

Documentation of Snakes in and around Bhadra Reservoir Project area of Karnataka

*T.C. Pushpa

Department of Zoology, Maharani Cluster University,
Palace Road, Bangalore-560001, Karnataka (India)

Abstract

The present study deals with the documentation of snakes in and around Bhadra reservoir project area of Karnataka during 2021-22. A total of 29 species of snakes belonging to 7 families were reported. Of the total identified species, 19 were non-venomous, 6 were venomous and 4 were mildly-venomous. Among the rare species *Ahaetulla pulverulenta*, *Chrysopeleo ornate* and *Macropisthodon plumbicolor* were reported. The family Colubridae was dominates other families and Indian cobra, *Naja naja* is the most rescued snake because peoples believes it as god. Additionally, a lack of awareness of the ecological role that snakes play and a fear of snake bites contributed to the mortality of snakes in residential areas. It is recommended to raise public awareness about the role that snakes play in the ecological food chain and the sustainable use of natural resources. The data presented here can be used as a baseline for determining the status of snakes in the present study area because there are no previous reports available and only few data is available on snakes. Environmental change, human activities and quick natural surroundings corruption have prompted a fast decrease in the number of population of snakes. Subsequently, constant observing of their variety and prosperity is essential.

Key words : Venomous & Non-Venomous snakes, Bhadra reservoir project, Karnataka.

India has around 270 snakes, 9% of the world's 3000 odd kinds of snakes^{25,31}. To fathom the neighborhood species wealth and the dispersions of species in the climate, recording the variety of snakes and other natural life inside distinctive geographic regions is critical. Such inventories should be possible at various spatial scales: in the country

all in all²⁰; state level¹⁰; the level of the territory or area²⁶; or even very confined¹².

Snakes are significant piece of different pecking orders in the environments. The snakes can be found in a wide variety of habitats, including grasslands, wetlands, forests, agricultural fields, scrublands, deserts,

*Associate Professor,

the sea, and areas around residential areas. Rodents, amphibians, birds, mammals, all reptiles, insects, and the young of birds are all preyed upon by the snakes. It demonstrates the diverse food preferences of these creatures. Snakes have been one of nature's most successful vertebrates since ancient times. According to Whitakar and Captain³⁰, the majority of snake species inhabit the arid regions of the globe. Snakes' hibernation and aestivation are well-known traits. They are able to survive for extended periods of time without food, so it is possible. Snakes are supposed to be companions of ranchers since they are normal hunters of unsafe rodents, and bugs in agribusiness fields, however in India the absence of mindfulness among the ranchers and individuals in provincial region many snakes are killed by individuals. A pair of fangs, which are part of the venom apparatus that snakes use to kill their prey, are found in the mouths of venomous snakes. The snake bite occurs as a result of careless work in the fields of agriculture without taking precautions. People all over the world dislike and fear snakes, and a lack of understanding leads to the killing of snakes whenever and wherever they are observed¹⁷.

Snakes play an important role in controlling the rodent pests. Global depletion of snakes and their extinction is a conscientious and diligent task to people of all spheres of the society to conserve them¹⁶. Anukul Nath *et al.*,¹ have reported that snakes have adopted to all kinds of landscapes. Snakes are found in human habitations that is in villages and towns; leading to a serious human-snake conflict. It has been estimated that 20,000 to 40,000 peoples were die per year from snake

bite⁵. Snake populations of are influenced by microhabitat factors such as soil, pH, humidity, leaf litter and woody debris^{6,18}. The study was carried out to collect the baseline information and status of snakes in and around Bhadra Reservoir Project area.

Study area :

Bhadra reservoir project area is situated amidst the Western Ghats in Chikmagaluru districts of Karnataka. The area falls in an almost saucer shaped basin, enclosed within the horse shoe shaped Bababudan Hill Ranges. Bhadra reservoir project area is located between 13°22'N-13°47'N latitudes and 75°29'E-75°47'E longitude, bordering the two districts of Chikmagaluru and Shivamogga.

The shape and colour of the snake, location and different human habitations (inside the house, field, ponds, near forest area, gullies, inside a shop) and dates were noted. Snakes were identified in the field itself by taking photographs and information was gathered from local snake catchers of surrounding areas and forest personnel about the different Snakes by interviewing and showing pictures of the species of them. The places selected for the present study are Singanamane, Chowli camp, KPC, Saddle road, Garage Camp, Kudre shed, Shanthi nagara, Malenahalli, Nellisera, Gonibedu, Tammadihalli, Bhadra Jungle Lodge area and Bhadra reservoir sites. Data was collected by referring books, journals, monographs and web references. Snakes were identified following Daniel⁴, Das⁵ and Whitakar and Captain³⁰.



Figure1: Study area map showing Bhadra reservoir and its surrounding areas

In the present study, a total of 29 species of snakes belonging to 7 families were reported. Of the total identified species, 19 were non-venomous (65.52%), 6 were venomous (20.69 %) and 4 were mildly-venomous (13.79%). Among the rare species *Ahaetulla pulverulenta*, *Chrysopeleo ornate* and *Macropisthodon plumbicolor* were reported. The family Colubridae was dominates other families. Indian cobra is the most rescued snake because peoples believes it as a god.

Table-1 depicts the checklist of snakes in and around Bhadra Reservoir Project area, Karnataka. Figure 3 and 4 shows the venomous status and occurrence of snakes families. However, Figure 5 depicts the status of snakes in Bhadra Reservoir Project area.

Hema Makne⁸ from Dhanlakshmi nagar, Parbhani, compiled a list of snakes. The snakes she captured represented 12 species

in 5 families. 05 of the snakes in these families were venomous, while six were not. Her study was an effort to assess the information regarding species richness and further contribute to the understanding, awareness, and conservation of the region's snake fauna. In the Aurangabad district, 16 species of snakes were identified by Chandrakant Sirsat *et al.*³. Of these, only four were poisonous, two were semi-poisonous, and the remaining ten were non-poisonous.

Kshama and Pawar⁹ detailed an agenda of snakes in and around Lonar Pit edge of Buldhana region, Maharashtra was introduced though based on environment construction and probability of accessibility of the species. They identified a total of 05 families and 16 species. There are 04 poisonous snakes in the Elapidae and Viperidae families, 11 non-poisonous snakes in the Typhlopidae, Colubridae, and Pythonidae families, and one species of snake in the



Figure 2: Poisonous and Non-poisonous snakes of B R P

Colubridae family. All of these snakes are rescued and released into their natural environments.

Pawar *et al.*¹¹ evaluated the impact of over-exploitation of natural resources on the diversity and distribution of snakes in the surrounding areas of Panvel, Navi Mumbai. Their review has 25 types of snakes addressing 10 families and 23 genera out of which 10 species have a place with family Colubridae, 3 species each to Elapidae and Viperidae, 2 species to Erycidae and Natricidae. Six venomous snake species and 19 non-venomous snake species were observed during their study. In the Indapur region of Maharashtra, Rajendra Vishnu Salunkhe¹⁵ recorded 22

species of snakes from four families in 2023. Five venomous, two semi-poisonous, and fifteen non-poisonous species were identified by him.

Seetharamaraju *et al.*,¹⁹ distributed data about rearing way of behaving of striped keelback. Srinivasulu *et al.*,²² found a banded krait from the Warangal district. Srinivasulu *et al.*,²¹ have published the diversity of reptiles in Andhra Pradesh. Seetharamaraju *et al.*¹⁹ distributed data about the dissemination of *Oligodon taeniolatus* in Andhra Pradesh. Sumaithangi *et al.*,²³ have recorded a sum of 105 types of herpetofauna, comprising of 24 land and water proficient species, 35 reptile species, 42 snake species and 4 chelonian

Table-1. Checklist of snakes in around Bhadra Reservoir Project

Sl. No.	Family	Scientific name	Category	Occurrence
1.	Boidae	<i>Eryx johnii</i>	NV	R
2.	Colubridae	<i>Nerodia sipedon</i>	NV	C
3.	Colubridae	<i>Argyrogena fasciolata</i>	NV	R
4.	Colubridae	<i>Boiga beddomei</i>	MV	R
5.	Colubridae	<i>Preocryptophis porphyracea</i>	NV	IF
6.	Colubridae	<i>Dendrelaphis tristis</i>	NV	IF
7.	Colubridae	<i>Coelognathus helena</i>	NV	IF
8.	Colubridae	<i>Oligodon arnesis</i>	NV	IF
9.	Colubridae	<i>Oligodon taeniolatus</i>	NV	IF
10.	Colubridae	<i>Ptyas mucosa</i>	NV	C
11.	Colubridae	<i>Xenochrophis piscator</i>	NV	C
12.	Colubridae	<i>Macropisthodon plumbicolor</i>	NV	R
13.	Colubridae	<i>Chrysopeleo ornate</i>	MV	R
14.	Colubridae	<i>Ahaetulla nasuta</i>	MV	IF
15.	Colubridae	<i>Ahaetulla pulverulenta</i>	MV	R
16.	Colubridae	<i>Lycodon aulicus</i>	NV	IF
17.	Colubridae	<i>Amphiesma stolatum</i>	NV	IF
18.	Colubridae	<i>Sibynophis subpunctatus</i>	NV	IF
19.	Colubridae	<i>Lycodon travancoricus</i>	NV	IF
20.	Colubridae	<i>Hebius beddomei</i>	NV	IF
21.	Elapidae	<i>Bungarus caeruleus</i>	V	IF
22.	Elapidae	<i>Naja naja</i>	V	C
23.	Elapidae	<i>Ophiophagus hannah</i>	V	IF
24.	Pythonidae	<i>Python molurus</i>	NV	IF
25.	Typhlopidae	<i>Ramphotyphlops braminus</i>	NV	IF
26.	Uropeltidae	<i>Uropeltis ellioti</i>	NV	C
27.	Viperidae	<i>Vipera russelii</i>	V	C

species from Eastern ghats of Andhra Pradesh.

The habitat of the animals is being affected by human activities, physical development, civilization, and primarily changing environmental conditions like global warming. As a result, this crucial component of the ecology fights against man. However, it is only natural that

their baffling means of movement, venom, and constricting mechanism have made them a significant group of predators. Their interactions also help to maintain a natural equilibrium in India's forests, deserts, plains, and hills^{3,7,28}.

As paddy fields, village huts, and warehouses provided new opportunities for worms and insects, birds, rats, mice, and other

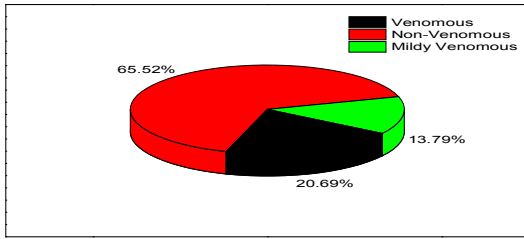


Figure 3: Venomous status of snakes in Bhadra Reservoir Project area

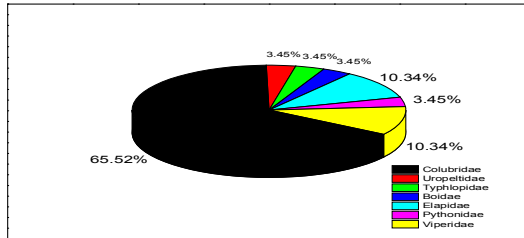


Figure 4 : Occurrence of snakes in families

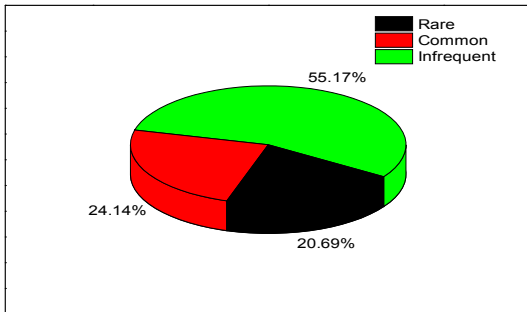


Figure 5 : Status of snakes in Bhadra Reservoir Project area

species, the arrival of humans appears to have increased hunting skills. a significant number of which expanded in the areas because of these territory and safe houses and in this manner are a simple prey for snakes. According to Walmiki *et al.*,²⁷ this expansion and changes in their food supply may have also altered the types and densities of snake populations.

Numerous studies have shown that

certain species of snakes in their habitat are on the verge of becoming extinct, with some being extremely rare. This indicates that diverse habitats are rapidly changing, which is harmful to their biodiversity and habitat. Prasanna Joshi¹³ reported that the abundance of snake fauna is being affected by human activities. It is evident from the number of species found that there are few species of serpent fauna in the degraded forest patch. Indian rock python and Striped keel back are members of the Colubridae and Pythonidae families, respectively¹⁴. As a result, it is essential to carry out systematic research and long-term monitoring on this significant group of animals^{9,29}.

The goal of the study by Sayeswara *et al.*,¹⁸ was to record the snakefauna in and around Shivamogga town. There were a total of 117 snakes saved, 51 of which were found inside the house, followed by 29 found in the courtyard, 5 found in shops, 5 found in tanks and ponds, and 17 found in agricultural fields. There were 21 snake species from 08 families that were recorded. Colubridae dominated the list of the five families with ten species, followed by Elapidae and Natricidae with three species each. Each of the families Viperidae, Pythonidae, Boidae, Uropeltidae, and Typhlopidae had one species. Among 14 snakes 04 poisonous, 02 mildly poisonous, and 04 non-poisonous were captured alive and returned to suitable habitats nearby. There were significantly fewer venomous snakes saved than non-venomous snakes. August saw the most snakes saved, while October saw the fewest. The study areas were reused with rare snakes like *Eryx johnii* and *Argyrogena*

fasciolata. Because of anthropogenic tensions, the quantity of snakes is diminishing pointedly. Public awareness of the significance of snakes to maintaining an equilibrium in the ecosystem is crucial to the conservation of snakes in Shivamogga.

Thirumala and Kiran²⁴ review study deals with the diversity and distribution of snakes in various areas of Karnataka. However, Ashashree and Kiran² have reviewed the diversity and distribution of snakes in Maharashtra and Andhra Pradesh states of India. Additionally, a lack of awareness of the ecological role that snakes play and a fear of snake bites contributed to the mortality of snakes in residential areas. It is recommended to raise public awareness about the role that snakes play in the ecological food chain and the sustainable use of natural resources. The data presented here can be used as a baseline for determining the status of snakes in the adjacent India region because there are no previous reports available and only few data is available on snakes. Environmental change and quick natural surroundings corruption have prompted a fast decrease in the number of population of snakes. Subsequently, constant observing of their variety and prosperity is fundamental.

The present study is an attempt to evaluate the information, occurrence and distribution of snake species in Bhadra Project area of Karnataka. People believe that every snake is poisonous and fail to distinguish between poisonous and non-poisonous snakes, which is why they kill some but not all venomous and non-venomous snakes. The majority of the land is agricultural, which draws

frogs, rodents, and snakes, respectively; Home provides the appropriate climate for snakes to harbor, providing both food and shelter. The month to month/occasional variety is because of harvest rising and furrowing. The majority of the land that farmers cultivate includes paddy, maize, and sugar cane. These crops provide snakes with a favorable habitat, which may account for the highest number of snakes. They plough and clean the land after harvesting, which reduces the number of snakes due to a lack of suitable habitat, which may account for the summer's lowest snake population. Because of human settlements and human overwhelmed region these numbers are diminishing. While safeguarding the snakes, we additionally gave mindfulness about the snakes that how it keeps an eye on the rat populace and how it is environmentally useful. To safeguard the snake populace estimates like, the natural surroundings protection, instruction and effort programs are significant and furthermore to keep away from the human-snake struggle. Because of presence of snake companion in this space individuals show more worry to save the snake as opposed to killing and that demonstrate individuals performance towards the protection of snake.

References :

1. Anukul Nath, Hilloljyoti Singha and Abhijit Das (2011). *Reptile Rap*, 13: 9-13.
2. Ashashree H.M. and B.R. Kiran (2023). *Intern. J. Zool. Invest.* 9(2): 374-383, 2023.
3. Chandrakant V. Sirsat, Meena U. Patil and Vijay Ujiwal, (2016). *Bioscience Discovery*, 7(2): 162-165.
4. Daniel, J.C. (2002). *The Book of Indian*

- Reptiles and Amphibians. Bombay Natural History Society, Oxford University Press, Bombay, India.
5. Das, I. (2002). A Photographic Guide to snakes and other Reptiles of India, New Holland Publication, UK, pp. 144.
 6. Faccio, S. (2001). Biological inventory of amphibians and reptiles at the Marsh-Billings-Rockefeller, National Historical Park and adjacent lands. Technical Report NPS/NER/NRTR-2005-008, National Park Service, Wood Stock, VT.
 7. Harney NV. (2011) *Online International Interdisciplinary Research Journal*, {BiMonthly}, 1(I):
 8. Hema D. Makne (2021). *Journal of Emerging Technologies and Innovative Research Volume 8(12)*: 424-428.
 9. Kshama Khobragade and Vijaykumar B. Pawar (2015). *International Journal of Engineering Science Invention. 4(1)*: 19-21.
 10. Patel, H. and R. Vyas (2019). *Herpetology Notes, 12*: 765–777.
 11. Pawar Prabhakar R., Anil G. Rokade, P. Supnekar Santosh, Leena N., B. Pawar Namdeo and V. Gavhane Usha (2020) *Intern. J. Zool. Invest. 6(2)*: 289-300, <https://doi.org/10.33745/ijzi.2020.v06i02.007>.
 12. Prasad, V.K., A. Verma and G. Shahabuddin (2018). *Journal of Threatened Taxa, 10(2)*: 11295–11302.
 13. Prasanna Joshi (2011), *Golden Research Thoughts, 1(1)*: 1-4.
 14. Raghvendra Nande *et. al.* (2007), *Zoos' Print Journal, 22(12)*: 2920-2924.
 15. Rajendra Vishnu Salunkhe (2023). Snakes of Indapur: Diversity and Awareness. First Edition: March, 2023. Bhumi Publishing, Nigave Khalasa, Kolhapur 416207, Maharashtra, India.
 16. Sahu, K.R., Devaraj Mishra and Soubhagya Pradhan (2014) *International Journal of Research in Zoology, 4(1)*: 6-9.
 17. Sathish Kumar VM. (2012) *REPTILE RAP. 14*: 2-8.
 18. Sayeswara, H.A., E.N. Jeevan, H.M. Ashashree, K.L. Naik and N. Kumara Swamy, (2015). *International Journal of Science and Nature 6(3)* : 2015: 495-500.
 19. Seetharamaraju, M., C. Srinivasulu, and B. Srinivasulu, (2011). *Herpetology Notes, 4*: 421–423.
 20. Smith, H. M. and E. H. Taylor, (1945). An annotated checklist and key to the snakes of Mexico. Bulletin of the United States National Museum.
 21. Srinivasulu, C., B. Srinivasulu, M. Seetharamaraju, R. Sreekar and Harpreet Kaur (2011). *Paryavaranam, 5(3)*: 2–7.
 22. Srinivasulu, C., D. Venkateshwarlu, and M. Seetharamaraju, (2009). *Journal of Threatened Taxa 1(6)*: 353–354.
 23. Sumaithangi Rajagopalan Ganesh and Bubesh Guptha. (2021). *Journal of Animal Diversity 3 (3)*: 18–44.
 24. Thirumala, S and B.R. Kiran (2023). *Indian J. Applied & Pure Bio. 38(3)*: 1285-1292.
 25. Uetz, P., P. Freed, and J. Hošek, (eds.) (2020). The Reptile Database, <http://www.reptile-database.org>, accessed [Accessed 10 March 2021].
 26. Van Pham, A., T. Ziegler and T.Q. Nguyen (2020). New records and an updated checklist of snakes from Son La Province, Vietnam. *Biodiversity Data Journal, 8*.
 27. Walmiki Nitin, Siddhesh Karangutkar, Yengal Bhaskar, Manisha Kayande, Vishal Wagh, Karangutkar Siddhesh, Yengal Bhaskar, Kayande Manisha, Vishal Wagh,

- Rishab Pillai and Dalvi, (2012a). *India Trends in Life Sciences* 1(3): 2.
28. Walmiki N, V Awsare, S Karangutkar, V Wagh, B Yengal, S Salvi and R Pillai, (2012a). *World Journal of Environmental Biosciences*, 1(2): 90-99.
29. Wanje Sudhir *et.al.* (2011). *Indian Journal of Fundamental and Applied Life Sciences*, 1(4): October-December, 93-99.
30. Whitakar, R. and A. Captain, (2004). *Snakes of India- the Field Guide*, Draco Books, Chengalpet, Tamil Nadu, India. pp. 489.
31. Yatin Kalki, Chayant Gonsalves, Daniel B. Wylie, A. K. Karthik Sundaram and D. Tristan Schramer. (2021). *Journal of Animal Diversity* 3(2): 26-41.
32. <https://jlrexplore.com>