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### **Full Length Research Article**

## **STUDY OF AMPHIBIA FAUNA OF BUNDELKHAND REGION WITH SPECIAL REFERENCE TO DAMOH DISTRICT**

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#### **ABSTRACT**

The pollutants and drastic environmental variation have also adversely effected and changed water qualities i.e. colour, hardness, turbidity, alkalinity, pH. COD, BOD and TDS etc. Aquatic life, thus, also is affected. Changes in morphology of amphibian, like-colour, pigmentation, length, weight mass, etc. may occur. This cannot be ignored that the afore-mention variation may be responsible to develop new varieties or sub species. Unfortunately, negligible work is done in relation to amphibian fauna of the area in recent-past. Though, appreciable limnological work is done, yet the amphibian fauna remained unexplored. The fauna study is of tremendous significance in determining population density and calculating sub specific diversity and conservation of ecosystem in Damoh District.

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#### **INTRODUCTION**

The Bundelkhand region of north India is encompassed by two states, i.e., M.P. and U.P. Its greater part falls in M.P. covering 5 district viz, Damoh, Sagar, Chhatarpur, Tikamgarh and Panna. Its terrain being rocky has reduced water level, and due to this, the area has much irrigation potentiality. With a view to meet this demand of the region M.P. state irrigation department is giving greater importance to the development of irrigation projects in Bundelkhand region. Accordingly, many major, medium and minor irrigation reservoirs are constructed. Rajnagar lake, Ponds and river's (Kopra, Sunar and Viyarma), are located in Damoh district of M.P. The entire surrounding of the water bodies is covered by deciduous forest. A sparsely bushy Jungle also exists at the basin of he reservoirs. Although, the district is rich in having natural water bodies, like lake, Ponds, reservoir and rivers. Very scanty work is available on the fresh water, amphibian fauna. These water bodies are main source of water supply, which is utilized for drinking, bathing, washing etc. But now a days, these water bodies are highly polluted due to the Industrial effluents, insecticides, herbicides, weedicides, fungicides and other human activities, Nitrate, Calcium chloride and non soluble Phosphate have increased to alarming level and decomposition

of excessive bloom releases the methane and ammonia gases in water. Study of biodiversity of amphibian fauna and their identification, is one of the interesting field of biological research, which gives us an idea a but the morphological variation and population diversity of fauna in polluted and non polluted site of any particular habitat. Soni and Bais; (1986) Thakur and Sharma; (1986), Swant and Yazdani (1976), and Daniel and Ghate; (1996), did limnological work on Sagar-Damoh, water bodies and reported some physical and chemical components, Jhingran (1985), described the morphological variation and population density of fish in Bangladesh and Andhra Pradesh, and P.K. Rath and Pant; (1979), reported distribution of fresh water fishes in Madhya Pradesh, but nobody has paid any attention to their correlation with the amphibian fauna.

#### **MATERIAL AND METHODS**

The water samples were collected during July 2011 to June 2012. The Method of water analysis would be adopted as per APHA standard method. Eleven Physico-chemical parameters were analyzed and Amphibian were grouped accordingly. Amphibian, collected seasonally, from all polluted and non polluted selected sites by hand picking or fishing nets and would be preserved in 5-10% formaldehyde in glass or plastic bottle. Authentic keys for identification and classification of amphibian, would be used. The key for identification of

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amphibian is available in ZSI Jabalpur and Calcutta would be taken. Boulenger; G.A. (1990), the amphibian fauna of British India. Annandale; N. (1918); S.K. Dutta; (1997); etc would be sought for amphibian identification.

## RESULTS AND DISCUSSION

The present investigation is planned to emphasize, the correlation of physico-chemical component with fresh water amphibian fauna of Damoh. Efforts would be made to find out the factors relating with the decline or increase in the biodiversity, for morphological variations and populations density. Because of pollution, human invasion and production of selective many species of amphibian has fallen to alarming level, because of this also the biodiversity of this region has become unaffordable. The study will provide information of water pollution and morphological variation with population density of amphibian fauna. The population density of amphibian, may help to know about the species which may be endangered, or at the verge of extinction in the locality.

and *B. peltocephalus* is perhaps the next common member, *B. melonostictus* and *B. viridis* was found in the six collection sites, but *B. bufo* and *B. peltocephalus* was collected only four localities except the ever-green forest patch near water bodies. It was a commonly encountered species and showed high relative abundance near human habitation. *Hyla arborea*, the Malabar Gliding Frog, was fairly well distributed in the study area. Most of these were observed on bamboo stems or leaves. *H. arborea* was described by Jerdon (1870), from Malabar, based on a single specimen. During the present study, several individuals were observed in most deciduous forest in Veerangana Ranidurgabati Sanctuary Singorgarh, with the onset of monsoon. Most of them were in amplexus. Microhylidae frog, *Ramanella montana* showed restricted distribution and was found only in site, in a temporary water pool formed during the rainy season. The species showed repeated occurrence in the same area for two years during our study. Another microhylid, *Kaloula taprobanica*, *Microhyla rubra*, *microhyla ornata*, *Uperodon globulosus* and *Uperodon systoma* etc. was found in patchy distribution in sites.

**Table 1. Physical Features (mean value)**

S. No	Name of the Water Body	Water temperature (°C)	Colour (Pt. Co. Unit)	Turbidity (FAU)	TDS (mg/l)
1	Rajnar Lake	20.8	12	7	128
2	Purena Pond	19.8	38	12	139
3	Kopra River	20.6	52	22	156
4	Sunar River	21.1	58	21	188.6
5	Viyarma River	21.7	54	18	178.6

**Table 2. Chemical Features (mean value)**

S. No	Name of the Water Body	DO (mg/l)	BOD (mg/l)	COD (mg/l)	Total Alkalinity (mg/l)	pH	Nitrate (mg/l)	Orthophosphate (mg/l)
1	Rajnar Lake	8.8	12	42	122	8.2	1.234	0.78
2	Purena Pond	16.4	12	102	132	7.8	2.778	6.45
3	Kopra River	12.4	28	112	148	7.1	5.664	16.56
4	Sunar River	10.6	12.8	44	178	8.1	3.1.12	8.89
5	Viyarma River	10.2	22.8	78	164	8.4	4.114	7.89

### Amphibian Fauna Diversity

The decline in amphibian population is a major concern throughout the world. The causes of catastrophic decline vary and include diseases, increased exposure to UV-B radiation, impact of urbanization, habitat destruction, pollution and specimen hunting. As amphibian inhabit both terrestrial and aquatic habitats, a change in either or both the ecosystem can lead to a catastrophic effect in amphibian diversity. Thus, the widespread approach of surveys and preparation of checklist should be combined with quantitative estimates so as to devise potential conservation measures. As a result of the extensive survey of the study area since from July 2011 to June 2012. I documented the presence of 27 species of frogs belonging to 15 genera and 5 families. Family Ranidae was the most dominant with 61% of the total anuran species. Microhylidae is the next contributing 26%, while Bufonidae, Hylidae and Rhacophoridae, contributed to 9%, 2% and 2% respectively. Though Ranidae contributes only 61% of the total anuran species, its abundance is high. The listed frogs includes *bush frogs*, *tree frogs*, *torrent frogs*, *fossorial frogs*, *aquatic frogs* and *frogs* of semi-arid areas. From the total area that I scanned, some frog species were distributed all over the study area, while others were found only in restricted patches. Species of Bufonidae, overall, seem to be doing well. *Bufo melonostictus* and *B. viridis* is very common, while *B. bufo*

Its occurrence was mostly rare and occasional. Family Ranidae contributed 15 species and was widespread in the study area. *Hydrophylax malabarica* and *Limnonectes limnocharis* showed restricted distribution confined to the evergreen forest patches. *Fejervarya keralensis* was found rarely and only one specimen were collected and preserved. *Fejervarya limnocharis* and *Tomopterna rufescens* showed patchy distribution, while *Euphyctis hexadactylus*, *Euphyctis cyanophlyctis*, *Fejervarya syhadrensis*, *Haplobatrachus tigrinus*, *Haplobatrachus cressus*, *Indirana leitheii*, *Rana amurensis*, *Rana esculenta*, *Rana nigromaculata* and *Tomopterna breviceps* showed widespread occurrence and were relatively more common than the other species. Tree frog belonging to the family Rhacophoridae were mainly found in evergreen forest patch. However, common species *polypedates maculates* showed patchy distribution even in other locations in the study area. Our preliminary study depicts three major patterns of amphibian distribution in our study area. Out of total 27 species, nine species were restricted to a maximum of five localities, while another five species showed patchy distribution in three to ten localities within the study area. The remaining 13 species showed more or less continuous distribution, though their abundance levels varied from locality to locality. Since many Frog species are particular to their habitats. They will be under threat if such habitats are lost. One such example encountered recently is the

loss of *R. montana* and *F. keralensis* from site. The typical habitat, where a loud chorus of large population of *R. montana* could be heard, has perished due to the road widening for a state highway.

### Conclusion

Though I have done hard efforts to collect and identify the amphibians of this locality. Still I feel like there is a big gap in study of biodiversity of this region. Feeding and reproduction behavioural study of many such animals are still to be done. Many morphological changes occur in males and female which will help other biologists. The depleting population of many species of the groups studied is very alarming and to prevent further loss of species it is the need of the time to awaken the villagers, tribal and citizens.

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