

Rana limnocharis, Boul. *Rec. Indian Mus.*, 1920, p. 28.

62 examples available from 18 widely distributed localities agree closely with published accounts of the species.

Upper parts fairly warty. Mid-dorsal white line present or absent ; when present it may be thin and faint or broad and conspicuous. Lower side white. Brown blotches on the throat in a few.

The largest example is a female measuring 41 mm from tip of snout to vent.

2. *Rana cyanophlyctis* Schn. 1799

Rana cyanophlyctis, Boul. *Rec. Indian. Mus.*, 1920, p. 12.

In all 26 adult specimens are available in our collection from 13 localities.

Skin of dorsum grayish or olive brown with dark round spots and sometimes with minute tubercles. Lower parts white, marbled or spotted. The largest example in the collection measures 62 mm from tip of snout to vent.

3. *Rana danieli* Pillai & Chanda

Rana danieli, Pillai & Chanda *J. Bombay nat. Hist. Soc.*, 1977, p. 136.

Material: 1 ex., from moist litter near Forest Ranger's office on Dudhnai—Cheran road, 8 April 1971, coll. *R. S. Pillai*; 2 exs., from Dianadubi forest, 9 km from Dudhnai I. B, 9 April 1971, coll. *R. S. Pillai*.

Rana danieli was erected by the present authors on the basis of three frogs collected from Khasi Hills. The present examples from Garo Hills agree fairly well, nevertheless show some minor variations as under.

The dorsal colouration is darker particularly in the two larger examples. The light brown area enclosed by the two dorsolateral stripes has black irregular spots. The marbling on flanks is also darker. Webs on toes dark. Lower side shows irregular patches of brown.

Tibio-tarsal articulation does not reach tip of snout in the two larger examples from Dianadubi while it does in the small example from Dudhnai-Cheran Road. Webbing on toes not as well developed as in the type specimens. Two distal digits of the fourth toe and one distal digit each of the other toes have only narrow fringes of webbing. Thus the extent of webbing in the Garo Hill material is slightly lesser than that from Khasi Hill.

Two of the examples measuring 56 and 50 mm collected from Dianadubi forests are adult males. Both have external vocal sacs and cornified patches on the front of the forearm. The smaller example measures 25 mm and this appears to be a juvenile female specimen.

Now that we have two adult males in our collection, the following additional notes are offered. The three examples of type material are all females. The males have darker colouration and shorter hind

limbs with the tibiotarsal articulation not reaching tip of snout. The tympanum also appears to be slightly larger in diameter in males than in females. The black stripes on the upper part of hind limbs tend to be broader and variegated in the males.

4. *Rana laticeps* Boulenger 1882

Rana laticeps, Boulenger, *Rec. Indian Mus.*, 1920. p. 67.

A single example, generally resembling *Rana verrucosa* Günther, is being assigned to *Rana laticeps*.

Fingers and toes with slightly dilated tips, feet three-fourths webbed, a prominent tarsal fold, inner metatarsal tubercle narrow, outer tubercle absent.

Skin corrugated above with warts and tubercles. Dark brown above, ventrally white, throat marbled with brown.

The present example is a gravid female collected from Dobaripara on 16 Feb. 1971. It measures 40 mm from tip of snout to vent.

R. laticeps is known from Bengal, Khasi Hills and Malay Peninsula. Its occurrence in Garo Hills, though hitherto unrecorded, is however not unexpected.

5. *Rana bilineata* n. sp.

(Text-fig. 1)

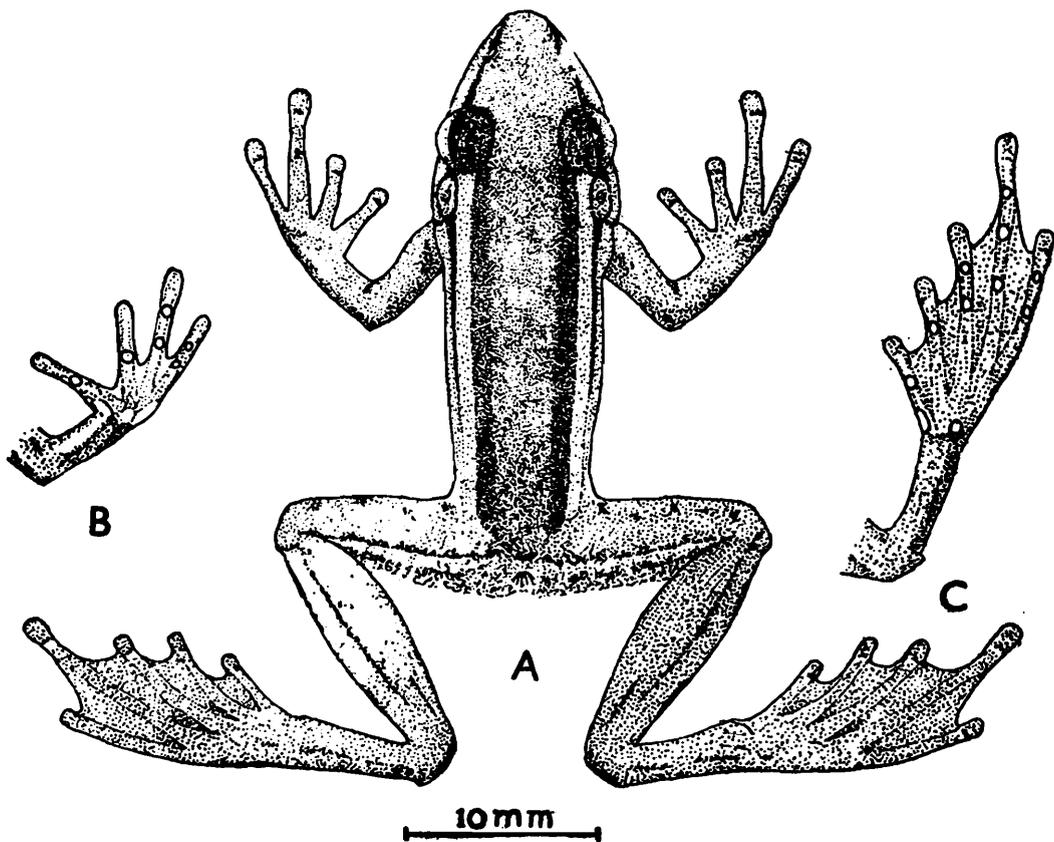
Colour : (in spirit) Dorsally brownish with no spots ; two prominent white lines from behind the eye to base of thigh, the inner edge of which is striped with deeper brown, the outer edge with a blackish stripe which is broadest behind tympanum. A similar stripe connects tip of snout with the front of eye passing through nostril. Femur, tibia and tarsus with longitudinal stripes running all the way down to the foot. No transverse markings. Lower parts white.

In life the specimen is leaf-green with the two lateral white stripes standing in contrast with the rest. There is another white stripe below the black stripe on the snout which run through the lower part of tympanum to the base of the upper arm. The upper part of thighs are also green with longitudinal stripes.

Head : Not much depressed, longer than broad, snout rounded, longer than eye, projecting beyond mouth, canthus rostralis obtuse, loreal region slightly concave. Nostril nearer to tip of snout than to eye. Distance between the nostrils about one and half times the interorbital distance. Tympanum distinct, large, about as large as eye.

Eyes with circular pupil. Vomerines in two oblique series in line with the front end of choanae. Tongue broader towards hind part, with two short horns behind.

Forelimbs: Short and thin, fingers fairly long, not webbed, (Text-fig. 1B) tips dilated into small discs. First finger a little shorter than second, third longer than snout; metacarpal tubercles prominent.



Text-fig. 1. (A-C) *Rana bilineata* Pillai and Chanda; A—Dorsal view, B—Ventral view of hand, C—Ventral view of foot.

Hindlimbs: Long and thin, tibio-tarsal articulation reaching eye, heels overlap when limbs are folded at right angles to the body; tibia 4 times as long as broad, about half length of head and body. Toes nearly entirely webbed, two terminal phalanges of fourth toe free, tips dilated into small discs without circum-marginal grooves, subarticular tubercles well developed, inner metatarsal tubercle small, outer one smaller (Text-fig. 1C).

Skin: Smooth above and very faintly tuberculated towards the hind part; white glandular dorsolateral fold from eye to groin, the maximum width between the two being about one-sixth of length from snout to vent. Another glandular fold from below eye ending in two glandules near shoulder. A faint fold above tympanum. Hind part of thigh beset with closely packed hexagonal prominences. Belly, breast and throat with white sub-cutaneous dots.

Skeleton : Upper jaw toothed ; clavicles slender, horizontal ; omosternum with a bony style, forked behind. Terminal phalanges acute.

Measurements in millimetres

From snout to vent	...	29
Head	...	10
Width of head	...	9
Snout	...	5
Eye	...	3.5
Interorbital width	...	3
Tympanum	...	3
Forelimb	...	15
First finger	...	4
Second finger	...	4.5
Third finger	...	6
Fourth finger	...	4.5
Hind limb	...	44
Tibia	...	15
Foot	...	15
Third toe	...	10
Fourth toe	...	14
Fifth toe	...	10

Holotype : A young frog Reg. No. V/ERS. 914 in spirit, loc. Dianadubi forest, Garo Hills (alt. about 400 metres), coll. R. S. Pillai, 8. IV. 1971.

The type specimen has been deposited with the Eastern Regional Station, Zoological Survey of India, Shillong.

Type locality : This beautiful little frog was collected from Dianadubi forest, about one kilometre from the Ranger's office. The forest was covered with moist litter mainly consisting of decaying leaves of sal (*Shorea robusta*). Many other species of frogs were also collected from this biotope which was exceptionally rich in animal life. The collection was made at night with the help of a petromax light. There were no water bodies in the immediate vicinity. A culvert, close by was totally dry at that time.

It is difficult to place this species close to any of the known species under the subgenus *Rana* to which it undoubtedly belongs. The two

species with which it has some resemblance are *Rana malabarica* Tschudi and *R. danieli* Pillai & Chanda.

6. *Amolops afghanus* (Günther) 1858

Rana afghana, Boulenger, *Cat. Batr. Sal. Brit. Mus.*, 1882, p. 60.

Rana latopalmata, Boulenger, *Rec. Indian. Mus.*, 1920, p. 217.

3 examples belonging to this species are available from Siju cave.

Upper parts granular, sides more so. An indistinct fold above tympanum. Lower parts smooth, hind part of thigh with large granules. Brownish black dorsally with variegations of a lighter hue, thighs with faint bars. Ventrally whitish to light brown. Throat and chest and sometimes belly also with patches of grey.

Largest specimen measures 110 mm from tip of snout to vent.

7. *Microhyla ornata* (Dum. & Bibr.) 1841

Microhyla ornata, Parker, *Mon. Micro.*, 1934, p. 139.

To this species we assign a small frog collected from decaying litter from Sal Forest in Dudhnai measuring 22 mm in head and body. It agrees well with the descriptions of the species by Parker (1934). There is a semi-circular dark patch enveloping the vent. The throat is dark, the example being a breeding male.

8. *Microhyla berdmorei* (Blyth) 1856

Microhyla berdmorei, Parker, *Mon. Micro.*, 1934, p. 127.

A stouter and larger microhylid than the previous species represented by 3 examples from decaying litter from Sal forest in Dudhnai. Forelimbs slender, fingers with slightly swollen tips, first finger much smaller than second. Toes with larger discs with median groove separating the two pads, almost fully webbed, the last digit of fourth toe with only a fringe. Tibiotarsal articulation reaches well beyond tip of snout.

Skin smooth. Pinkish or deep slaty-grey above and sides. Black spots on limbs occasionally. Throat and chest clouded with brown, rest of venter without markings.

Microhyla berdmorei is known so far only from Burma, Siam, Malay Peninsula and Sumatra and hence the record of this species from India is interesting. With this species the number of Microhylid frogs known from India goes upto three, the two others being *M. ornata* and *M. rubra*.

The largest of our example measures 35 mm from tip of snout to vent.

9. **Rhacophorus leucomystax** (Kuhl) 1829

Rhacophorus leucomystax, V. Kampen, *Amph. Indo-Austr. Arch.* 1923, p. 246.

The two examples, one from Rongjeng and the other from Songsak forest agree well with the descriptions of the species.

Upper parts dark grayish, sometimes spotted. Limbs with black bars. Belly and thigh white, granulated.

The largest example measures 75 mm in head and body.

10. **Bufo melanostictus** Schneider 1799

Bufo melanostictus, Boul. *Cat. Batr. Sal. Brit. Mus.*, 1882, p. 306.

Five examples of toads collected from four localities are being assigned to this species.

The larger example measures 103 mm from tip of snout to vent.

11. **Megophrys monticola** Kuhl & V. Hass., 1882

Megalophrys montana Boul. *Cat. Batr. Sal. Brit. Mus.*, 1882, p. 442.

This species is represented by a single example collected from Rongrengiri.

Skin loose and smooth dorsally with a few scattered minute granules. A prominent median horn-like tubercle on level with the anterior part of eye. A strong supratympanic fold connecting the eye and terminating at the shoulder in a glandule. A distinct fold from below eye to lower part of tympanum. Upper eyelid slightly angular and projecting. Two lateral folds on the back and two faint V-shaped folds, one connecting the upper eyelids and other connecting the tympanum. Thigh with short oblique pad-like prominence in the middle of its hind side.

Upper part brown, lower side pale. A small white tubercle on each side of breast.

The specimen measures 47 mm from tip of snout to vent.

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