

AMPHIBIAN DIVERSITY AT BSI EXPERIMENTAL BOTANIC GARDEN, UMIAM, MEGHALAYA, INDIA

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Abstract

In a first of its kind study on the amphibian fauna in the 25 acre campus of the Experimental Botanic Garden of the Botanical Survey of India, Shillong located at Umiam, Ri-Bhoi, Meghalaya, surveys were made and a few representative samples collected. The outcome of the work is presented in this paper. The study reports 10 species of anuran amphibians belonging to 8 genera and 4 families. The IUCN status of the studied species were ascertained. One critically endangered species is also included in the list.

Keywords: Amphibian diversity; Meghalaya; North-East India

INTRODUCTION

The Eastern Regional Centre of Botanical Survey of India located in Shillong, Meghalaya, was established in 1956 with the objective to explore, survey and document the phytodiversity of the North East India. There is an extension campus of BSI at Umiam by the side of Lake Umiam in the Ri-Bhoi District of the state, situated about 22 km away from Shillong where an Experimental Botanic Garden is maintained. The campus harbours 756 species of angiosperms, 13 species of gymnosperms, 49 species of pteridophytes and 53 species of bryophytes. Besides, ex-situ conservation of the endangered and endemic pitcher plant of Meghalaya, *Nepenthes khasiana* is maintained. Amidst this setting of diverse flora, it naturally follows that this Botanic Garden will also harbour a diverse fauna, taking into consideration that the gently sloping and thickly forested landscape is supplemented with a pond in the middle and a flowing stream of water providing ideal habitat to a host of insects, fish, amphibians, reptiles and bats. However, with the exception of the butterfly fauna (Bora *et. al.*, 2014) there is no documented reports on other groups of

animals. In this paper, an attempt is made to document the amphibian diversity of this Experimental Botanic Garden (Fig. 1).

STUDY AREA

Located at an altitude of 1000 meter above sea level and spread over an area of 25 acres, the BSI Botanic Garden at Umiam, Meghalaya is located just near the national highway connecting Guwahati and Shillong, by the shores of Lake Umiam. The campus is divided into two closed units, as the Shillong bypass road goes through it. There is a pond inside the campus, which is feed by a continual supply of water from a brook. The garden is forested with thick vegetation of various species of flora. It has different sections viz. Arboretum, Bamboosetum, Citrus, Edible Plants, Fern, Ginger, Insectivorous Plants, Medicinal Plants, Musa, Nursery, Orchid, Piper, Tree Fern sections etc. Many of the plants conserved in the garden are rare, endemic and economically important plants of North East India.

METHODOLOGY

A total of 20 specimens of anuran amphibians were collected by the team led by the first author, from the BSI Experimental Botanic Garden at Umiam (N 25° 40'40.7"; E 91°54'17.1"), which forms the material on which this paper is based. The collections were made in the months of August and September in 2016. Standard methodologies after Ravichandran (2004) were employed for collection and preservation of the specimens. Additionally, a few species are reported based upon their photographic record made by the fourth author. Identification and nomenclature followed is as per Darrel Frost (2017). For distribution ranges, Mathew & Sen (2010) was followed.

RESULTS

The following anuran amphibians have been recorded from BSI Botanic Garden at Umiam.

Systematic List: Phylum: Chordata; Class: Amphibia; Order: Anura.

Species	IUCN Status
Family: Bufonidae	
<i>Duttaphrynus melanostictus</i> (Schneider, 1799)	Least Concern
Family: Dicroglossidae	
<i>Fejervarya pierrei</i> (Dubois, 1975)	Least Concern
<i>Fejervarya syhadrensis</i> (Annandale, 1919)	Least Concern
Family: Ranidae	
<i>Clinotarsus alticola</i> (Boulenger, 1882)	Least Concern
<i>Hylarana leptoglossa</i> (Cope, 1868)	Least Concern
<i>Odorrana chloronota</i> (Gunther, 1876)	Least Concern
Family: Rhacophoridae	
<i>Polypedates maculatus</i> (Gray, 1833)	Least Concern
<i>Polypedates teraiensis</i> (Dubois, 1987)	Not evaluated

<i>Raorchestes cf. shillongensis</i> (Pillai and Chanda, 1973)	Critically endangered
<i>Rhacophorus bipunctatus</i> (Ahl, 1927)	Least Concern

Species Account

Family: Bufonidae

Duttaphrynus melanostictus (Schneider, 1799) (Fig. 2)

Material: 2 exs. V/A/NERC/ZSI/1258-1259

Relatively abundant in the study area. A gravid female was collected to study but was released back.

Distribution: INDIA: Throughout India.

Elsewhere: Borneo; China; Indonesia; Malaysia; Nepal; Pakistan; Thailand; Sri Lanka.

IUCN Status: Least Concern.

Family: Dicroglossidae

Fejervarya pierrei (Dubois, 1975) (Fig. 3)

Material Examined: 2 exs. V/A/NERC/ZSI/1260-1261

With a broad yellowish mid-dorsal line on the dorsum with long skin folds. They are a common species found near human habitations.

Distribution: INDIA: Assam, Nagaland, Mizoram, Meghalaya & Arunachal Pradesh.

Elsewhere: Nepal. *IUCN Status:* Least Concern.

Fejervarya syhadrensis (Annandale, 1919) (Fig. 4)

Material Examined: 1 ex. V/A/NERC/ZSI/1262.

A small dicroglossid frog, without a mid dorsal line on the dorsum. Dorsum with small skin folds.

Distribution: INDIA: Assam, Manipur, Meghalaya, Odisha & Maharashtra.

Elsewhere: Nepal; Pakistan. *IUCN Status:* Least Concern.

Family: Ranidae

Clinotarsus alticola (Boulenger, 1882) (Fig. 5)

Material Examined: 9 exs.
V/A/NERC/ZSI/1263, 1264 & 1265

The most abundant species in the study area, this species is found near the pond of the BSI campus at Umiam. Their activity is more during the evening; however, a few individuals are active during the daytime as well.

Distribution: INDIA: Assam, Nagaland, Manipur, Tripura, Meghalaya, Mizoram, Sikkim, Odisha, Andaman & West Bengal.

Elsewhere: Bangladesh; China; Indonesia; Japan; Malaysia; Myanmar; Nepal; Sri Lanka; Thailand; Vietnam. *IUCN Status:* Least Concern.

Hylarana leptoglossa (Cope, 1868) (Fig. 6)

Material Examined: 4 exs.
V/A/NERC/ZSI/1266-1267

Collected near dead rotten logs, near the pond inside the BSI campus, Umiam. Active during the evening.

Distribution: INDIA: Arunachal Pradesh, Assam, Meghalaya, Mizoram & Tripura.

Elsewhere: Myanmar; Thailand; Vietnam. *IUCN Status:* Least Concern.

Odorrana chloronota (Gunther, 1876) (Fig. 7)

Material Examined: 1 ex.
V/A/NERC/ZSI/1268

Collected from the forest. Inhabits near open areas. Inconspicuous due to its green dorsum.

Distribution: INDIA: Assam, Meghalaya & Mizoram.

Elsewhere: China; Myanmar; Thailand; Vietnam.

IUCN Status: Least Concern.

Family: Rhacophoridae

Polypedates maculatus (Gray, 1833) (Fig. 8)

Material Examined: Nil.

No specimen was collected. Photography was done. Found commonly on the trees.

Distribution: INDIA: Throughout India except Haryana, Punjab and Rajasthan.

Elsewhere: Bangladesh; Nepal; Sri Lanka. *IUCN Status:* Least Concern.

Polypedates teraiensis (Dubois, 1987) (Fig. 9)

Material Examined: Nil.

No specimen was collected. Photography was done. Dorsal brown coloured with longitudinal lines present.

Distribution: INDIA: Throughout Northern India & North Bengal.

Elsewhere: Nepal; Bangladesh; Myanmar. *IUCN Status:* Not evaluated.

Raorchestes cf. shillongensis (Pillai and Chanda, 1973) (Fig. 10)

Material Examined: 1 ex.
V/A/NERC/ZSI/1269.

Collected from bamboo shrubs, nearby a brook running through the BSI campus. We didn't encounter another bush frog, as we kept looking for more. The collection was a chance encounter. The dorsal marking on the specimens were very faded and not showing distinctive morphological markings. Hence, we have conferred this specimen to the above species. This species was described from Shillong.

Distribution: INDIA: Meghalaya & Mizoram.

Elsewhere: Not known. *IUCN Status:* Critically endangered.

Rhacophorus bipunctatus (Ahl, 1927) (Fig. 11)

Material Examined: Nil. No specimen was collected. Photography was done.

The most abundant tree frog in the Khasi Hills region, which is also its type locality. The laterally placed black spots and the green dorsum are the distinguishing characters of this species.

Distribution: INDIA: Assam, Manipur, Meghalaya, Nagaland, Tripura & Arunachal Pradesh.

Elsewhere: Bangladesh; China; Laos; Vietnam; Cambodia; Myanmar; Malaya; Thailand.

IUCN Status: Least Concern.

DISCUSSION

The current study records 10 species of anuran amphibians belonging to 8 genera and 4 families, from the Experimental Botanic Garden of the Botanical Survey of India, Umiam, Meghalaya. A good diversity of tree

frogs was also observed. The most abundant frog was *Clinotarsus alticola* whose calls keep the entire forest alive. Of the 10 species, 2 species (*Raorchestes* cf. *shillongensis* and *Rhacophorus bipunctatus*) have their type localities in Meghalaya, whereas the rest were described from elsewhere.

The IUCN status (Anonymous, 2016) of the studied species were ascertained and mentioned under respective species. Among the lot, 8 species are least concern, while 1 species is not evaluated. *Raorchestes shillongensis* is, however, a critically endangered frog.

Predominantly being an Experimental Botanic Garden, the 25 acre area has been able to maintain a healthy and sustainable ecosystem. The different varieties of bamboos, orchids, ferns, climbers, herbs, shrubs and woody trees are available in the campus. The fast encroachment of human habitations around this area has made it the only pocket of diverse plant species which makes it a suitable refuge for diverse fauna as well. As of now, there is no threat to this pocket of forest, or to its fauna.

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Fig.1: Vegetation of study area (BSI Umiam Campus, Meghalaya)



Fig.2: *Duttaphrynus melanostictus*



Fig.3: *Fejervarya pierrei*



Fig.4: *Fejervarya syhadrensis*



Fig.5: *Clinotarsus alticola*



Fig.6: *Hylarana leptoglossa*



Fig.7: *Odorrana chloronata*



Fig.8: *Polypedates maculatus*



Fig.9: *Polypedates teraiensis*



Fig.10: *Raorchestes shillongensis*



Fig.11: *Rhacophorus bipunctatus*