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STUDY OF BIODIVERSITY OF ANURANS OF GANDIPHALI AND GODLYAHEDI, TEHSIL LADPURA, DISTRICT KOTA, RAJASTHA, INDIA

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ABSTRACT

Gandiphali, located at 25°5'10" and 25°4'21"N latitude and 76°0'24" and 76°0'18"E longitude, and Godlyahedi (25°7'50" and 25°8'29"N latitude and 76°1'10" and 76°1'29"E longitude) are both medium-sized villages located in Ladpura Tehsil of Kota district, Rajasthan, both about 20 km from Kota, to the east of Gandiphali and northeast of Godlyahedi. Both villages are rich in biodiversity, including a diverse range of flora and fauna as well as a significant variety of anurans.

The study is carried out from September 2018 to June 2024, and by the observation, knowledge is gained about identifying the species of anurans. The direct sighting method is used for getting evidence of the species of frogs and toads in the area; the field observation and data are collected weekly with the help of a high-quality camera and other supporting equipment, and we capture the photos and videos. sonotaxonomy of anurans to identify the species based on the recorded sounds, with the help of the key of anurans and the BNHS book and research papers. Visual Encounter Surveys During the rainy season in field wells and wetlands, it was found that there are a total of 11 anuran species belonging to 03 families and 06 genera and 1 anuran species unidentify. Most of the found members belong to the family Dicroglossidae (04 genera and 08 species), which represents the first position among Bufonidae and Microhylidae.

The study is based on conservation strategies for the near future to protect the anurans and observation of the anurans in both areas. The study also suggests protecting the area belonging to the anurans.

Key words— Anurans, biodiversity, identification

1. INTRODUCTION

A branch of herpetology is called batrachology. The study of amphibians is what it is. The phylum Chordata includes a major class of vertebrates known as Amphibia. India's diverse amphibian (caecilian, salamander, and anuran) fauna is important to the health of ecosystems, particularly because they consume pest insects and have therapeutic uses (Dinesh et al. 2009; Tseng et al. 2010). According to Kopal (2001), there are three orders of amphibians: apoda, urodela, and anura. Of the three extant amphibian orders, the anuran order is the most varied and ubiquitous. A recent checklist represents a total of 454 amphibians (K. P. Dinesh et al., 2023). Anurans in general are voracious feeders.

They take mainly insects like butterflies, bugs, beetles, termites, flies, grasshoppers, moths, earwigs, dragonflies, damselflies, and also their larvae, etc. The amphibians in Sitamata WLS have been studied by [Kumar et al., 2014], whereas the many facets of amphibians in Rajasthan have been studied by [Sharma, 1995a, 1995b] and [Sharma et al., 2008]. While [Sharma, 2008] reported 12 amphibian species from the entire state of Rajasthan, [Mansukhani and Murthy, 1964] recorded 8 species from Rajasthan. An investigation into frogs and toads in sequence: In rural areas of Gandiphali and Godlyahedi, both villages in Ladpura Tehsil, Kota District, Rajasthan, India, Anura, a class of amphibia, was found in ponds, water bodies, grasslands, wetland areas, canals, water dunes, fields and paddy fields, wells, and the vicinity of wells.

2. MATERIALS AND METHODS

2.1 Study Area

Gandiphali, located at 25°5'11" and 25°4'21"N latitude and 76°0'24" and 76°0'18"E longitude, and Godlyahedi (25°7'50" and 25°8'29"N latitude and 76°1'10" and 76°1'29"E Longitude) are both medium-sized villages located in Ladpura Tehsil of Kota district, Rajasthan, Both about 20 km from Kota, to the east of Gandiphali and northeast of Godlyahedi.

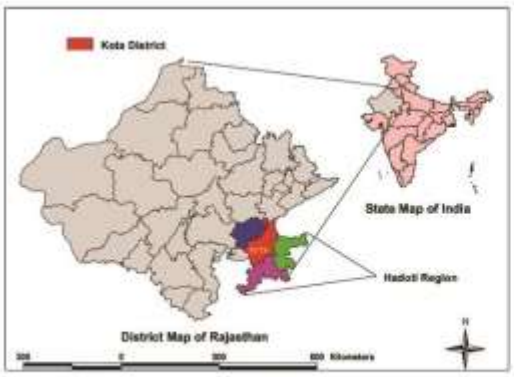

Fig.- 1: Map representing the districts of Kota Region in Rajasthan state of India

Fig.-2 : Map representing the Study Area – Kota District of Rajasthan state of India

Figure 3 Study Site Godlyahedi, Tehsil Ladpura, district Kota, Rajasthan

Figure 4 – Study Site Gandiphali Tehsil Ladpura, district Kota, Rajasthan

2.2 Methodology

The study and fieldwork were conducted from September 2018 to June 2024.The survey of frog and toad was made at evening-night, The survey of anurans was made at night, between 6.30pm and 10.30pm, thrice a week during the the Month of Sep10.00pm, thrice a week during the months of Sep. 2018 to June 2024. To record the species of anurans, random surveys were carried out in and around the study region.

Visible characters, habits, and habitat were used in the identification of the anuran species. Some important methods have been used for this study, in which the VES (visual encounter survey) and PVR (photography, videography, and recording) methods were specially used. For photography, the Nikon Coolpix 900, a mobile camera, a macro camera, and the Nikon DSLR camera were used; for videography, a mobile camera and the Sony 4K video were used; and for recording, the Mobile Voice Recorder, the microphone Mic BOYA, and the microphone Protonics Dash 7 were used. For the observation, other tools like a torch, a tripod, and a monopod were also utilised. Humidity and temperature were also noted. The identification of species was mainly based on using standard diagnostic keys (Noulenger,1890; Smith,1943; Dutta, 1992; Kuramoto & Joshy, 2001; Chanda, 2002; Daniel, 2002; Daniel, 2005; Kuramoto et al., 2007) and use sonotaxonomy (call characteristics for identification and categorization).

3. RESULTS AND DISCUSSION

The study found a total of 11 anuran species belonging to 03 families and 06 genera and one unidentified species (Table 1, 2) (Plate 1). Every amphibian that was discovered is a member of the Anura order. Dicroglossidae was the most speciose family of frogs. There are eight species in the Dicroglossidae family, two in the Bufonidae family, one in the Microhylidae family, and one in an unspecified family. ABBREVIATION Current Status MC, CO, NC, RA, - Most common; Common; not common; rare. Population trend categorized 1. Stable 2. Decline 3. Sharply decline and IUCN status, (Table 2)

Table A. List of Anurans from study area Gandiphali and Godlyahedi, Tehsil ladpura, District Kota, Rajasthan.

S.N.	Class	Order	family	Genus	species	Common name
01	Amphibia	Anura	Bufonidae	*Duttaphrynus*	*melanostictus*	Common Indian Toad
02	Amphibia	Anura	Bufonidae	*Duttaphrynus*	*stomaticus*	Marbled Toad
03	Amphibia	Anura	Dicroglossidae	*Hoplobatrachus*	*tigerinus*	Indian Bull Frog
04	Amphibia	Anura	Dicroglossidae	*Euphlyctis*	*cynophlyctis*	Skittering Frog
05	Amphibia	Anura	Dicroglossidae	*Fejervarya*	*caperata*	Wrinkled Fejervarya
06	Amphibia	Anura	Dicroglossidae	*Fejervarya*	*granosa*	Granular Fejervarya
07	Amphibia	Anura	Dicroglossidae	*Fejervarya*	*limnocharis*	Indian cricket frog
08	Amphibia	Anura	Dicroglossidae	*Sphaerotheca*	*rolendae*	Roland's burrowing Frog
09	Amphibia	Anura	Dicroglossidae	*Sphaerotheca*	*breviceps*	Indian burrowing frog
10	Amphibia	Anura	Dicroglossidae	*Sphaerotheca*	*pashchima*	Western burrowing Frog
11	Amphibia	Anura	Microhylidae	*Microhyla*	*ornata*	Ornate narrow-mouthed Frog
12	Amphibia	Anura	Unidentified	Unidentified	Unidentified	Toad

List B. Anurans of Gandiphali and Godlyahedi: Call Characteristics, Current Status, Population Trend, and IUCN Status.

S.N.	**Scientific name**	**Call Characteristics**	**Current Status**	**Population Trend**	**IUCN Status**
01	*Duttaphrynus melanostictus* (Schneider,1799)	`creo-o-o-o´, `cro-roro-ro …, cro-.....'	MC	Stable	LC
02	*Duttaphrynus stomaticus* (Lutken,1862)	`cre-cre-crecrec.....´	MC	Stable	LC

03	*Hoplobatrachus tigerinus* (Daudin,1802)	Loud low-pitched sound `boong-boongboong	CO	Decling	LC
04	*Euphlyctis cynophlyctis* (Schneider,1799)	Distinct `turr-rrrrrr-rrr trrr-rrr-rrr´	MC	Stable	LC
05	*Fejervarya caperata* (Kuramoto,Joshy,Kurabayashi, and Sumida,(2008)	.....	CO	Declining	DD
06	*Fejervarya granosa* (Kuramoto,Joshy,Kurabayashi, and Sumida,(2007)	.....	NC	Declining	DD
07	*Fejervarya limnocharis* (Gravenhorst 1829)	In quick succession `creakcreak-creak.....´	MC	Stable	LC
08	*Sphaerotheca rolendae* (Dubois,1983)	Sharp `brreee....brreeee....brreeee....´	RA	Sharply Declining	LC
09	*Sphaerotheca breviceps* (Schneider,1799)	Loud `bawng-bawng-bawng´	RA	Declining	LC
10	*Sphaerotheca pashchima* (Padhye, Dahanukar, Sulake, Danedekar, Limaye & Jamdade 2017)	.....	RA	Declining	DD
11	*Microhyla ornate* (Dumeril & Bibron,1841)	Long `trrrrk-trrrrk-trrrrk´	CO	Stable	LC
12	Unidentified	....	RA	Declining	NA

Duttaphrynus melanostictus

Duttaphrynus stomaticus

Hoplobatrachus tigerinus

		
Euphlyctis cynophlyctis	*Fejervarya caperata*	*Fejervarya granosa*
		
Fejervarya limnocharis	*Sphaerotheca rolendae*	*Sphaerotheca breviceps*
		
Sphaerotheca pashchima	*Microhyla ornata*	Unidentified Toad

Plate 1 – Anuran of Gandiphali and godlyahedi, Tehsil Ladpura, District Kota,Rajasthan

4. CONCLUSION

The observations and data collected in this study will be advantageous to students, researchers, and nature lovers in the future. As there is no data available about anuran biodiversity from Gandiphali and Godlyahedi,Tehsil Ladpura, District Kota, Rajasthan. Therefore, this may be the first preliminary study report of Gandiphali and Godlyahedi, Tehsil Ladpura, District Kota, Rajasthan. Anurans are an important indicator of the biological health of an ecosystem. To educate people about anurans and their significance for a healthy ecosystem, awareness campaigns must be held. Since ignorance was the primary cause of their extinction, our study recommends raising awareness of the importance of anurans to the ecosystem.

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REFERENCE

Banyal, H.S. & Kumar, S. (2017) "A Perspective on Anuran Diversity of Western Rajasthan" J. Env. Bio-Sci., Vol. 31 (2): 331-333.

Boulenger, G.A. (1890)"The book of The Fauna of British India, including Ceylon and Burma, Reptilia and Battrachia, Taylor & Francis, London", xviii+541.

Chanda, S.K. (2002). In: Handbook - Indian Amphibians, 'Zoological Survey of India' in Calcutta.

Daniel, J.C (2002). "The Book of Indian Reptiles and Amphibians", Bombay Natural History Society, 8:236.

Daniels, R.J.R. (2005), Amphibians of Peninsular India. Universities Press, Hyderabad, India, 286.

Dinesh, K.P., Radhakrishnan, C., Channakeshavamurthy, B.H., Kulkarni, N.U. "A check list of Amphibia of India," http://mhadeiresearchcentre.org./resource,Update s till January, 2015 (Online only).

Dinesh, K.P., Radhakrishnan, C., Gururaja, K.V. Deuti, K., Bhatta, G.A., "A Check list of Amphibia of India with IUCN Red list Status," Zoological survey of India, Updated till June, 2011(Online Version).

Dinesh, K.P., Radhakrishnan, C., Gururaja, K.V., Deuti, K., Bhatta, G.A."A Checklist of Amphibia of India with IUCN Red list Status,"Zoological survey of India,Updated till August, 2009 (Online Version).

Dinesh, K.P., Radhakrishnan, C., Gururaja, K.V., Deuti, K., Bhatta, G.A. "A Checklist of Amphibia of India with IUCN Red list Status," Zoological survey of India, Updated till July, 2010 (Online Version).

Dinesh, K.P., Radhakrishnan, C., Gururaja, K.V., Deuti, K., Bhatta, G.A. "A Checklist of Amphibia of India with IUCN Red list Status" Zoological survey of India, Updated till September, 2012 (Online Version).

Dinesh, K.P., Radhakrishnan, C., Gururaja, K.V., Deuti, K., Bhatta, G.A., "A Checklist of Amphibia of India with IUCN Red list Status" Zoological survey of India, Updated till April, 2013 (Online Version).

Dinesh, K.P., Radhakrishnan, C., Gururaja, K.V., Deuti, K., Bhatta, G.A. "A Checklist of Amphibia of India with IUCN Red list Status" Zoological survey of India, Updated till January, 2023 (Online Version).

Duellman,W.E. L, True (1994) Biology of amphibians. Baltimore, MD and London: McGraw-Hill.

Duellman, W.E. &Trueb, L (1986). Biology of amphibians. - McGraw- Hill Book Company, 670 pp.

Dwibedy, SK (2017) " Batrachofauna Diversity of Dhaltangarh Forest of Odisha, India" International Journal Of Recent Scientific Research Vol. 8, pp. 19482-19486.

Gururaja KV, Ramachandra TV (2012). "Anuran Diversity and Distribution in Dandeli Anshi Tiger Reserve" Sahyadri Conservation Series: 8, ENVIS Technical Report 37 Environmental Information System (ENVIS).

J. C. Daniel,(2002)"The book of Indian Reptiles and Amphibians," Bombay Natural History Society, Oxford University Press, Mumbai, pp. 8-238

Khandla, Y. & Trivedi, V. (2018) "A Preliminary Survey on Anurans of Jamnagar City and Vicinity Areas, Gujarat, India" IJSR ISSN: 2319-7064.

Kotpal, R.L.(2001) Vertebrates, Rastogi Publications, Gangotri, Meerut, Chapter 20 and 25.

Kumar, S. & Banyal, H.S. (2016) "Anuran Diversity of Chambal River in the Rajasthan State J. Environment Bio-Science" 2016: Vol. 30 (1): 131-132.

Kumar, Sanjeev (2014). Conservation Area Series 54: 87.

Kuramoto, M. & S.H. Joshy (2001). Advertisements call structures of frogs from southwestern India, with some Ecological and Taxonomic notes. Current Herpetology 20(2): 85-95.

Kuramoto, M., S.H. Joshy, A. Kurabayashi & M. Sumida (2007) "The genus Fejervarya (Anura: Ranidae) in central Western Ghats, India, with descriptions of four new cryptic species. Current Herpetology 26(2): 81-105.

Mansukhani, M.R. and Murthy, T.S.N., (1964). Rec. Zoo. Surv. India, 62 (1 & 2): 51.

Pough, F. H., R. M. Andrews, Cadle, J. E., Crump, M. L., Savitzky,A. H. And Wells, K.D., (2004) Herpetology, Third Edition, Prentice Hall, Upper Saddle River, New Jersey.

Pratihar,S. & Deuti, K.(2011) "Distribution and threats of amphibian species in west Midnapore District, West Bengal, India" Frog leg #17 Pp. 2–8

Sharma, K.K. (2005). Sonotaxonomy: sound based taxonomy is a novel and environment friendly approach in systematics. Journal of Cell and Tissue Research 5(3): 1–2.

Sharma, K.K. (2008). Cobra 50(1): 25.

Sharma, K.K., & P. Dube (2005) Indian Journal of Environmental
Sharma, K.K., N. Sharma & V. Sharma (2010a) "Current status and distribution of anurans from foothills of Aravalli ranges at central Rajasthan, India". Flora and Fauna 16(2): 244–248.
Sharma, K.K., P. Dube, S.N. Khan, S. Ghatak & Y. Bhobharia (2004) "Amphibian biodiversity of some specific ecological condition of Rajasthan and conservation strategies, Management of Aquatic resources for biodiversity maintenance and conservation". Conference held at Jodhpur, Rajasthan (Abstract).
Sharma, S.K. (1995a). Flora and Fauna 1(1): 47.
Sharma, S.K. (1995b). Journal of the Bombay Natural History Society 92(2): 271.
Sharma, S.K. (1999). Some new distribution sites of amphibians in Rajasthan. Froglog III (2):
12.
Sharma, V., Sharma, K.K. & Sharma,N. (2011) "Recent threats and conservation strategies of anurans at central Aravalli foothills of Rajasthan, India" Frog leg #17 Pp. 9–15
Smith, M.A. (1943) "Fauna of British India including Ceylon and Burma, Reptila and Amphibia, Vol. III Serpents" Today and Tomorrow's Printers & Publishers, New Delhi, Indian Reprint (1981), 583.
Tseng, A.S., W.S. Beane, J.M. Lemire, A. Masi, & M. Levin (2010) "Induction of vertebrate regeneration by transient sodium current, Journal of Neuroscience methods" 30: 13192–13200.
Yogesh Khandla, Trivedi, V. (2018) "A Preliminary Survey on Anurans of Jamnagar City and Vicinity Areas, Gujarat, India" International Journal of Science and Research (IJSR) ISSN: 2319-7064.
Zug, G. R., Vitt, L.J. and Caldwell, J. P., (2001). Herpetology: An Introductory Biology of Amphibian sand Reptiles. Second Edition, Academic Press, San Diego.