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Snake Varieties and Distribution in Maharashtra and Andhra Pradesh States of India: An Overview

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Abstract: The diversity and distribution of snakes in Maharashtra and Andhra Pradesh states of India is reviewed based on published literature by different researchers. The auxiliary information on snake assortment was gathered by referring monographs and journals. 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.

Keywords: Venomous snake, Non-Venomous snake, Reptilia, Diversity

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Introduction

India has roughly 270 snakes, 9% of the world's 3000 odd types of snakes (Uetz *et al.*, 2021). To comprehend the local species richness and the distributions of species in the environment, it is crucial to catalog the diversity of snakes and other wildlife within distinct geographic regions. These sorts of inventories can be done at different spatial scales: in the country as a whole (Smith and Taylor, 1945); state level (Patel and Vyas, 2019);

the level of the province or district (Van Pham *et al.*, 2020); or even extremely localized (Prasad *et al.*, 2018).

Together with lizards, crocodiles, turtles, and tuataras, snakes represent the group of reptiles in the class Reptilia that is both the most fascinating and the most terrifying. Curiously, the snake never bites or attacks humans unless there is a risk to their life. In addition, despite the fact that the

majority of people view them as enemies, they are an essential part of the ecosystem and play a significant role in crop protection by devouring field rats (Pasar and Paul, 2016).

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, 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 Captain (2008), 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. 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. Without knowing the snake species as venomous or non-venomous it is killed. 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 observed (Sathish Kumar, 2012).

According to Smith (1943) and Pauwels *et al.* (2008) snakes are reptiles and are regarded as a successful group of predatory vertebrates that live in both tropical and temperate environments.. According to Indian Snakes Organization there are approximately 3273 known species of snakes worldwide, of which 302 have been identified in India. There are around 153 types of new water

snakes making around 5% of every single known snake (Pauwels *et al.*, 2008). According to Chandra and Gajbe (2005), 52 venomous species have been identified in India, of which 20 are sea snakes and 32 are terrestrial (Pythons, Vipers, coral snakes, Cobras, King cobras, and Kraits). The enormous four risky and major venomous snakes are the Indian Cobra, Krait, Russel's snake and Saw scaled snake. Hemotoxic venom, which affects the heart and cardiovascular system, neurotoxic venom, which affects the nervous system and brain, and cytotoxic venom, which has a localized effect on the bite area, are the three main types of snake venom. All venomous snakes belong to the family Elapids, Snakes and Colubrids. Some snakes are arboreal and burrowing, and they have adapted well to the climate by morphologically changing their size, shape, and color (camouflage). Snakes do not have external ears; instead, they sense through their eyes and smell with their bifid tongues. Some snakes, like pit vipers and pythons, also have heat-sensitive pits between their eyes and nostrils, allowing them to sense heat to catch prey and escape predators. Carnivorous in nature, all snakes primarily consume reptiles, amphibians, mammals, birds, and eggs.

Due to their high venom levels, some snakes, like cobras and vipers, can paralyze their prey. Others, like the python, squeeze their prey before swallowing it whole. Because they are cold-blooded, snakes keep track of their own body temperature and bask in the sun to warm themselves. They seek food and hiding places in forests, deserts, undergrounds, rocky terrain, wetlands, agricultural fields, and even densely populated urban areas like villages and city fringes. People used to kill snakes, especially in areas populated by humans, because they were afraid of being bitten. As a result, the number of snakes has decreased. The Indian Wildlife Protection Act (1972) now provides protection for pythons, cobras, and vipers. The present review is an attempt to evaluate the information, occurrence and distribution of snake species in Maharashtra and Andhra Pradesh of India.

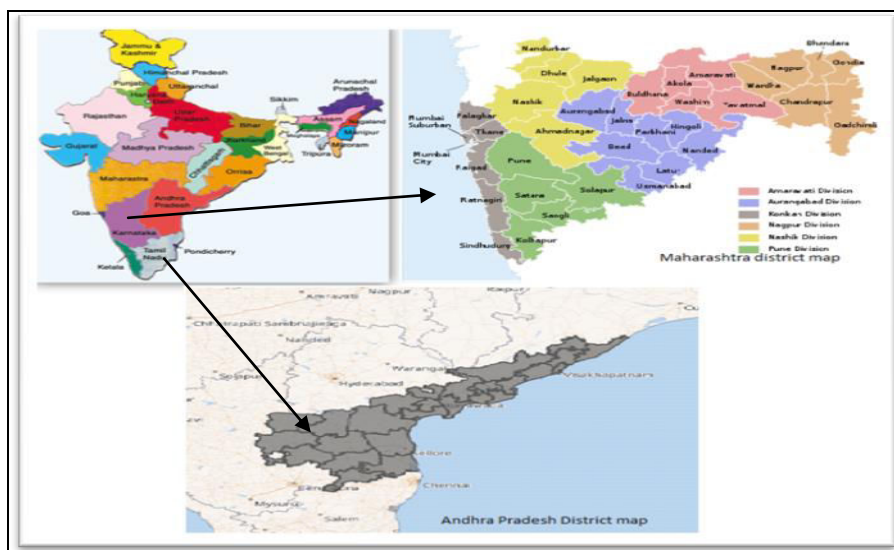


Fig. 1: India map showing different states (<https://www.toptourguide.com>).

India (Fig. 1) is situated north of the equator between 8°4' North (the mainland) to 37°6' north latitude and 68°7' east to 97°25' east longitude. It is the seventh-largest country in the world, with a total area of 3,287,263 square kilometers (1,269,219 sq mi). India measures 3,214 km (1,997 mi) from north to south and 2,933 km (1,822 mi) from east to west. It has a land frontier of 15,200 km (9,445 mi) and a coastline of 7,516.6 km (4,671 mi) (www.google.com). India has 28 states and 8 union territories.

In the western peninsula of India, the state of Maharashtra occupies a significant portion of the Deccan Plateau. The Arabian Sea is to its west, the Indian states of Goa and Karnataka are to its south, Telangana is to its southeast, Chhattisgarh is to its east, Gujarat and Madhya Pradesh are to its north, and the Indian union territory of Dadra and Nagar Haveli and Daman and Diu is to its northwest. The state of Andhra Pradesh is located in India's southern coastal region. With 49,577,103 people living there, it is the tenth most populous state and the seventh largest, sharing borders with Telangana, Chhattisgarh, Odisha, Tamil Nadu, Karnataka, and the Bay of Bengal. With approximately 974 kilometers or 605 miles, it has

the second-longest coastline in India (www.google.com).

Data was collected by referring books, journals, monographs and web references. In addition, secondary information was gathered from local people of surrounding areas and forest personnel about the different Snakes by interviewing and showing pictures of the species to them.

Snake varieties and distribution in Maharashtra and Andhra Pradesh states of India as worked out by various researchers is depicted in Table 1. Figure 2 depicts some poisonous and non-poisonous snakes.

Maharashtra:

On the basis of the data gathered from the survey from July 2017 to March 2018, Makne (2021) from Dhanlakshmi nagar, Parbhani, compiled a list of snakes. The snakes she captured represented 12 species from 5 families. Five of the snakes in these families were venomous, while others were not. Her study was an effort to assess the information regarding species richness and further contribute to the understanding, awareness,

Table 1: Total number of Snakes, families, Venomous status and snakes distribution in Maharashtra and Andhra Pradesh states of India as worked out by various researchers

S. No.	Total Species	Families	Area	V	NV	MV	References
1	21	-	Malegaon Tahsil, Washim district	05	15	01	Ingle <i>et al.</i> (2014)
2	31	07	Mokhada & Jawhar, Maharashtra	12	19	-	Bansode <i>et al.</i> (2016)
3	25	07	Palghar, Maharashtra	07	15	03	Raut <i>et al.</i> (2014)
4	25	06	Rural & semi urban areas of Buldhana, Maharashtra	05	17	03	Kale <i>et al.</i> (2019)
5	16	05	Lonar lake reservoir, Maharashtra	04	11	01	Khobragade and Pawar (2015)
6	18	06	Ratnagiri and Sindhu durga dist. Maharashtra	05	11	02	Pawar and Kadam (2016)
7	12	04	Parbhani dist. Maharashtra	03	08	01	Sagar <i>et al.</i> (2019)
8	12	05	Dhanalakshmi nagar, Maharashtra	05	06	-	Makne (2021)
9	16	05	Aurangabad dist. Maharashtra	04	10	02	Sirsat <i>et al.</i> (2016)
10	26	-	Nanded city Maharashtra	10	13	03	Rao <i>et al.</i> (2018)
11	25	10	Panvel Navi. Mumbai	06	19	-	Pawar <i>et al.</i> (2020)
12	42	-	Central Western ghats, Andhra Pradesh	-	-	-	Ganesh and Guptha (2021)
13	22	07	Seshachalam Biosphere reserve, Andhra Pradesh				Guptha <i>et al.</i> (2012)
V-Venomous ; NV-Non- Venomous ; MV-Mildy Venomous							



Fig. 2: Poisonous and Non-poisonous snakes.

and conservation of the region's snake fauna. Therefore, this survey may contribute to the discussion of biodiversity.

In the Aurangabad district, 16 species of snakes were identified by Sirsat *et al.* (2016). Of these, only four were poisonous, two were semi-poisonous, and the remaining ten were non-poisonous.

25 types of snakes from 6 families and 22 genera were recorded by Kale *et al.* (2019) in Buldhana area of Maharashtra with 17 species non-venomous, 3 semi-venomous and 5 species were venomous. Among these, 2 species were endemic to India and 7 species shows intriguing status.

Khobragade and Pawar (2015) 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 5 families and 16 species. There are 4 poisonous snakes from the Elapidae and Viperidae families, 11 non-poisonous snakes in the Typhlopidae, Colubridae, and Pythonidae families, and one species of snake in the Colubridae family. All of these snakes are rescued and released into their natural environments.

On the basis of the data gathered from the survey in the Mokhada region of Maharashtra, Bansode *et al.* (2016) created a snake checklist. The snakes that were taken belong to seven families and 31 different species. There were 19 non-venomous snakes and 12 venomous snakes in these families. Their study aimed to assess the information, occurrence, abundance, and species richness of snake fauna and further contribute to its understanding, awareness, and conservation.

Nande and Deshmukh (2007) additionally revealed 32 types of snakes in Amravati region. Joshi (2011) detailed 22 types of snakes in Buldhana area. Moreover, preliminary survey of snake diversity from Malegaon Tehsil of Washim District has been studied by Ingale *et al.* (2014). In

a previous study, Harney (2011) also examined the snakes of Bhadrawati, District Chandrapur (M.S.) and reported 15 venomous snakes, 4 non-venomous snakes, and 1 semi-venomous snake. They collected 466 snakes for their research, and they divided them up into six families: Elapidae, Viperidae, Colubridae, Diapsididae, Boidae, and Pythonidae. These families contain 17 different species. 4 noxious snakes, 12 non-poisonous and 1 semi-toxic snakes were accounted for.

Walmiki *et al.* (2012) have also studied the flora and fauna of Bassein Fort and the area around it in Thane, Maharashtra, India. The diversity of reptiles and amphibians in and around Bassein Fort has been reported. The reptilian variety involves 23 snake species, 3 skinks species, 5 gecko species and 1 turtle species. Ten distinct snake species were identified in study of the Kolak estuary Vapi, Gujarat, faunal diversity. Lewis *et al.* (2010) concentrated on the herpetological perceptions from field campaigns to North Karnataka and South-West Maharashtra and tracked down 28 types of snakes.

Pawar *et al.* (2020) 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 noticed 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 each to Erycidae and Natricidae and 1 species each to Homalopsidae, Lamprophiidae, Pythonidae, Sibynophiidae and Typhlopidae. Six venomous snake species and 19 non-venomous snake species were observed. The study demonstrates that the ecological conditions in the Panvel, Navi Mumbai, vicinity support a moderate snake density. It very well may be reasoned that over-double-dealing of regular assets in Panvel district because of progressing development of Navi Mumbai Worldwide Air terminal are the key elements influencing the variety and conveyance of snakes.

Raut *et al.* (2014) found 25 snake species in the Palghar region of Maharashtra, including 15

non-venomous, 3 semi-venomous, and 7 venomous species. Other reptiles would benefit from the area's hilly terrain, mangroves, close proximity to the sea, and lush green vegetation, but industrialization and infrastructure development in these areas pose a threat to these species. Due to habitat loss and environmental stress, a lot of snakes have appeared in and around areas where people live.

Sargar *et al.* (2019) have detailed the snake species variety of Jintur Sloping Region, District-Parbhani and close by 6 Km² region, which was figure out introductory time through their examination. 12 types of snakes counting 3 venomous, 1 Semi-Harmful and 8 non-noxious species from 4 families were reported. To learn more about the snake diversity, a direct encounter method, public reports, and individual observation survey were used. Humans either directly or indirectly killed snakes, and road killing was widespread.

Tambre and Chavan (2016) conducted the first-ever study of snake species diversity at S. R. T. M. University, Nanded, in the state of Maharashtra, India. They identified 12 snake species, including three venomous, one semi-poisonous, and eight non-poisonous species belonging to four families.

In the Indapur region of Maharashtra, Salunkhe (2023) recorded 22 species of snakes from four families in 2023. Five venomous, two semi-poisonous, and fifteen non-poisonous species were identified by Salunkhe (2023).

Venomous snakes incorporate around 58 types of which just 4 types of snakes are perilous to human (Jadhav *et al.*, 2018). These animals are being wiped out all over the world, necessitating a constant and laborious effort on the part of society's citizens from all walks of life to save them. Numerous researchers have examined the diversity and distribution of snakes in Maharashtra, including Bansode *et al.* (2016), Tambre *et al.* (2016), Joshi (2017), Bansode and

More (2018), Jadhav *et al.* (2018), Kale *et al.* (2019) and Pawar *et al.* (2020).

Andhra Pradesh:

There is still a lot of work to be done on snakes distribution in Telangana and Andhra Pradesh (Russell, 1796; Sanyal *et al.*, 1993; Srinivasulu and Srinivasulu, 2004; Srinivasulu *et al.*, 2006; Srinivasulu and Das, 2008). Russell (1796), who carried out extensive surveys in the Vishakhapatnam region, was the first person to conduct herpetofaunal surveys in the state. Many of the species Das (2004) described have Andhra Pradesh as their type state. The first person to collect zoological specimens from the state, particularly from the Eastern Ghats, was Thomas Claverhill Jerdon. The main study in the state was completed by the Zoological Survey of India (Sharma, 1969 1971, 1976). Murthy (1986) and Sharma (1969, 1971, 1976) conducted the reptilian survey at the Nagarjunasagar Dam area in Andhra Pradesh.

These reviews have prompted the revelation and depiction of new types of reptiles including the Bholanath's or Nagarjuna Racer Coluber bholanathi Sharma (1976), Agrawal and Bhattacharyya's (1976) contributions to the State's reptilian research are also noteworthy. Murthy and Venkateshwarlu (1979) reported the discovery of Indian rock agama in the Vishakhapatnam district. Sanyal *et al.* (1993) have given the insights regarding reptiles found in Andhra Pradesh till 1992. Srinivasulu and Das (2008), Javed *et al.* (2010), Ganesh *et al.* (2013) and Reddy *et al.* (2013) have also contributed to our understanding of Andhra Pradesh's reptile diversity. The vast majority of these investors have given information from Eastern Ghats in Andhra Pradesh. Sanyal *et al.* (1993) covered the study of herpetofauna in Telangana. An annotated checklist on the nomenclature, taxonomy, habitat use, adaptive types, and biogeography of the herpetofauna of the Nallamala Hills that covered five districts in both the Telangana and Andhra

regions of the former united Andhra Pradesh was provided by Srinivasulu and Das (2008).

Seetharamaraju *et al.* (2011) distributed data about rearing way of behaving of striped keelback. Srinivasulu *et al.* (2009) found a banded krait from the Warangal district again. Srinivasulu *et al.* 2011 reported the diversity of reptiles in Andhra Pradesh. Seetharamaraju *et al.* (2011) provided data about the dissemination of *Oligodon taeniolatus* in Andhra Pradesh.

Long-term fieldwork by Ganesh and Guptha (2021) allowed us to record the majority of known snake species. Huge discoveries incorporate the shieldtail snake *Uropeltis cf. ellioti*, the pit viper *Trimeresurus gramineus*, colubrid snakes like *Liopeltis calamaria*, *Lycodon flavicollis*, and *L. deccanensis*, *Chrysopelea taprobanica*, *Sibynophis subpunctatus*, *Platycephalus bholanathi*, *Boiga forsteni*, and *Boiga flaviviridis* (Guptha *et al.* 2012; Vogel and Ganesh, 2013; Ganesh *et al.*, 2017).

Psammophis, *P. condanarus* (known as *P. indicus*) by Beddome (1863) from the Nullay Mullay hills, and *P. longifrons* by Boulenger (1890) from the Cudappah hills were the first snakes described from this area. The subsequent species has not yet been discovered within close proximity to its type locality (Visvanathan *et al.*, 2017).

Gupta *et al.* (2012) have also recorded 34 species of Reptiles from in 11 families. Among them, 22 species of snakes and 12 species of lizards. The snakes belong to 7 families, more number of snakes recorded from the family Colubridae followed by Boidae Elapidae (3 species), Viperidae (2 species), Typhlopidae (1 species) and Uropeltidae (1 species) were recorded indicated that the area is rich and may contain many more species of amphibians and reptiles.

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. According to Lingayat and Wankhade (2008), snakes have been responsible for the first type of poisoning since the time of the earliest humans. 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 (Harney, 2011; Walmiki *et al.*, 2012; Sirsat *et al.*, 2016).

As tea plantations, paddy fields, village huts, and city warehouses provided new opportunities for worms and insects, birds, rats, mice, and other 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 *et al.* (2012b) 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. 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. (Joshi, 2011) Rare species such as the "Indian rock python" and "Striped keel back" are members of the Colubridae and Pythonidae families, respectively (Nande and Deshmukh, 2007). As a result, it is essential to carry out systematic research and long-term monitoring on this significant group of animals (Wanje and Gadekar, 2011; Khobragade and Pawar, 2015).

Conclusion

People believe that every snake is poisonous and fail to distinguish between poisonous and non-poisonous snakes, which is why they kill them. The majority of the land is agricultural, which

draws frogs, rodents, and snakes; 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

- Agrawal VC and Bhattacharya TP. (1976) Report on a collection of mammals from Nagarjunasagar, Andhra Pradesh. Newsletter Zool Survey India 2(5): 212-216.
- Bansode SA and More VR. (2018) An updated list of serpent from Palghar district of Maharashtra, India. J Entomol Zool Stud. 6: 375-379.
- Bansode SA, More VR and Mirza KA. (2016) A study on snakes from Mokhada and Jawhar (Dist. Palghar) Maharashtra, India. Int J Fauna Biol Stud. 3: 103-115.
- Beddome RH. (1863) Further notes upon the snakes of the Madras Presidency; with descriptions of new species. Madras Quarterly J Med Sci. 6: 4148.
- Boulenger GA. (1890) The Fauna of British India, including Ceylon and Burma. Reptilia Batrachia, Taylor and Francis, London, xviii, pp 541.
- Chandra K and Gajbe PU. (2005) An inventory of herpeto fauna of Madhya Pradesh and Chhattisgarh. Zoos Print J. 20(3): 1812-1819.
- Das I. (2004) Herpetology of an antique land: the history of herpetological explorations and knowledge in India and south Asia. In: Herpetological expeditions and voyages, (ed.) Bauer A.M., Bonner Zoologische Beiträge 52(2): 215-229.
- Ganesh SR and Guptha B. (2021) Herpetological diversity in the Central Eastern Ghats, Peninsular India. J Anim Diversity 3(3): 18-44.
- Ganesh SR, Adimallaiah D and Kailash PK. (2013) New locality record of Nagarjun Sagar Racer Snake *Coluber bholanathi* Sharma, 1976. Herpetotropicos 9(1): 9-12.
- Ganesh SR, Rameshwaran M and Joseph NA. (2017) New record of the yellow-collared wolf snake *Lycodon flavicollis* Mukherjee and Bhupathy, 2007, from the Coutrallam Hills, Southern Western Ghats, Indian peninsula. Sauria 39(1): 58-61.
- Guptha BM, Chalapathi Rao PV, Sivaram Prasad NV, Sekhar Maddala SRSC, Madhu Babu P and Srinivas Reddy D. (2012) Status of herpetofauna in Seshachalam Biosphere Reserve, Eastern Ghats Andhra Pradesh, India. World J Zool. 7(2): 131-134.
- Harney NV. (2011) Studies on snakes of Bhadrawati, District Chandrapur (M.S.) India. Online Int Interdiscipl Res J. 1(1): 12-17.
- Ingale P, Bali S and Khandale J. (2014) Preliminary survey of snake diversity from Malegaon Tehsil of Washim District. World J Zool 9(2): 134-137.
- Jadhav PL. (2018) Snake species diversity and their distribution in and around Nanded city, Maharashtra, India. J Entomol Zool Stud. 6: 1855-1860.
- Jadhav PL, Chavan SP and Trimukhe HS. (2018) Snake species diversity and their distribution in and around Nanded city, Maharashtra, India. J Entomol Zool Stud. 6(4): 1855-1860.
- Javed SMM, Tampal F and Srinivasulu C. (2010) First record of *Coelognathus radiatus* (Boie, 1827) (Reptilia: Colubridae) from the Ananthagiri Hills, Eastern Ghats, India. J Threatened Taxa 2(9): 1172-1174.
- Joshi P. (2011) A preliminary survey on the snake of Buldhana district, Maharashtra. Golden Res Thoughts 1(2): 1-4.
- Joshi P. (2017) A herpeto faunal inventory of Vidarbha region, Maharashtra, India. Biosci Discovery 8: 582-587
- Kale GB, Vairale Shiva and Ghait SN. (2019) Study of snake species diversity in rural and semi urban areas of Buldhana district of Maharashtra, India. Int J Life Sci. A13: 219-225.
- Khobragade K and Pawar VB. (2015) Diversity and ecological status of serpent fauna of degraded forest

- habitats of in and around Lonar lake Reservoir (Lonar Crater Rim), Buldhana District, Maharashtra. *Int J Engineer Sci Invention* 4(1): 19-21.
- Lewis T, Piggott S, Griffin R, Grieg-Smith P, Martin G, Barretto G, Bajibab K, Thorpe Christopher, Prodromou P, Fordham M, Willis D, Turner, J, Radanovic A, Holloway D, Wood R, Hand N, Lloyd S, Clapson M, Hennesy J, Oldham G. (2010) Herpetological observations from field expeditions to North Karnataka and South-west Maharashtra. *Herpetological Bull.* 112: 17-37.
- Lingayat AM and Wankhade PR. (2015) Study of clinical profile complications and outcome in patients of snake bite in pediatric age group. *Healthcare Biomed Res.* 3 (3): 203-208.
- Makne HD. (2021) A survey on diversity of snakes found in and around Dhanlaxmi Nagar, Parbhani, M.S. India. *J Emerging Technol Innov Res* 8(12): 424-428.
- Murthy TSN. (1986). Lizards of Kurnool district. *Bull Maryland Herpetol Soc.* 22(3): 134-143.
- Murthy TSN and Venkateswarlu T. (1979) Record of the rock-lizard, *Psammophilus blanfordanus* (Stoliczka) (Sauria: Agamidae) in Araku Valley, Eastern Ghats (Andhra Pradesh), India. *J Bombay Natural History Soc.* 76(3): 524.
- Nande R and Deshmukh S. (2007) Snakes of Amrawati district including Melghat, Maharashtra, with important records of the Indian egg-eater, Montane trinket snake and Indian smooth snake. *Zoos Print J.* 22(12): 2920-2924.
- Pasar V and Paul RA. (2016) Preliminary survey of snake fauna in and around Chincholi Forest, Kalaburagi District Karnataka, India. *Int J Sci Res Sci, Engineer Technol.* 2(5): 342-344.
- Patel H and Vyas R. (2019) Reptiles of Gujarat, India: Updated checklist, distribution, and conservation status. *Herpetology Notes* 12: 765-777.
- Pauwels OSG, Wallach V and David P. (2008) Global diversity of snakes (serpents; Reptilia) in freshwater. *Develop Hydrobiol.* 54: 599-605.
- Pawar PR, Rokade AG, Supnekar SP, Meshram LN, Pawar NB and Gavhane UV. (2020) Diversity and distribution of snakes in adjoining areas of Panvel, Navi Mumbai, West Coast of India. *Intern J Zool Invest.* 6(2): 289-300.
- Prasad VK, Verma A and Shahabuddin G. (2018) An annotated checklist of the herpetofauna of the Rashtrapati Bhawan Estates, New Delhi, India. *J Threatened Taxa* 10(2): 11295-11302.
- Raut SR. (2014) Recent studies on the biodiversity of snakes in Palghar region, Thane, Maharashtra, India. *Adv Appl Sci Res.* 5(2): 373-381.
- Reddy AY, Sadasivaiah B, Indira P and Pullaiah T. (2013) Herpetofauna of Thummalapalle uranium mining area, Andhra Pradesh, India. *Int J Biodiver Conserv.* 5(8): 515-522.
- Russell P. (1796) An Account of Indian serpents, collected on the coast of Coromandel; containing descriptions and drawings of each species; together with experiments and remarks on their several poisons. W. Bulmer and Co. Shakespeare-Press, London, pp. 49.
- Sanyal DP, Gupta BD and Gayen NC. (1993) Reptilia. In: State Fauna Series 5. Fauna of Andhra Pradesh, (ed.) Ghosh A.K., Part I. Zoological Survey India, Calcutta, pp. 63.
- Salunkhe RV. (2023) Snakes of Indapur: Diversity and awareness. 1st edn., Bhumi Publishing, Nigave Khalasa, Kolhapur, Maharashtra, India.
- Sargar GS, Bhagwat GT, Achegawe RM, Niwrat G.P and Hasekar AS. (2019) Recent study on biodiversity of snakes in Jintur hilly region Parbhani district, (MH) India. *J Emerging Technol Innov Res.* 6(6): 729-736.
- Sathish Kumar VM. (2012) The conservation of Indian Reptiles: An approach with molecular aspects. *Reptile Rap.* 14: 2-8.
- Seetharamaraju M, Srinivasulu C and Srinivasulu B. (2011) New records of *Oligodon taeniolatus* (Jerdon, 1853) (Reptilia: Colubridae) in Andhra Pradesh, India. *Herpetology Notes* 4: 421-423.
- Sharma RC. (1969) Two new lizards of the genera Mabuya Fitzinger and Riopa Gray (Scincidae) from India. *Bull Systematic Zool Calcutta* 1(2): 71-75.
- Sharma RC. (1971) The reptile fauna of the Nagarjunasagar Dam area (Andhra Pradesh, India). *Records Zool Survey India* 63(1-4): 77-93.
- Sharma RC. (1976) Some observations on ecology and systematics of *Coluber bholanathi*, a new species of snake (Reptilia: Squamata: Colubridae) from India. *Comp Physiol Ecol.* 1(1): 105-107.
- Sirsat CV, Patil MU and Ujiwal V. (2016) Analysis of data on snakes diversity and ecological status from Aurangabad District, (MS) India. *Biosci Discovery,* 7(2): 162-165.
- Smith HM and Taylor EH. (1945) An annotated checklist and key to the snakes of Mexico. *Bull United States National Museum.* <https://doi.org/10.5479/si.03629236.187.1>.
- Smith MA. (1943) The Fauna of British India, Ceylon, and Burma, Including the Whole of the Indo-Chinese Sub-region. Reptilia and Amphibia Serpentes, vol. 3, Taylor and Francis, London.
- Srinivasulu C and Das I. (2008) The herpetofauna of Nallamala Hills, Eastern Ghats, India: an

- annotated checklist, with remarks on nomenclature, taxonomy, habitat use, adaptive types and biogeography. *Asiatic Herpetol Res.* 11: 110-131.
- Srinivasulu C and Srinivasulu B. (2004) Herpatofaunal diversity of Rollapadu Wildlife Sanctuary and its vicinity, Andhra Pradesh, Proc National Symp Bioresources, Biotechnology Bioenterprises, 2003, Dept. of Zoology, Osmania University, Hyderabad, pp. 52-60.
- Srinivasulu C, Srinivasulu B, Seetharamaraju M, Sreekar R and Harpreet K. (2011) Reptiles of Andhra Pradesh. *Paryavaranam* 5(3): 2-7.
- Srinivasulu C, Srinivasulu B and Nageswara Rao CA. (2006) Reptilian fauna of Nagarjunasagar Srisailem Tiger Reserve, Andhra Pradesh. *Records Zool Survey India* 106(3): 97-122.
- Srinivasulu C, Venkateshwarlu D and Seetharamaraju M. (2009) Rediscovery of the Banded Krait *Bungarus fasciatus* (Schneider, 1801) (Serpentes: Elapidae) from Warangal district, Andhra Pradesh, India. *J Threatened Taxa* 1(6): 353-354.
- Tambre NG and Chavan SP. (2016) Snake species diversity of Swami Ramanand Teerth Marathwada University, Nanded, Maharashtra State, India. *Int J Curr Res Aca Rev.* 4(6): 104-115.
- Uetz P, Freed P and Hošek J. (2020) The Reptile Database. <http://www.reptile-database.org>.
- Van Pham A, Ziegler T and Nguyen TQ. (2020) New records and an updated checklist of snakes from Son La Province, Vietnam. *Biodiversity Data J.* 8: e52779.
- Visvanathan AC, Anne S and Kolli AK. (2017) New locality records of the Stout Sand Snake *Psammophis longifrons* Boulenger, 1890 (Reptilia: Squamata: Lamprophiidae) in Telangana, India. *J Threatened Taxa* 9 (11): 10968-10970.
- Vogel G and Ganesh SR. (2013) A new species of cat snake (Reptilia: Serpentes: Boiga) from dry forests of eastern Peninsular India. *Zootaxa* 3637(2): 158-168.
- Walmiki N, Awsare V, Karangutkar S, Wagh V, Yengal B, Salvi S and Pillai R. (2012) Herpetofauna of Maharashtra Nature Park, Mumbai, Maharashtra (India). *World J Environ Biosci.* 1(2): 90-99.
- Wanje SD and Gadekar RD. (2011) Clinical profile of snake bite cases in Marathwada, India. *Indian J Fundamental Appl Life Sci.* 1(4): 93-99.
- Whitaker R and Captain A. (2008) Snakes of India. The Field Guide. 2nd edn., Draco Books.
- <https://jlrexplre.com/explore/explore-pulse/snakes-of-agumbe>.