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Short Communication

A baseline assessment, threats and conservation measures to ophidians at Rukhi Hill Forest, Nayagarh, Odisha, India

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Abstract

A study has been conducted to know the diversity and threats to ophidians of Rukhi Hill Forest from June 2018 to March 2019. Standard methodologies were applied for the assessment. Visual encounter Survey was taken for the data collection. The snakes were handled by Snake sticks and hooks, and Photographs were taken for better identification. The snakes were identified by matching photos with the field guide book. After spontaneous field study 14 species (out of which only 5 species are poisonous) were encountered from the hill forest. The study comprised of 4 families and 12 genera. Then the species were marked with IUCN Redlist Category. Major causes of declination of snake diversity are continuous forest fire causing habitat loss, climate change, illegal expansion of urban area etc. By awareness and lawful action, the depletion of biodiversity may be check which is important for future generation. Otherwise total ecology may disrupt, and endemic species of this area may be vanished.

Keywords: Ophiology, venomous, IUCN, Hill forest, awareness and endemic species.

Introduction

Snakes are a major group of reptiles included under sub-order Ophidia of order Squamata. Ophiology is a sub-discipline of herpetology that deals with the scientific study of snakes. Snakes have considered as the best genealogy among living reptiles as far as species richness, morphological and natural adequate variety[1].

Majority of the snake species are found in the arid zone of the world[2]. All over the world people fear and dislike the snakes moreover illiteracy among people about snakes results into killing whenever and wherever they are seen[3]. They are murdered without aware of the snake species as venomous or non-venomous. They are the indication of fear among individuals however the vast majority of the snakes are non-venomous and beyond price to both humans and the ecosystem[4].

Snakes are well known for their hibernation and aestivation. It is possible due to their ability to survive without feeding for a long duration. Another special character of snakes is ecdysis. Snakes are said to be friends of farmers[5,6] because they are natural predators of harmful rodents and insects in agriculture fields, but in India, the lack of awareness among the farmers and people in the rural area hundreds of snakes are killed by the people.

A total of 10793 species of reptiles are found in the World. There are about 3709 species of snakes (as of July 2018) were in records under 86 families all over the world. There are 726 species of reptiles found in India out of which Snakes rules with 372 species[7]. More than 80 species of snakes have been reported in Odisha including, 20 marine snakes species[8,9].

Since ancient time, the snakes are a standout amongst the best vertebrates on the earth among reptiles, therefore a decrease in their numbers may have a significant outcome for the smooth keeping up of an ecosystem[10]. But unfortunately, due to anthropogenic activities, these are depleting very quickly from the earth[11]. Other major threats for the survival of snakes are habitat destruction, scarcity of food, pollution, road kills etc.[12]. Therefore, it needs continuous monitoring on diversity and distribution of snakes in an ecosystem. The investigation was meant to survey the serpent variety, threats and conservation measures in the Rukhi hill forest.

Materials and methods

Study area: Nayagarh is finite by districts of Angul and Cuttack in North-West, Kandhamal in West, Ganjam in South and Khordha in the East[13]. Rukhi Hill Ranges are placed in the southern side of Nayagarh town which is in $20^0$06'56"–$20^0$07'40"N latitude and $85^0$04'52" – $85^0$06'15"E longitude with an elevation of 200 to 300m. The Rukhi Hill Forest comprises of various types of flora and fauna. The Rukhi Hill also contain hill rocks, as it is placed in the eastern Indian states, the primary forest is tropical moist deciduous forest. The climate of Nayagarh district is portrayed by hot summer and high humidity all the year around and great seasonal precipitation[13]. Three prominent seasons are observed in a year. These are hot and dry

summers, hot and humid rainy season and moderate winter season.

Methodology: A baseline study was conducted in different areas of Rukhi hill forest from June 2018 to March 2019. The data collection was carried out by visual encounter survey. The surveys were conducted in the morning (6:00 to 10:00) and evening (18:00 to 20:00) sessions to observe the both nocturnal and diurnal species. Photographs were taken by Nikon D5300 for perfect identification. Whenever the snakes were sighted, they were handled by using snake hooks and sticks. The observed species were identified by literature and field guide[7,8,14,15].

Results and discussion

After spontaneous field study 14 species (Table-1) were encountered from the hill forest. The study comprised of 4 families and 12 genera. Out of which only 5 species are poisonous (35.71%) and rest are non-poisonous. All the species were marked with IUCN Status and poison status (Table-1). Family Colubridae enjoys the top spot among others with 7 number of species. Followed by 4 species from Elapidae, 2 species from Boidae and only 1 species of Viperidae.

The deadly poisonous serpents found from the study were Spectacled Cobra, Monocled Cobra, Common Krait, Banded Krait and Russel's Viper. The venom of Russel's Viper is hemotoxic, and others have neurotoxic.

Indian Rock Python which comes under Schedule I Part-II on WPA Status was found in this forest. Most of the snakes found in this forest are mainly nocturnal and crepuscular. It is found that most of the favorable habitats for snakes were destroyed by humans. So, the number of species were decreasing day by day. Lack of awareness among people is the main cause of declination of serpent diversity.

Conclusion

The study concluded that only 14 species were observed during study period. Lack of knowledge, fear of bite, mishandling and careless behavior were the main reasons behind the snake killing. Major causes of declination of snake diversity are continuous forest fire causing habitat loss, climate change, illegal expansion of urban area etc. As it is a baseline data the further study may conducted for better result. Whether it is snake or other species, all should be important for ecology. By awareness and lawful action, the depletion of biodiversity may be check which is important for future generation. Otherwise total ecology may disrupt and endemic species of this area may be vanished.

Table-1: Checklist of snakes with IUCN Red list category and poison status.

Common Name	Biological Name	Family	Venomous/Non-Venomous	IUCN Red list Category
Indian Rat Snake	*Ptyas mucosus*	Colubridae	Non-Venomous	LC
Buff Striped Keelback	*Amphiesma stolatum*	Colubridae	Non-Venomous	LC
Checkered Keelback	*Xenochrophis piscator*	Colubridae	Non-Venomous	LC
Bronze back tree Snake	*Dendrelaphis tristis*	Colubridae	Non-Venomous	LC
Twin spotted wolf Snake	*Lycodon jara*	Colubridae	Non-Venomous	LC
Green Vine Tree snake	*Ahaetulla nasuta*	Colubridae	Non-Venomous	LC
Green keelback	*Macropisthodon plumbicolor*	Colubridae	Non-Venomous	LC
Banded Krait	*Bungarus fasciatus*	Elapidae	Venomous	LC
Common Krait	*Bungarus caeruleus*	Elapidae	Venomous	LC
Monocellate Cobra	*Naja kauthia*	Elapidae	Venomous	LC
Spectacled Cobra	*Naja naja*	Elapidae	Venomous	LC
Indian Sand Boa	*Eryx johnii*	Boidae	Non-Venomous	LC
Indian Rock Python	*Python molurus*	Boidae	Non-Venomous	LC
Russell's Viper	*Daboia russelii*	Viperidae	Venomous	LC

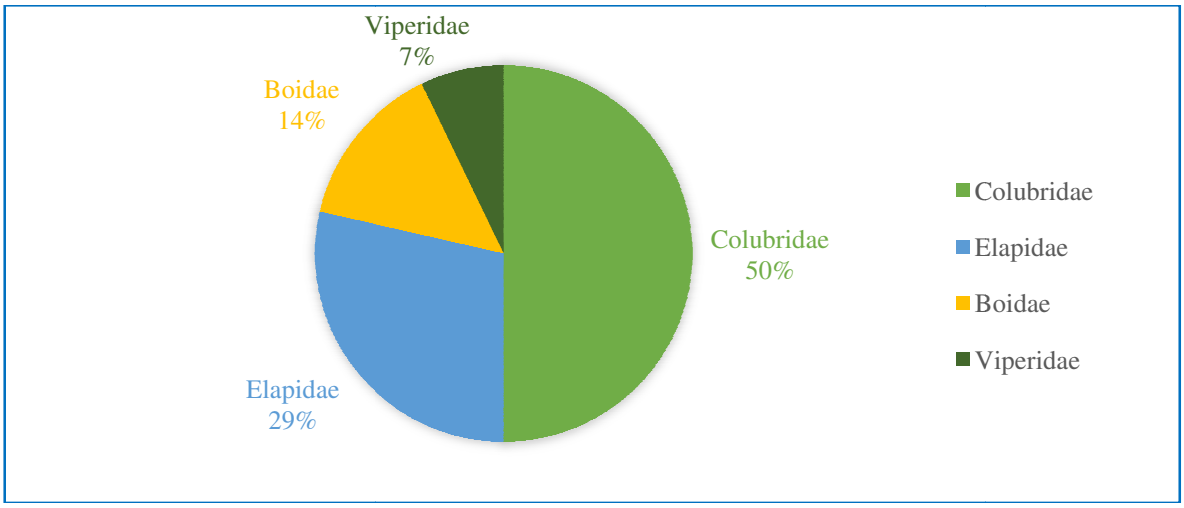

Figure-1: Pie Chart showing percentage of Snake Family observed in Rukhi Hill.

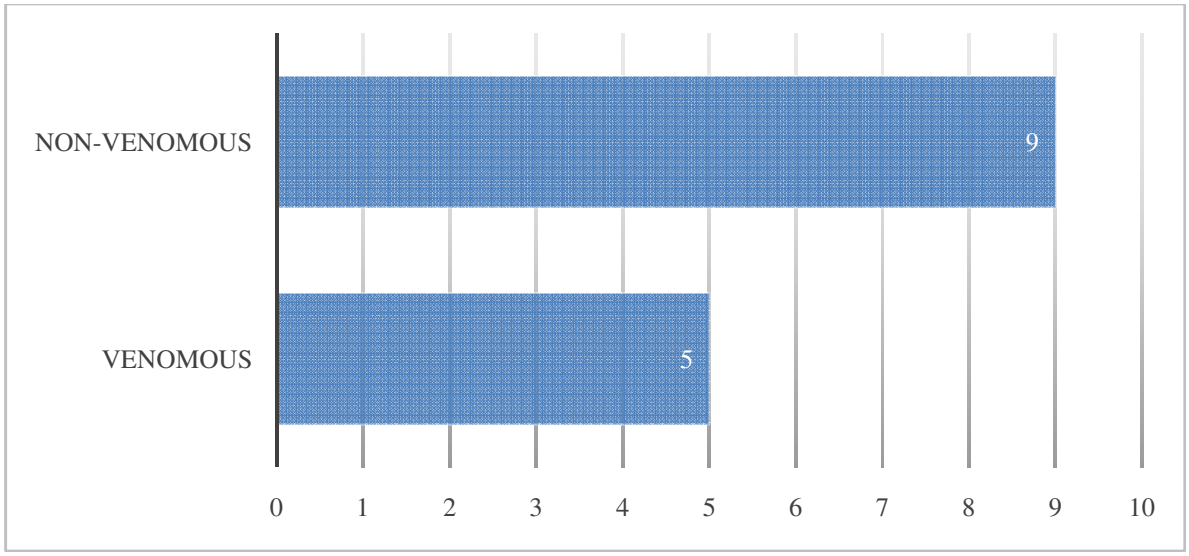

Figure-2: Bar Chart showing Snakes according to their Venom.

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