



Status and diversity of anurans (Anuran: Frogs and Toads) in Barkatullah University Campus, Bhopal, Madhya Pradesh, Central India

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Abstract

A survey was conducted during monsoon season of 2015 to know the status and diversity of anurans at Barkatullah University Campus. Seven species of anurans belonging to 3 families (Bufonidae, Dicroglossidae, and Microhylidae) were recorded during the study period. Family Dicroglossidae contributed maximum number of species (5 species) in comparison to family Microhylidae and Bufonidae (1 species each). *Bufo melanostictus* and *Fejervarya limnocharis* were mostly sighted on the whole campus in comparison to rarely sighted *Sphaerotheca breviceps* of family Dicroglossidae. Among toads *Bufo melanostictus* was frequently observed. Mortality due to anthropogenic pressure (primarily vehicular killings) has been found to be the main threat for these species. Present investigation emphasizes conduction of mass awareness programs regarding the conservation of these species.

Keywords: anurans, Diversity, Barkatullah University Campus, Bhopal, Madhya Pradesh

Introduction

Anurans represented by around 6714 species belonging to 55 families all over the world according to Amphibia web (amphibiaweb.org/list/index.shtml).

Though anurans are poikilotherms in nature yet they inhabit a wide range of habitats, both aquatic and terrestrial while mostly they are terrestrial (fossorial or arboreal).

Thus, anurans are proficient of living on land as well as in water while their larval phase is completely aquatic. Amphibians are important constituent of earth's ecosystem and there are several ways by which they are beneficial to environment. Perhaps the most obvious is their role as predator and prey in food web. They also act as bio indicators of environmental health in their habitat.

Dinesh *et al.*, (2015) have enlisted 384 species of amphibians comprising 344 anuran species, 38 species of Gymnophiona and 1 salamander species from India whereas, Chandra and Gajbe (2005) reported 18 species of anurans which belonged to 4 families from different parts of the Madhya Pradesh state. In Bhopal very little attention have been paid towards amphibian fauna therefore it was worthy to initiate the present work to know the current status and diversity of amphibian fauna in this part of state to carry out further studies on their ecology and conservation. Earlier 13 species of frogs belonging to 15 genera and 5 families have been documented by Napit (2012) while working on physico-chemical parameters and amphibians fauna (anurans) of Bhopal in recent studies.

Study Area

The present assessment was conducted at Barkatullah University campus (Figure 1) Bhopal lying within 23° 14' 01"

N and 77° 23' 36' 'E with an average elevation of 527 m.asl. The campus of Barkatullah university has an area of 1.5 km² (360 acres) situated on the national highway 12 which passes through Bhopal. It is a residential type campus. A number of ponds, pools and ditches are present inside the campus. The climate observed here is humid subtropical with hot summer and a humid monsoon season. Here summer start in the late March and go on till mid-June, the average temperature is around 28-30° C, with the peak of summer in May, when it regularly exceed 40°C while monsoon starts in late June and ends in late September.



Fig 1: Barkatullah University Campus (MP)

Methods

The present study was conducted from November 2014 to August 2015 at Barkatullah university campus. The study on live anuran specimens was carried out to know their diversity and current status in Barkatullah University campus Bhopal.

No specimen were harmed during the study nor collected. Field observations were carried out by visual survey method in morning (5.30 am to 7:30 am) and evening time (7:30 pm to 9:00 pm). Night time observations of anurans have also been carried sometimes especially during monsoon months. The whole study area was thoroughly surveyed following visual survey method. The anurans that were observed more than 50 times were considered very common and are denoted as (VC); common (C) which were sighted 30–40 times; fairly common (FC) were sighted 15–25 times and rare (R) which were observed 1–5 times.

The specimens were identified refereeing the field guide books of Daniels (2002).

Results & Discussion

Seven species of amphibians (Table 1) belonging to 3 families were recorded from Barkatullah university campus during the current study period. Among the 07 species of anurans (72%) species belonged to the family Dicoglossidae (14%) each to family Microhylidae and Bufonidae. Species-wise distribution of the anurans species of Barkatullah university campus is

given in (Fig.2).

Family Dicoglossidae contributed 5 species while family Bufonidae and Microhylidae was represented by 1 species each. (Table.1).

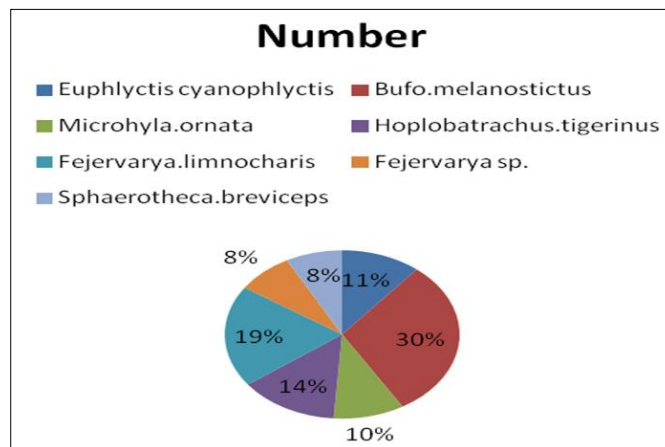


Fig 2

Table 1: Amphibian species sighted in 2014 & 2015 at Barkatullah University Campus.

S. No	Family	Scientific Name	Common Name	Common Status	IUPAC
1.	Dicoglossidae	<i>Euphlyctis cyanophlyctis</i>	Skittering frog	FC	LR-lc
2.	Dicoglossidae	<i>Fejervarya limnocharis</i>	Indian cricket frog	VC	LR-lc
3.	Dicoglossidae	<i>Fejervarya sp.</i>	----	R	LR-lc
4.	Dicoglossidae	<i>Sphaerotheca breviceps</i>	Burrowing frog	R	LR-lc
5.	Dicoglossidae	<i>Hoplobatrachus tigerinus</i>	Indus valley bull frog	C	LR-lc
6.	Bufonidae	<i>Bufo melanostictus</i>	Common Indian toad	VC	LR-lc
7.	Microhylidae	<i>Microhyla ornata</i>	Ornate narrow mouthed frog	FC	LR-lc

Note: VC =Very common; FC= Fairly Common; C=Common; R=Rare
IUCN Status: LR-lc= Lower Risk least concern.

Amphibians the bio indicators are decreasing at an enormous rate. The decline in amphibian population is a major concern throughout the world. The cause of anuran decline shows both spatial and temporal variation. Some are the causes are increased exposure to UV-B radiation, impact of urbanization, habitat destruction, pollution and specimen killing besides fungal diseases Gupta (1975). As amphibian inhabits both terrestrial and aquatic habitats, a change in either or both the ecosystems can lead to a catastrophic effect in amphibian diversity.

The present study area is under various degrees of anthropogenic stress like destruction of habitats by cutting vegetation for making building, vehicular movements etc, which are affecting the anuran species, number of toads were killed on roads by vehicular traffic which threatened toads on the campus. Besides, this the clearance of ground vegetation before monsoon disturb the natural habitat of these creatures and become prone to predation.

It has been found that out of eighteen anurans recorded from Madhya Pradesh only seven species were recorded from the university campus.

In the present investigation two species viz., *Fejervarya limnocharis*, and *Bufo melanostictus* of anurans observed frequently and have been classified as very common (VC); species *Hoplobatrachus tigerinus* has been classified as common (C); two species *Euphlyctis cyanophlyctis* and

Microhyla ornata as fairly common (FC) and another two species *Fejervarya sp.* and *Sphaerotheca breviceps* as rare (R).The percentage contribution of each species is given in Fig 2.

During the survey it was found that *F.limnocharis*, *H. tigerinus* and *F. sp.* live in close association and share common places and these species were spotted mostly during monsoons while *E.cyanophlyctis* was found mostly near pools and ponds, individuals of *M.ornata* were found close to areas having lot of litter or raw material for construction purpose, *B.melanostictus* was found mostly near human dwellings and roads.

Because of their ectothermic nature (require optimum heat for their normal metabolic activity) maximum sighting of anurans was observed in monsoon months (from Mid-June to August, within atmospheric temperature range of 18-30 °C). That is the main reason why these animals were not sighted during the summer (when atmospheric temperature was very high, > 40 °C) and winter (when atmospheric temperature falls drastically >15 °C)

On account of rampant development due to population growth the habitat of anurans is drastically changing leading to stressed conditions for the overall growth and proliferation of anurans at Barkatullah University Campus. Looking to the dwindling population of anurans there is an urgent need to sensitize the population on campus regarding the usefulness of

anurans so that they can be conserved for posterity.

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