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Diversity and Feeding Behavior of Toads (Amphibia: Anura) in District Abbottabad Khyber Paktunkhwa, Pakistan

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Abstract

Geographically Pakistan is distinctive country harboring two zoogeographical regions which are provided with 15 types of habitats. Nine amphibian species are endemic to Pakistan. Despite this richness, there is lack of knowledge regarding diversity of amphibians as very few species have been thoroughly studied and very small area has been explored. This has led to the uncertainties regarding distribution of amphibians in the country. Furthermore, distribution ranges of amphibians have been changed and systemized survey work is required to update baseline information in the country. Diversity of Toads (Amphibia: Anura) among amphibians is great, inhabiting different type of ecosystems. Toads are most important and common in distribution. Therefore, biodiversity of toads has been studied from district Abbottabad, Pakistan. In all, six species of toads have been reported from this region. They have tremendous potential for control of insect pests. Their diversity and role in biological pest control have been studied in this paper.

Keywords: Toad's diversity; Feeding behavior; Abbottabad

Introduction

Geographically Pakistan is distinctive, and country harbors two zoogeographical regions which are provided with 15 habitat types. Nine amphibian species are endemic to Pakistan. Despite this richness, there is paucity of knowledge regarding diversity of amphibians as very few species have been thoroughly studied and very small area has been explored. This has led to the uncertainties regarding distribution and taxonomy of these taxa in the country. Amphibians, the ancestors of modern reptiles and mammals, first evolved in Devonian era and flourished throughout Carboniferous period. This unique group of kingdoms animalia provides an evolutionary link between aquatic and terrestrial mode of life [1]. Amphibians are represented by about 7481. Most diverse clade representing class Amphibia is the order Anura numbering almost 6577 species. Amphibian fauna is scarce in Pakistan. The only clade representing amphibian fauna in the geographical boundaries of Pakistan is Anura with a heterogenous assemblage of twenty-one species. These species fall in twelve genera of four major families viz., Bufonidae, Megophryidae, Microhylidae and Dicroglossidae [2]. The distribution of amphibian fauna in Pakistan elevates from sea level reaching up to 4000 meters in the Himalayas and Karakoram, stretching across the latitude from Indian boundary to its western borders [3].

Materials and Methods

This study was carried out in district Abbottabad of Khyber Pakhtunkhwa province. In this study different methods were used to find out the diversity of toads, i.e. spot observation and by time being collecting toads from study spots of district Abbottabad. Through spot observations, feeding potential of toads was also studied. Insect feeding potential was studied in the laboratory (27±1oC, 65-70% RH and 12 hr. photoperiod) by caging individual toads in glass cages of size 25 x 25 x 25 cm and providing 15 insects every time of each type for 12 hours. The experiment was replicated for 25 times. After experiments and series of observations toads were released from which they were collected. The toads and insects were identified by consulting literature cited in references.

Results and Discussion

Results are recorded in (Table 1). In all, six species of toads have been reported from district Abbottabad. Their utility in

biological control of insects may encourage colonization of toads in natural ecosystems. Almost every species of bufonidae family reported from Abbottabad district have tremendous importance. Therefore, they should utilize in biological insect pest management as ecofriendly approach. Our studies reported two genus Duttaphrynus and Bufotes belong to family Bufonidae, which are the two widely distributed genera of toads in Pakistan consistion of Bufo himalayanus, Bufotes pseudoraddei, Bufo viridis Duttaphrynus stomaticus, Duttaphrynus olivaceous, and Duttaphrynushazarensis. Almost every Bufo species showed tremendous potential for feeding on various types of insect pests (Table 1). All these species feed upon the light attracted insects and pond vegetation etc. Duttaphrynus stomaticus was in great abundance in Abbottabad district of Khyber Pakhtunkhwa province. Duttaphrynus himalayanus is widely distributed throughout the Himalayan Mountains and has been reported in the neighboring countries including China and India as well. Begum et al. [4] conducted a survey in the province Sindh during 2010 through 2013 and reported seven species of amphibians representing two toad species B [5]. stomaticus and Bufo melanostictus. Rais et al. [6] carried out research in in the selected areas of districts Rawalpindi, Islamabad and Chakwal, north Punjab from February 2010 to January 2011 reported five amphibian species representing four genera and three families.

Table 1: Diversity of toads in district Abbottabad.

Order	Family	Genus	Species	Common Name	Feeding
Anura	*Bufonidae*	*Bufo*	*Bufo himalayanus*	Himalayan Toad	grasshoppers, ants
		Bufotes	*Bufotes pseudoraddei*	green toad	pond vegetation, detritus
		Duttaphrynus	*Duttaphrynus stomaticus*	marbled toad.	insects' larvae, cockroaches, ants, mosquitoes, spiders
		Duttaphrynus	*Duttaphrynus olivaceous*	Makran toad	algal vegetation, moths, spiders
		Duttaphrynus	*Duttaphrynushazarensis*	hazara toad	Bettles, Moths
		Bufo	*Bufo viridis*	green toad	light attracted insects

Conclusion and Recommendation

The data of amphibian species in Pakistan needs to be updated by exploration and application of modern Amphibians are important members of food chains and play important role in maintenance of ecosystem. However, in Pakistan the literacy rate is not appreciable, and misconceptions leading these creatures toward extension. The scientific community has no as such attention toward the conservation of these species.

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