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A Preliminary Survey on Diversity and Distribution of Snake Fauna in Nalbari District of Assam, North Eastern India



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Abstract

Snakes are probably the most misunderstood and universally disliked animals in the world since time immemorial. It is true that bite of some poisonous snakes is sometimes fatal, but most of them are harmless and beneficial to us. Unfortunately, most of our fears about snakes are based on sheer ignorance and baseless superstitions. The Reptilian fauna is one of the targeted faunas facing trouble due to anthropogenic developments (Gibbons et al. 2000). An urban development or expansion victimizes reptiles firstly, ultimately resulting in the deterioration of the fauna by habitat destruction or alteration. Such situation ends up with too many reptilian species co-existing with the urban world (McKinney 2006). This has raised the numbers of reptilian species in the newly developed urban areas located in the outskirts of the city, including numbers of snake species (Purkayastha et al. 2011). A few species of snakes have adapted to human habitation, especially in the suburban backyards, urban gardens, roofed houses (old style) and open sewages. Thus, urban habitation acts as advantageous habitat for few snake species, in terms of food and shelter. The Indian snake fauna is very rich and diversified. Whitaker & Captain (2004) listed about 275 species belonging to 11 families of snakes found within the political boundary of India. All snake species are legally protected under Indian Wildlife (Protection) Act, 1972 from Schedule I to Schedule IV (Vyas 2007b). In spite of this legal protection, many snake species are killed brutally, especially in the rural areas of India.

Keywords: Reptiles, Human Habitat, Urbanization, Extinction, Wildlife Protection Act, 1972.

Introduction

The north eastern part of India has experienced changes at a greater extent over the last few decades as a result of urbanization. The species has been found in this study are also under the threat of extinction because of their large scale habitat destruction in recent times. So, it is very crucial to identify their habitat and conserve it in order to conserve these species.

Aim of the Study

The present study was carried out in Nalbari district of Assam on the following aspects:

1. To study the present distribution of snakes in Nalbari district, Assam.
2. To visualize the different species of snakes found in the area.
3. To identify and catalogue the species of snakes of the district.
4. Evaluate some initial data of threats on the snake fauna in the area.

Study Area

The present Nalbari district of Assam was carved out, from the erstwhile Kamrup district on 14th August, 1985 with its headquarters at Nalbari town. It was one of the civil sub-divisions of the then Kamrup district from 1967. Extending between 26°10'N and 26° 47'N latitudes and 90°15'E and 91°38'E longitudes, the district is bounded by Bhutan on the north, Kamrup district on the south and east and Barpeta district on the west

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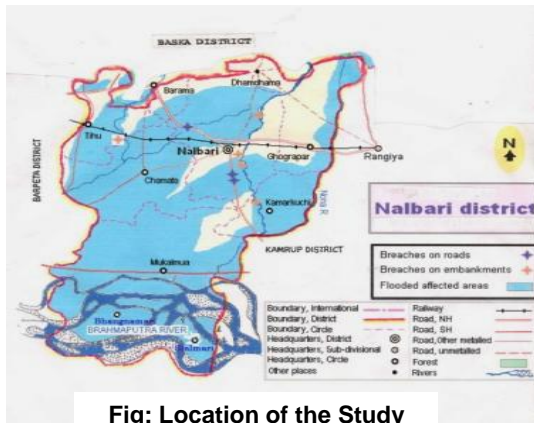


Fig: Location of the Study

Review of Literature

India has wide diversified geographical and climatic conditions to support varied life forms. Due to its unique conditions of habitat and a great diversity of life, the North-East region of India has been identified as one of the Mega diversity hotspot of the 24 such spots world over.

The snakes are found in India in every available habitat occupying highly diversified niches and are represented by around 280 species. In India scientific evaluation and documentation of serpents was initiated in the 19th century mostly by the British officers and naturalists, and some well knitted authoritative books were published (Gunther 1864, Boulenger 1890, Cazaly 1914, Smith 1943). Since independence several studies on distribution and diversity of snake have been made in different parts of the country. Tiwari and Sharma (1971) studied the reptiles of Western Maharastra, Sharma and Sharma (1976) described 30 species of snakes under 20 genera and 5 families from the state of Jammu and Kashmir, Whitaker and Whitaker (1977) made collections of rare snake in the Nilgiris. Rajendra (1977) reported 26 species of *Uropeltid* snakes. Murthy (1978) reported 30 species of snakes under 25 genus and 6 families from the vicinity of Madras. Malhotra (1982) reported 17 species of snakes from Bandipur Reserve Forest, Karnataka. Murthy (1989) reported 12 species of snakes under 3 genus from Kalakad Wild Life Sanctuary, Tamil Nadu. Das and Whitaker (1990) described 5 species of snakes from the Western Ghats. Dasgupta and Sanyal (1990) collected 6 species of snakes from Baster District of Madhya Pradesh. Sharma (1997) reported 22 species of snake species from Phulwari National Wild Life Sanctuary, Rajasthan.

The evaluation of snake fauna was initiated in the N.E. simultaneously with other parts of India. It was cantor (1839) who first made a study on the fauna of North East (Undivided Assam) and recorded *Pareas monticola*, *Trimeresurus macrosquamatus* and *Trachischium monticola* from Naga hills, *Elaphe cantoris*, *Oligodon albocinctus*, *Bungarus bungaroides* from Khasi hills (Cherrapunjee), *Elaphe radiata*, *E. porphyracea*, *Psammodynates pulverulentus*. *Bungarus lividus* and *Naja kouthia* from Assam. Gray (1853) added *Typhlops diardi*, *Elaphe frenata*,

Sibynophis collaris and *Amphiesma khasiensis* to the snake faunal list of Khasi Hill. Blyth (1853, 1854) reported the presence of *Elaphe prasina*, *Amphiesma platyceps*, *Blythia reticulata*, *Boiga cyanea* and *Callophis maclellandi* from Assam. Anderson (1871) recorded *Oligodon cinereus* from Naga hills and Gunther (1864, and 1875) and noted *Elaphe prasina*, *Dinodon septentrionalis*, *Amphiesma modesta* and *Trimeresurus jerdoni*. Wall (1908 - 1922) critically evaluated the snake fauna of the North-East India and recorded several new species. Wall (1907) Studied the Khasi hill's snakes and described a new endemic species of natricine, *Amphiesma xenura*. Further, wall (1908) recorded two new species of snake, *Boiga quincunciata* and *Dendrelaphis gorie*, from Tinsukia and Sadiya respectively. Wall (1909 & 1910) evaluated the snake fauna of upper Assam and recorded as many as 16 species namely,

Ramphotyphlops brahminus, *Typhlops diardi*, *Zaocys nigromarginatus*, *Dendrelaphis pictus*, *Lycodon jara*, *L. aulicus*, *Trachischium monticola*, *Boiga gokool*, *B. cyanadon*, *Dryophis fronticinctus*, *D. prasinus*, *Enhydris enhydris*, *Bungarus niger*, *B. lividus*, *Callophis maclellandi* and *Ophiophagus hannah*. He (1910& 1922) also recorded two more new species of *Oligodon* from North East viz., *O. erythrorachis* from Naga hill and *O. melazonotus* from upper Rotung, Further Prater (1920 and 1935) reported two new snakes *Oligodon theobaldi* and *Boiga multimaculata* from Assam. Biswas et. al. (1970) reported new record of *Python molurus bivittatus* from Khasi Hills of Assam (Meghalaya). Talukder (1977) reported new distribution of *Vipera russelli* from Assam. Mathew (1983) listed only 33 species of snakes from N.E. India and recorded, *Ramphotyphlops brahminus*, *Python molurus*, *Ahaetulla ahaetulla*, *Enhydris enhydris*, *Rhabdophis subminiatus*, *Bungarus fasciatus* and *Ophiophagus hannah* from Assam in the North-East India., Meghalayan snake fauna is well documented. Mathew (1995) studied distribution of snakes in Meghalaya and noted 56 species from the state. Recently Captain & Bhatt (2000) studied the snake fauna of Arunachal Pradesh and described 62 species from the state, which includes 3 new report, these are *Amphiesma venningi*, *Sinonatrix percarinata* and *Trimeresurus medoensis*. Slowinski (2001) recorded a new *Lycodon* species known as *Lycodon zawii* from N.E. India. Power and Birand (2001) surveyed some protected areas of N. E. India and recorded 57 species of snakes only from nine protected areas. Recently Sanyal et. al. 2002 reported 12 species of snakes from Tripura and opined that the reptilian fauna of the snake represented a mixture of those of Southern Assam and Bangladesh. David and Mathew (2005) reported about the old snake collection at eastern regional station of Zoological Survey of India, Shillong. From the year 1997, the Division of Herpetology at Aaranyak initiated its Herpetological research and conservation Program covering the Northeast India and came up with many significant findings. From the year 2003, the division started its Herpetofaunal inventory in Kaziranga National park, Southern Nagaland and in Arunachal

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Pradesh. This led to few significant findings on reptiles of the region that were reported (See Ahmed and Das 2006; Das and Ahmed; 2007a; Das and Ahmed 2007b; Das et al 2007; Das and Das, 2007). India is home to 275 species of snakes (Whitaker & Captain, 2004) of which 102 species have been so far recorded from Northeastern India (Ahmed et al 2009).

The record of snakes of Assam is far from complete and many species of the state are yet to be explored as there is lack of sufficient information and references regarding the faunal diversity of snakes in the North Eastern part of India. Apart from the above mentioned studies and researches, as per my knowledge there is no such recent information available on the study and findings of snakes in Northeast and particularly in Assam.

Methodology

The study was carried out during the period of December 2017 to April 2018. During the survey all the important species were documented through photographs.

Primary Data

Field surveys done by visual encounter and plot and transect survey.

Entire study area was identified and classified as per available known various major habitats like, wetlands, bamboo vegetation, grassland, woodland, scrubland and riparian vegetation. Also investigation was done in household areas for some common snakes.

During survey the line transect method was followed.

Line Transect

Transect is a path along which one counts and records occurrence of the interested objects. Line transect is the method of sampling elements in a region, where an element is sampled if the chosen line segment called "transect" intersects the elements.

It is a reliable, versatile and easy method to analyze or record the diversity of species of an area.

Line transects are used to illustrate a particular gradient or linear pattern along which plants or animals change. Though this method of survey do not produce much information on the relative densities of individual species, but tell us what species are present there.

Secondary Data

Journals, Magazine, Books on Herpetofauna.

In addition, information was also gathered from local people of surrounding villages, forest personnel about the different species of Snakes found in the area by communicating with them.

Identification

The survey was done by actively searching the snake species on areas of favorable habitats and recording its habitat, physical feature, ecological condition and systematic position.

Identification was done by comparing the recorded morphological characters, measurements, photographs with the keys and identifying literatures. Also helps are taken from field guide books (Indian Snakes, A field guide by Neelim Kumar Khaire) related to snake identification and for taxonomic arrangement and status, IUCN Red list Category was studied and applied.

Results and Findings

During the survey, 15 species of snakes included in 5 families (Elapidae, Colubridae, Typhlopidae, Pareidae and Pythonidae) were recorded. All the species are then categorized by checking the IUCN Red list and it has been found that the family Colubridae comprises of highest number of species in comparison with the others.

From the result it has been found that among the total number of species there were 11 Non-venomous, 1 mildly Venomous and 3 venomous snake species are been recorded during the survey.

Table 1

S. No.	Family	Common Name	Scientific Name	IUCN Status
1.	Pareidae	Assam Snail Eater	<i>Pareas monticola</i>	LC
2.	Elapidae	Banded Krait	<i>Bungarus fasciatus</i>	LC
3.	Colubridae	Banded Trinket Snake	<i>Oreocryptophis porphyracea</i>	NE
4.	Typhlopidae	Brahminy Worm Snake	<i>Ramphotyphlops braminus</i>	LC
5.	Colubridae	Checkered Keelback Water Snake	<i>Xenochrophis piscator</i>	LC
6.	Colubridae	Collared Black Headed Snake	<i>Sibynophis collaris</i>	LC
7.	Colubridae	Common Wolf Snake	<i>Lycodon aulicus</i>	LC
8.	Colubridae	Copper Headed Trinket Snake	<i>Coelognathus radiatus</i>	LC
9.	Colubridae	Indian Rat Snake	<i>Ptyas mucosa</i>	LC
10.	Pythonidae	Indian Rock Python	<i>Python molurus</i>	NT
11.	Elapidae	Monocled Cobra	<i>Naja kaouthia</i>	LC
12.	Colubridae	Painted Bronzeback Tree Snake	<i>Dedrelaphis pictus</i>	LC
13.	Colubridae	Red Necked Keelback Snake	<i>Rhabdophis subminiatus</i>	LC
14.	Colubridae	Spotted Cat Snake	<i>Boiga multomaculata</i>	NT
15.	Colubridae	Striped Keelback	<i>Amphiesma stolatum</i>	LC

Table 2

Species	Venom	Habitat Type
<i>Boiga multomaculata</i>	Mildly venomous	Trees in forests, rocky surfaces
<i>Amphiesma stolatum</i>	Non venomous	Forests, gardens, agricultural lands
<i>Coelognathus radiatus</i>	Non venomous	Dry deciduous forests, water bodies
<i>Dedrelaphis pictus</i>	Non venomous	Moist deciduous forests, gardens

<i>Lycodon aulicus</i>	Non venomous	Human habitation, old houses
<i>Oreocryptophis porphyracea</i>	Non venomous	Bushes in forests, around human settlement
<i>Ptyas mucosa</i>	Non venomous	Agricultural fields, forests
<i>Python molurus</i>	Non venomous	Forests, rocky areas
<i>Pareas monticola</i>	Non venomous	Forests, small shrubs
<i>Ramphotyphlops braminus</i>	Non venomous	Leaf litter, under stones
<i>Sibynophis collaris</i>	Non venomous	Forests
<i>Xenochrophis piscator</i>	Non venomous	In and around water bodies
<i>Bungarus fasciatus</i>	Venomous	Fields, forests
<i>Naja kaouthia</i>	venomous	Fields, tree holes, rat burrows
<i>Rhabdophis subminiatus</i>	venomous	In and around water sources, paddy fields

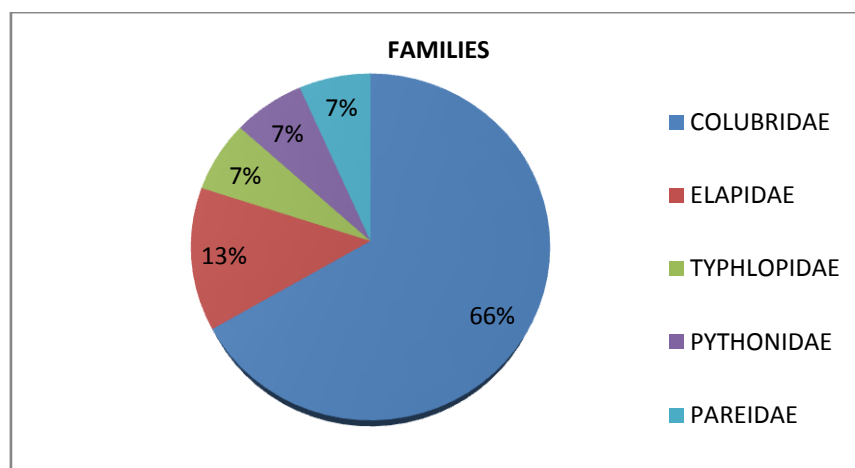
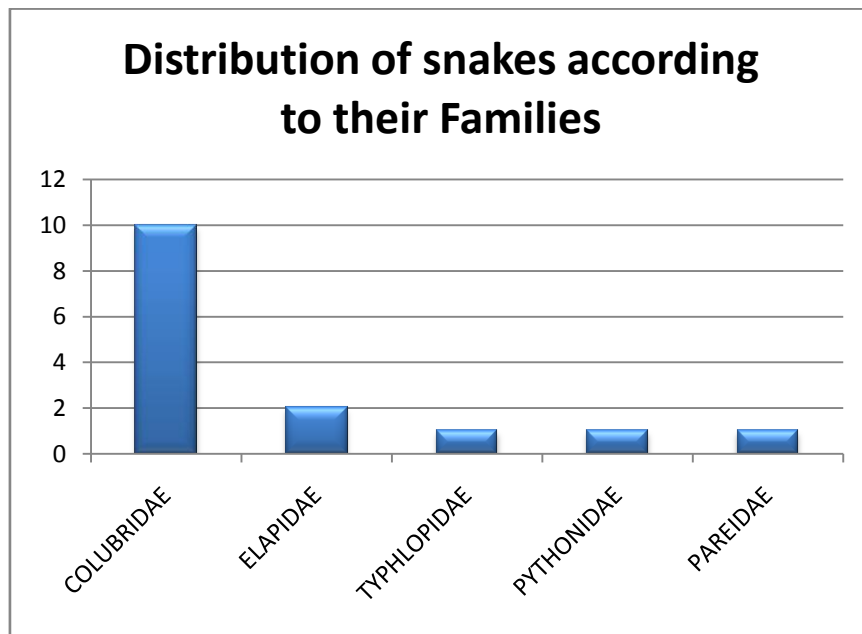


Fig: Diagrammatic view of snake population

Discussion

Findings of the present investigation on the “A Preliminary Survey on Diversity and Distribution of Snake Fauna in Nalbari District of Assam, North Eastern India” has revealed the high diversity and species richness of snake fauna in the district. In the survey 15 snake species belonging to 5 families were recorded from the district.

From the above mentioned results, it has been found that most of the commonly available snakes are non venomous, except a very few which are venomous in nature. Among the 15 species that are recorded during the survey; *Ramphotyphlops braminus*, *Xenochrophis piscator*, *Dedrelaphis pictus*, *Ptyas mucosa*, are found to be most abundant and frequently seen species in the study area. Also the

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family Colubridae has got the highest number of species in terms of diversity in the district.

In the recent times, due to human encroachment and industrial growth in the area has drastically affects the snake fauna of the district which results in sharp reduction in their numbers. As vital predator in sensitive habitats such as agricultural fields, their decline will have wider ecological consequences. Although majority of the district is covered by rural areas, but with times habitat loss caused by tremendous population pressure. Besides, irresponsible killing to avoid snakebite both from poisonous and nonpoisonous varieties is another reason for the gradual declining snake population. Apart from killing of snakes out of fear; habitat loss, unscientific handling by snake catchers and charmers, and netting by fishermen also contributes to snake mortality to a large extent. Snakes are very much sensitive to seasonal activities, hibernations, aestivations and breeding time; therefore a little change in the climate and environment can have huge impact on their population. Due to climate change, many species have changed their habitat to cope up with changing environment. But the detection of population declines in snakes is quite difficult due to their low population densities. Finding of 15 species during my study is a sign that the snake fauna in the district is still in a less disturbed state despite of the threats posing on their population.

Photo Plates

Plate no 1: Assam Snail Eater (*Pareas monticola*)



Plate no 2: Banded Krait (*Bungarus fasciatus*)



Plate no 3: Brahminy Worm Snake (*Ramphotyphlops braminus*)



Plate no 4: Banded Trinket Snake (*Oreocryptophis porphyracea*)



Plate no 5: Checkered Keelback (*Xenochrophis piscator*)



Plate no 6: Collared Black Headed Snake (*Sibynophis collaris*)



Plate no 7: Common Wolf Snake (*Lycodon aulicus*)

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Plate no 8: Copper Headed Trinket Snake (*Coelognathus radiates*)



Plate no 9: Indian Rat Snake (*Ptyas mucosa*)



Plate no 10: Indian rock python (*Python morulus*)



Plate no 12: Painted Bronzeback Tree Snake (*Dendrelaphis pictus*)



Plate no 13: Red Necked Keelback (*Rhabdophis subminiatus*)



Plate no 14: Spotted Cat Snake (*Boiga multomaculata*)



Plate no 15: Striped Keelback (*Amphiesma stolatum*)



Conclusion

Snakes are depicted as important objects of ecosystem in all types of literature since Vedic period (Prakash. 1991). However, public in general and biologist in particular pay little attention to the conservation of snakes. The loss of earth's biodiversity has attracted much attention and debate world over, only from the last decade. But mainstream conservation literature is found to be seriously lacking in the mention of snakes while discussing biodiversity loss even though this group is known to have high diversity among the Reptilians. Consistent methods of ecological status determination and the development of management strategies for snake population in India have yet to be developed. The North East India is known to support a species rich snake fauna including some endemic species, but reports on diversity of snakes of this region is absolutely lacking.

The present study is aimed at evaluating snake species abundance relations in Nalbari District, Assam. Many species of snakes today are on the verge of extinction. During our lifetime some of them will even cease to exist. A large number of snakes are killed due to the misconceptions that we harbour about them. It's high time that we must realize that snakes are a vital part of our ecosystem and are not expendable creatures.

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