

AMPHIBIAN FAUNA OF NAGALAND WITH NINETEEN NEW RECORDS FROM THE STATE INCLUDING FIVE NEW RECORDS FOR INDIA

J. Meren Ao¹, Sabitry Bordoloi² and Annemarie Ohler³

¹ Kohima Science College, Kohima, Nagaland, India.

² Associate Professor, In-Charge, Resource Management and Environment Division, Institute of Advanced Study in Science and Technology (IASST), Jawaharnagar, Khanapara, Guwahati, Assam 781022, India.

³ Departement de Systematique, UMS 0602, 25 rue Cuvier, 75005 Paris, France.
Email: ²sabitrybordoloi@rediffmail.com; ³ohler@mnhn.fr

Abstract

The amphibian fauna of Nagaland is updated to 32 species, 19 of which are new to the state and five species, *Megophrys wuliangshanensis*, *Megophrys glandulosa*, *Amolops viridimaculatus*, *Rana humeralis* and *Rhacophorus gongshanensis*, are new to India. The elements that compose this fauna are complex and include species from Himalayan region from north-eastern montane region and also from the Indian subcontinent.

Keywords

Amolops viridimaculatus, *Amphibia*, *India*, *Megophrys glandulosa*, *Megophrys wuliangshanensis*, *Nagaland*, *new records*, *new synonymy*, *Rana humeralis*, *Rhacophorus gongshanensis*

Introduction

The Indian state of Nagaland lies between 25°15'-27°04' N latitude and 93°20'-95°15' E longitude. It is bordered on the north by Arunachal Pradesh, on the west by Assam, south by Manipur, north-east by Arunachal Pradesh and east by Myanmar. The area of the state is 16,527km². The state is hilly with wide deep gorges and steep terrain except narrow valleys. The mountain system is an offshoot of the Himalayan mountain system. The altitude varies between 110 and 3830m. The low mountain range runs from north to south along Assam-Nagaland border and is composed of rather low hills with altitude less than 1000m. A hill range with peaks higher than 1800m with thick forest runs from north to south and divides the wetlands of Brahmaputra valley in India and the Chindwin wetlands in Myanmar. The Patkai

mountain system with thick forest cover forms the international boundary between India and Myanmar. The highest peak of Patkai range is Saramati with a height of 3837m above sea level.

The Barail mountain system with thick forest cover run in an east-west direction. The highest peak of this mountain system is Japfu which attains 3040m.

The climate of the state is subtropical but shows altitudinal zonation. The summer and winter temperatures vary from 0 to 29°C in hill areas and in the foot hills they vary from 12 to 36°C. Saramati and its adjacent peaks receive snowfall in winter. Ground frosting is common in winter above an elevation of about 900m. The vegetation is tropical in lowland, subtropical above 1500m, temperate above 2500m and subalpine above 3000m. The climatic condition is advantageous for high diversity of amphibians in the wetlands, swamps and other lotic and lentic habitats which abound all over Nagaland.

Most of the areas of Nagaland have remained unexplored for amphibian faunistic survey due to difficult hilly terrain. Kiyasetuo and Khare (1986) reported a new genus and species of frog from Nagaland, *Pterorana khare*. A year later, they reported on the presence of *Rhacophorus bisacculus* Taylor, 1962 in Nagaland (Kiyasetuo & Khare, 1987). Chanda (1994) recorded 10 species of frogs from Nagaland. Kiyasetuo in his thesis (1986, unpublished) recorded 21 species from Kohima district. The present survey was carried out in different parts of Nagaland from 1998 to 2002.

The following list mentions the frogs collected during our survey from 1998 to 2002. Of the species recorded so far 19 species are new records from the state of which five are new records for India. The specimens have been deposited in the museum of

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Figure 1. Map of Nagaland (India) showing places of collection of amphibians.

- 1 – Changtongyu (26°34'N, 94°41'E); 2 - Tsurang (26°32'N, 94°24'E), Watiyem (26°30'N, 94°24'E); 3 - Mokokchung;
 4 - Jakama (25°35'N, 94°10'E); 5 - Chumukedima (25°49'N, 93°49'E); 6 - Sechu (25°41'N, 93°49'E);
 7 – Rukhroma (25°43'N, 94°07'E); 8 - Medziphema (25°45'N, 93°54'E); 9 - Dzulake (25°36'N, 94°00'E);
 10 - Sanuru (25°39'N, 94°06'E), Toulizie (25°39'N, 94°06'E); 11 - Puliebadze (25°37'N, 94°05'E);
 12 - Dzuna (25°37'N, 94°06'E); 13 - Itanki (25°40'N, 93°31'E)

the Kohima Science College, Kohima, Nagaland, India. The list gives their number in this collection (MA) and a few other specimens in other collections: Zoological Survey of India, Kolkata (ZSI), Muséum National d'Histoire Naturelle (MNHN).

For each species the valid name with its authority is given. Number and sex of specimens are listed with their collection number. For every locality of collection, altitude in meter above medium sea level is given. If available some data on ecology and habitat of the species in Nagaland are added. New taxonomic data are given in "Comments" section. The species are presented in alphabetical order of families, genera and species group names.

BUFONIDAE Gray, 1825

Bufo melanostictus Schneider, 1799

Materials examined

Six females, four males, MA 36-45.

Morphological characters

Large-sized frog (males SVL 72.0-81.0mm, females SVL 95.0-112.0mm), parotoid glands and cranial ridges present, dorsal skin rough with numerous warts bearing horny spinules; tips of fingers and toes rounded, webbing moderate; dorsal color black brown or yellow brown with dark brown lines on crest, ventrally creamy yellow.

Distribution

All South and Southeast Asia.

Remarks

Commonly present in the localities up to 2440m. Found in a variety of terrestrial habitats, including vicinity of human settlements.

HYLIDAE Rafinesque, 1815

Hyla annectans (Jerdon, 1870)

Materials examined

15 Females, five males, Puliebadze (25°37'N, 94°05'E), 2225m, MA 46-65.

Morphological characters

Small-sized frog (male SVL 31-41mm, females SVL 41-49mm), smooth dorsal skin, fingers and toes with toepads, webbing moderate, dorsal color uniformly green with a dark line from tip of snout, canthus rostralis, tympanic fold to groin.

Distribution

Southern Asia (south of Himalaya) from Assam and Meghalaya

(India) through northern Myanmar, Thailand, and Vietnam to western China.

Remarks

Arboreal in the post breeding season. Breeding in ponds and other water bodies. This species has been first described from Khasi Hills, Meghalaya, and shows a large distribution including Burma, Thailand, Vietnam and China. In China up to five subspecies are recognised. *Hyla annectans* is a species that seems to be limited to higher altitudes, particularly in the southern parts of its distribution. In Nagaland it can be observed above 1400m.

MEGOPHRYIDAE Bonaparte, 1850

Megophrys glandulosa (Boulenger, 1890)

Materials examined

Three females, one male, Puliebadze (25°37'N, 94°05'E), 2225m, MA 22-25.

Morphological characters

Large-sized frog (males SVL 70-75mm, females SVL 74-82mm), dorsal skin smooth with fine ridges, laterally numerous glandular warts, a posteriorly thickened supratympanic fold; tips of fingers and toes rounded, rudimentary webs; dorsal color brown or gray brown, a brown black triangular spot between eyes, upper lip margin with a light colored longitudinal stripe, tubercles on flanks half black and half yellow; black spots on both sides of throat, posterior belly and ventral thighs with many dark colored spots.

Distribution

China (Yunan) and India (Nagaland).

Remarks

New record for India. Forest floor dwelling, found near streams among bushes and shrubs.

Megophrys major (Boulenger, 1908)

Materials examined

One female, one male, Dzuna (25°37'N, 94°06'E), 1980m, MA 20-21.

Morphological characters

Large-sized frog (males SVL 68-75mm, females SVL 80-92mm), dorsal skin smooth with fine foldings and small tubercles, large tubercles on flanks, posterior part of supratympanic fold not enlarged; tips of fingers and toes rounded; rudimentary webs; dorsal color olive green or dark green, a dark brown triangular spot between eyes, upper lip margin with a light colored stripe, dorsum with a "Y"-shaped spot; some thin dark stripes on throat; belly and ventral thighs without spots.

Distribution

China, India, Laos, Myanmar, Thailand, Vietnam.

Remarks

Forest floor dwelling, found near stream among the bushes, shrubs and leaf litters. New record for Nagaland. The specimens show the typical band on the upper lip. We use the name *Megophrys major*, as *Ixalus lateralis* Anderson, 1871 should apply to a member of the genus *Leptotalax* Dubois, 1980 (Dubois *et al.*, in prep.).

***Megophrys wuliangshanensis* Ye & Fei, 1995**Materials examined

Eight females, two males, Puliebadze (25°37'N, 94°05'E), 2225m and Noklak (26°03'N, 95°04'E), 1524m, MA 26-35.

Morphological characters

Small-sized frog (males SVL 27-32mm, females SVL 41-42mm), dorsum densely covered with granules, these granules forming ridges; large tubercles on lateral body, tips of fingers and toes rounded, webbing absent, dorsal color red brown or light red brown, a dark brown triangular spot between eyes and a X-shaped spot on back, longitudinally running dark stripes on lateral body, belly and ventral legs with round dark brown spots.

Distribution

China (Yunnan) and India (Nagaland).

Remarks

New record for India. Forest floor dwelling, on rainy days observed in the daytime also.

MICROHYLIDAE Günther, 1858***Microhyla ornata* (Duméril & Bibron, 1841)**Materials examined

Six females, five males, Chumukedima (25°49'N, 93°49'E), 250m; Kohima (25°37'N, 94°02'E), 1444 m, MA 66-76.

Morphological characters

Small-sized frog (males SVL 23-27mm, females SVL 23-28mm), dorsal skin smooth, tips of fingers and toes pointed, rudimentary web, dorsum with fine lines in divers brown and greyish tones forming triangular pattern, side of head and flanks dark brown.

Distribution

Common all over oriental region.

Remarks

Found under leaf litter and crevices in paddy fields.

RANIDAE Rafinesque-Schmaltz, 1814***Amolops gerbillus* (Annandale, 1912)**Materials examined

Two females, one male, Dzuna (25°37'N, 94°06'E), 1700m, MA 89-91.

Morphological characters

Moderate-sized frog (male SVL 72-76mm, females SVL 82-87mm), dorsal skin shagreened, tips of fingers and toes with large discs, webbing large, dorsal colour grey with brown marbling, ventral body yellowish.

Distribution

China, India.

Remarks

New record for Nagaland. Torrent living frogs.

***Amolops marmoratus* (Blyth, 1855)**Materials examined

Eight females, four males, Jakama (25°35'N, 94°10'E), 1600m, Tsurong (26°32'N, 94°24'E), 914m, MA 77-88.

Morphological characters

Moderate-sized frog (males SVL 57-63mm, females SVL 72-93mm), dorsal skin smooth, tips of fingers and toes with discs, webbing complete, dorsal color greenish (in life) with brown spots, legs with distinct bands, ventral side pearly white.

Distribution

China, India, Nepal, Thailand.

Remarks

Torrent living, in streams with rocky bottom and boulders.

***Amolops monticola* (Anderson, 1871)**Materials examined

12 females, three males, Dzuna (25°37'N, 94°06'E), 1980m, MA 100-114.

Morphological characters

Small-sized frog (males SVL 38-47mm, females SVL 58-66mm), dorsal skin smooth with dorsolateral folds, tips of fingers and toes with discs, webbing complete, dorsal color variable from dark brown to light pale yellow, scattered with irregular brown markings, legs with crossbars, belly without spots.

Distribution

China, India, Nepal.

Remarks

New record for Nagaland. Torrent living frogs.

***Amolops viridimaculatus* (Jiang, 1983)**Materials examined

Six females, two males, Dzuna (25°37'N, 94°06'E), 1980m, MA 92-99.

Morphological characters

Large-sized frog (males SVL 73-82mm, females SVL 83-94mm), dorsal skin smooth, flanks with tubercles, tips of fingers and toes with discs, webbing complete, dorsal color flanks brown with large, large green spots, in between them scattered small green spots, legs with green crossbars.

Distribution

China (Yunnan), India (Nagaland).

Remarks

New record for Nagaland. In streams with rocky bottom.

***Chirixalus vittatus* (Boulenger, 1887)**Materials examined

Four females, two males, Sanuru (25°39'N, 94°06'E), 1410m,; Sechu (25°41'N, 93°49'E), 1000m, MA 262-267.

Morphological characters

Small-sized frog (males SVL 23-26mm, females SVL 24-27mm), dorsal skin smooth, tips of fingers and toes with small discs, webbing moderate, dorsal color yellow with evenly scattered with gray brown dots; a light yellow or cream white longitudinal stripe on each side of body from eye to groin.

Distribution

China, India, Myanmar, Thailand, Vietnam.

Remarks

Observed on bushes, in holes in trees and bamboo internodes.

***Euphlyctis cyanophlyctis* Schneider, 1799**Materials examined

10 Females, six males, MA 162-177

Morphological characters

Moderate-sized frog (males SVL 38-66mm, females SVL 45-92mm), dorsal skin finely granular, tips of fingers and toes pointed, webbing complete, dorsal color greyish olive above, with dark olive spots; a dark light-edged band along each flank; lower parts white or vermiculate.

Distribution

Afghanistan, Bangladesh, India, Iran, Nepal, Pakistan, Sri Lanka.

Remarks

Widely distributed up to 2440m. Aquatic.

***Fejervarya teraiensis* (Dubois, 1984)**Materials examined

12 females, five males, MA 181-197.

Morphological characters

Rather small-sized frog (males SVL 43-51mm, females SVL 49-56mm), dorsal skin with fine glandular folds, tips of fingers and toes pointed, webbing moderate, dorsal color greyish with darker spots, middorsal line or band .

Distribution

India, Nepal.

Remarks

New record for Nagaland. Widely distributed up to 2440m. Terrestrial, breeding in small ponds and ditches.

***Fejervarya nepalensis* (Dubois, 1975)**Materials examined

Eight females, four males, MA 198-209.

Morphological characters

Rather small-sized frog (males SVL 27-32mm, females SVL 32-40mm), dorsal skin with fine glandular folds, tips of fingers and toes pointed, webbing moderate, dorsal color greyish with darker spots and a middorsal line or band.

Distribution

India, Nepal.

Remarks

New record for Nagaland. Widely distributed. Aquatic.

***Hoplobatrachus crassus* Jerdon, 1853**Materials examined

Nine females, two males, Itanki (25°40'N, 93°31'E), 200m, MA 139-149.

Morphological characters

Large-sized frog (males SVL 76-90mm, females SVL 82-112mm), dorsal skin with longitudinal glandular folds, tips of fingers and toes pointed, webbing large, dorsal color yellowish to olive with dark spots, middorsal line absent.

Distribution

India, Nepal, Sri Lanka.

Remarks

New record for Nagaland. Semiaquatic.

***Hoplobatrachus tigerinus* Daudin, 1803**Materials examined

Eight females, four males, Medziphema (25°45'N, 93°54'E), 304m; Mankolemba (26°31'N, 94°26'E), 914 m, MA 150-161.

Morphological characters

Large-sized frog (males SVL 77-108mm, females SVL 86-162mm), dorsal skin with longitudinal glandular folds, tips of fingers and toes pointed, webbing large to complete, dorsal color yellowish to olive with dark spots, middorsal line present.

Distribution

India, Nepal, Sri Lanka.

***Paa mokokchungensis* (Das & Chanda, 2000)**Materials examined

Two males, ZSIA8889, Mokokchung, 1200m. Stream dwelling species. So far this species has been recorded only from this locality in Nagaland.

Morphological characters

Large-sized frog (males SVL 87mm), dorsal skin with glandular tubercles, tips of fingers and toes swollen, webbing large, dorsal color dark brown.

Distribution

India (Nagaland).

***Philautus annandalii* (Boulenger, 1906)**Materials examined

Four females, two males, Sanuoru (25°39'N, 94°06'E), 1410m; Khonoma (25°37'N, 94°02'E), 1800m, MA 268-273.

Morphological characters

Very small-sized frog (males SVL 17-20mm, females SVL 22-26mm), dorsal skin smooth, tips of fingers and toes with discs, webbed at base, dorsal color greyish olive with a bar between eyes and a dark curved band on each side of back.

Distribution

India, Nepal.

Remarks

On bushes, can be found in day time also.

***Philautus garo* (Boulenger, 1919)**Materials examined

Two males, Dzulake (25°36'N, 94°00'E), 1791m, MA 274-275.

Morphological characters

Very small-sized frog (males SVL 22-23mm), dorsal skin smooth, tips of fingers and toes with discs, webbed at base, dorsal color grey with dark brown hourglass-shaped blotch.

Distribution

India (Meghalaya, Nagaland).

Remarks

New record for Nagaland. Arboreal, in moist forest.

***Phrynoglossus borealis* (Annandale, 1912)**Materials examined

Two females, one male, Medziphema (25°45'N, 93°54'E), 304m, MA 178-180.

Morphological characters

Small-sized frog (male SVL 28mm, females SVL 30-38mm), dorsal skin with small glandular warts, tips of fingers and toes rounded, webbing large, dorsal color greyish brown.

Distribution

Bhutan, India.

Remarks

New record for Nagaland. Found half buried in sand near streams, under stones near water fall etc.

***Polypedates megacephalus* Hallowell, 1861**Materials examined

Three females, two males, Watiyem (26°30'N, 94°24'E), 300m, MA 257-261.

Morphological characters

Moderately-sized frog (males SVL 41-48mm, females SVL 57-65mm), dorsal skin smooth, no co-ossified skin on head, tips of fingers and toes with large discs, webbing moderate, dorsal color light brown with triangular spot between eyes and dots on back.

Distribution

China, India, Nepal.

Remarks

New record for Nagaland. In undisturbed forest areas.

***Polypedates teraiensis* (Dubois, 1987)**Materials examined

10 females, eight males, Medziphema (25 45'N, 93°54'E), 304m; Kohima, 1444m, MA 239-256.

Morphological characters

Large-sized frog (males SVL 52-63mm, females SVL 70-84mm), dorsal skin smooth with co-ossified skin of head, tips of fingers and toes with large discs, webbing moderate, dorsal color light brown with longitudinal brown lines.

Distribution

India (Arunachal Pradesh, Nagaland), Myanmar, Nepal.

Remarks

New record for Nagaland. Found in variety of terrestrial habitats, including vicinity of human settlements.

***Rana garoensis* Boulenger, 1920**Materials examined

Two females, one male, Sechu (25°41'N, 93°49'E), 1000m, MA 122-124.

Morphological characters

Moderate-sized frog (males SVL 35-48mm, females SVL 50-58mm), dorsal skin finely granular with dorsolateral folds, tips of fingers and toes with small discs, large web, dorsal color brown with irregularly set darker dots, lateral body dark brown.

Distribution

India, Nepal.

Remarks

New record for Nagaland. Forest dwellers, found near streams where they breed. Study of the syntypes of *Rana garoensis* Boulenger, 1920 (ZSI 18557, 2 specimens) and the holotype of *Rana danieli* Pillai and Chanda, 1977 (ZSIA6966) showed that these two names are synonymes. The back is finely granular in both forms, like in *Rana leptoglossa*, but not showing the distinct colour pattern formed by regularly positioned round dark brown spots. The webbing of both *Rana garoensis* and *Rana danieli* is similar and only leaves two phalanges free on finger two. The valid name of the species is therefore *Rana garoensis* Boulenger, 1920.

***Rana humeralis* Boulenger, 1887**Materials examined

One female, one male, Tsurong (26°30'N, 94°24'E), 305m, MA 120-121.

Morphological characters

Large-sized frog (males SVL 54-71mm, female SVL 82mm), dorsal skin granular with narrow laterodorsal folds, in males prominent humeral glands, tips of fingers and toes with small disks, webbing large, dorsal color brown with small black spots, flanks brown, upper lip whitish.

Distribution

India (Assam, Nagaland), Myanmar, Nepal.

Remarks

New record for India. Inhabit swampy areas of low lands.

***Rana khare* (Kiyasetuo & Khare, 1986)**Materials examined

Three males, Rukhroma (25°43'N, 94°07'E), 1440m; Jokhoma, 1600m, MA 115-117.

Morphological characters

Rather large-sized frog (males SVL 50-59mm), dorsal skin smooth with dorsolateral folds and loose skin folds on flanks, tips of fingers and toes with moderate discs, webbing large, dorsal color dark brown, belly white.

Distribution

India (Nagaland).

Remarks

Semiaquatic. This frogs show loose skin similar to that found in males of some Brown frogs (*Rana temporaria* group) of Europe and Japan in breeding season. This skin flap probably facilitates breathing under water and may be linked to nest keeping behavior of the males. This is consistent with the observation of males staying under water near the clutches in mountain streams.

***Rana livida* (Blyth, 1855)**Materials examined

Four females, two males, Sechu (25°41'N, 93°49'E), 1000m, MA 125-130.

Morphological characters

Large sexual dimorphism, males moderate-, females large-sized (males SVL 43-51mm, females SVL 85-95mm), dorsal skin smooth with indistinct dorsolateral folds, tips of fingers and toes with moderate discs, webbing large, dorsal color green with few dark rounded spots, lateral body and legs brown.

Distribution

China, India, Laos, Myanmar, Thailand, Vietnam.

Remarks

New record for Nagaland. Living in water falls, streams and similar habitats.

***Rana mawphlangensis* Pillai & Chanda, 1977**Materials examined

Six females, two males, Dzuna (25°37'N, 94°06'E), 1980m, MA 131-138.

Morphological characters

Large-sized frog (male SVL 80mm, females SVL 96-106mm), dorsal skin with distinct glandular warts and horny spinules, tips of fingers and toes moderately enlarged with discs, webbing moderate, dorsal color brownish with bluish brown (green in life) spots and whitish horny spinules, throat and chest dark brown.

Distribution

India (Meghalaya, Nagaland, West Bengal, Manipur).

Remarks

New record for Nagaland. Near streams, semiaquatic. *Rana mawphlangensis* is a member of the subgenus *Odorrana* Fei, Ye & Huang, 1990, and is morphologically close to the *Rana (Odorrana) andersonii* species group.

***Rana tytleri* (Theobald, 1868)**Materials examined

Two females, Watiyem (26°30'N, 94°24'E), 300m, MA 118-119.

Morphological characters

Rather small-sized frog (males SVL 28-32mm, females SVL 42mm), dorsal skin smooth with dorsolateral folds, tips of fingers and toes with small discs, webbing moderate, dorsal color bluish (green in life) with wide whitish lateral bands, black longitudinal stripes on hindlegs.

Remarks

New record for Nagaland. Found in swampy areas. Ohler & Mallik (2002) showed that the frogs of the *Rana (Hylarana)* subgenus (*sensu* Dubois, 1992) from northeastern India are distinct both from *Rana erythraea* (Schlegel, 1837) and from *Rana taipehensis* van Denburgh, 1909. These frogs should be called *Rana tytleri*.

***Rhacophorus bipunctatus* Ahl, 1927**Materials examined

Three females, two males, Puliebadze (25°37'N, 94°05'E), 2225m, MA 220-224.

Distribution

China, India, Malaysia, Myanmar, Thailand

Morphological characters

Rather small-sized frog (males SVL 32-39mm, females SVL 49-53mm), dorsal skin smooth, tips of fingers and toes with large discs, webbing complete; dorsal color brown or yellow, with dark brown X-shaped marking, posterior back with dark transverse stripes; flanks brightly yellow; legs with dark crossbars, toe web red.

Remarks

New record for Nagaland. Arboreal, found in thick forests, mostly on trees.

***Rhacophorus gongshanensis* (Yang & Su, 1984)**Materials examined

Seven females, four males, Puliebadze (25°37'N, 94°05'E), 2225m, MA 225-235.

Morphological characters

Moderately-sized frog (males SVL 54-72mm, females SVL 66-82mm), dorsal skin granular, tips of fingers and toes with large discs, webbing complete; dorsal color grass green, covered with sparse brown spots; lateral body and anterior and posterior sides of thigh with large and small cream yellow spots.

Distribution

China (Yunnan), India (Nagaland).

Remarks

New record for India. Arboreal, thick forest areas.

***Rhacophorus maximus* Günther, 1858**Materials examined

Six females, four males, Changtongyu (26°34'N, 94°41'E), 954m, MA 210-219.

Morphological characters

Large-sized frog (males SVL 62-80mm, female SVL 85-110mm), dorsal skin smooth, tips of fingers and toes with large discs, webbing complete, dorsal color bluish (green in life) with blackish webbing.

Distribution

China, India, Nepal, Thailand.

Remarks

New record for Nagaland. Found in thick forest area, both nocturnal and diurnal.

***Theلودerma asperum* (Boulenger, 1886)**Materials examined

Two females, one male, Toulizie (25°39'N, 94°06'E), 1444m; Sechu (25°41'N, 93°49'E), 1000m, MA 236-238.

Morphological characters

Small-sized frog (male SVL 30mm, females SVL 30-31mm), dorsal skin granular forming network-like ridges, tips of fingers and toes with discs, webbing moderate, anterior part of dorsum grey with brown spot between eyes, posterior par dark brown, greyish spots near vent which is dark brown.

Distribution

China, India (Assam, Nagaland), Malaysia, Myanmar, Thailand, Vietnam.

Remarks

New record for Nagaland. Found in stumps of bamboo internodes and holes in trees.

Discussion

The species listed by Chanda (1994) can be separated in four different biogeographic elements. The first group mainly includes species or names that cover species groups with large distributions, like *Rana limnocharis* (here as *Fejervarya teraiensis* and *F. nepalensis*), *Polypedates leucomystax* (here *P. megacephalus* and *P. teraiensis*) and *Bufo melanostictus*. A second group of species has its distribution area in the Indian subcontinent and reaches its easternmost range in Nagaland and western Myanmar, like *Hoplobatrachus tigerinus* or *Euphlyctis cyanophlyctis*. Some species (*Hyla annectans*, *Rhacophorus bimaculatus*, *Rhacophorus maximus*) can be considered to be elements of the northeastern montane region as defined by Inger (1999: 451) and *Rana khare* is an endemic form only known from Nagaland.

Our list adds 21 species to the fauna as published by Chanda (1994), five are new to India. It confirms close relationship of the amphibian fauna of Nagaland with that of northeastern region, but a link to the fauna from the Himalaya can be shown by the presence of species like *Phrynoglossus borealis*, *Fejervarya nepalensis* and *Philautus annandalii*, *Rhacophorus maximus*, *Megophrys major* and *Amolops monticola*. Some of the species found in Nagaland were first described from China (*Rhacophorus gongshanensis*, *Amolops viridimaculatus*) and are currently not known from inbetween localities, most probably because of lack of exploration.

The number of endemics might be higher after thorough revision of some groups, but the lack of data on the northeastern Indian region and on Myanmar does not allow such work currently. A series of taxonomic questions should be resolved. Kiyasetuo and Khare (1987) reported on the presence of *Rhacophorus bisacculus* Taylor, 1962 in Nagaland. This species has been described from central Thailand and is a member of a group of treefrogs that show very little morphological variation despite the existence of various names. The allocation of the specimens from Nagaland to a species name should be confirmed, but as no voucher specimens exist, we removed this species from the list.

The list of frogs from Nagaland now shows a total of 32 species which is almost three times the species of Chanda's (1994) list but probably much below the actual number of species. We yet cannot have any idea about the total number of species which should be much higher when compared to similar places in southeast Asia and Himalaya (see Ohler *et al.*, 2002, Dubois, 2000).

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