

Diversity of Snakes in Sarlahi District, Nepal

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Abstract

A total of 21 snake species belonging to 17 genera and 4 families were recorded. Out of 21 species, 2, 14, 4, and 1 belong to family Typhlopidae, Colubridae, Elapidae and Viperidae respectively. They have been categorized as deadly venomous, mild venomous and non-venomous. Among the recorded species 5 were deadly venomous, 4 were mild venomous and the remaining 12 were non venomous. The species of Boidae family was not encountered during the study period.

Key words: Snakes diversity, venomous snakes, Sarlahi District

Introduction

Nepal is unique in geographically, culturally as well as in terms of vegetation and animal diversity. Nepal's rich biodiversity is a reflection of its unique geographical position as well as its altitudinal and climatic variations. The herpetofauna has a wide range of vertical (60m–5490m) and horizontal in distribution. The field of herpetology has always received less priority in Nepal. Scientific investigations concerning the herpetofauna of Nepal have been sporadic and so the information related to the subject is scanty. The first zoogeographical analysis of Nepalese herpetofauna was done by Swan and Leviton (1962) which laid a good basis for further studies. In recent years several herpetologists like Fleming and Fleming (1974), Kramer (1977), Joshi (1985), Nanhoe and Ouboter (1987), Shah and Giri (1991), Schleich (1993), Shah (1995, 1997), Orlov and Helfenberger (1997), Schleich and Kastle (2002), Shah *et al.* (2003), Shah and Tiwari (2004) have given important contribution on the study of snake fauna in Nepal. Sarlahi is

one of the small districts of Nepal having 1259 sq. km in area. Geographically, it is divided into three regions, Churia hills in the north, Bhawar in the middle and Terai in south. It lies in the Central Development Region of Nepal having the height range from 60 m to 659 m above the sea level. The border lines of this district are Hardinath River in the east and Bagmati River in the west. It occupies 0.86% of the total land area of Nepal. Most of the people of this district are poor, illiterate and involved mainly in agricultural activities.

Description of study areas

For the collection of snake species from different areas of Sarlahi district, three study sites were undertaken, viz., Site I – Lalbandi, Site II – Hariwon and Site III – Karmaya (Fig. 1).

Site I – Lalbandi

Lalbandi is in the north-east of Sarlahi district. It is bordered by Dhalkaber - Fuljorbaba jungle, Churia hills and open

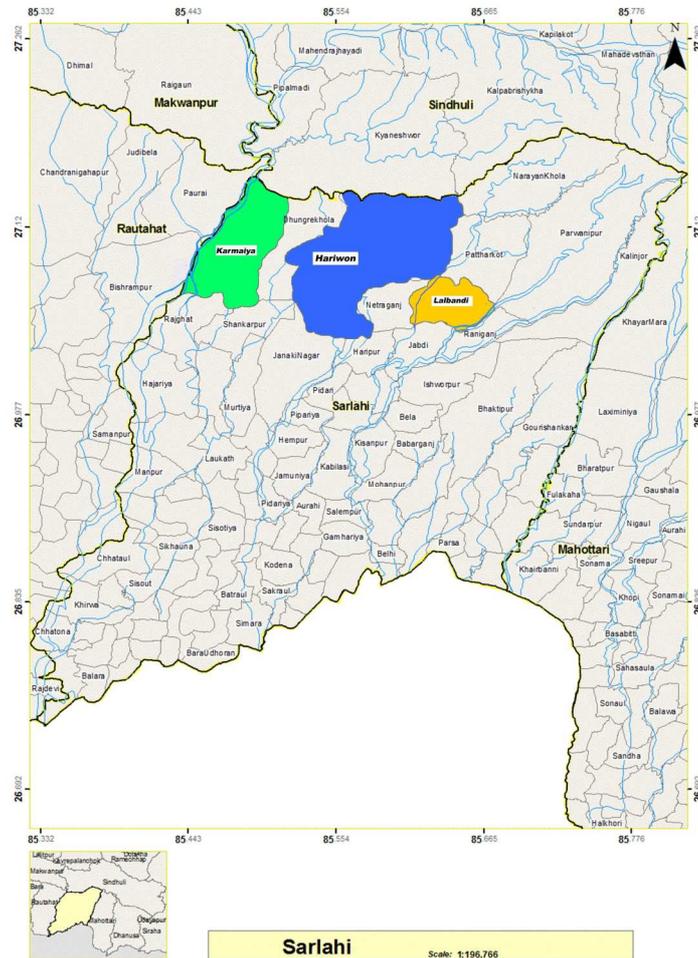


Figure 1. Map of Sarlahi District showing the three study sites.

plain agricultural land in the east, north, and south respectively. It lies between 27° 03' 01.80" to 27° 03' 20.68"N latitude and 85° 38' 34.97" to 85° 37' 27.81" E longitude. Its elevation is 489ft. Most of this VDC is occupied by open plain agricultural land. For the cultivation of vegetables, Lalbandi is famous in Nepal. This VDC is a pocket area for tomato cultivation in the nation. In the north of this VDC, there is a small pocket of forest named Lalbandi forest having the area of 1940 hectares. The main

trees of this forest are Sal (*Shorea robusta*), Khayar (*Acacia catechu*), Satvir (*Asparagus recemosus*), etc.

Site II –Hariwon

Hariwon is a new Municipality formed by the combination of four VDC like Hariwon, Aatroli, Sasapur and Ghudkhauli. It lies between 27° 05' 07.53" to 27° 06' 02.56"N latitude and 85° 34' 24.69" to 85° 31' 17.20"E longitude. The total area of Hariwon municipality is 86.08 sq km and

elevation is 457ft. The north of this municipality has Churia hills, which is 2 km away from the Mahendra highway. Geographically, north of Hariwon is dominated by tertiary unconsolidated and highly erodable sediments where sedimentary rocks, shale and conglomerate are common. In south, clay loam and silty clay are found. Most of the north of Hariwon is covered by community forest where *Shorea robusta*, *Terminalia tomentosa*, *Acacia catechu*, *Asparagus recemosus*, etc. are found. The open plain is agricultural land.

Site III –Karmaya

Karmaya is in the extreme north-west of Sarlahi. It is bordered by Patlaiya jungle in the west, Churia hills in the north and open plain agricultural land in the south and the east. It has an area of 35.928 square km and elevation of 455ft. It lies between 27° 06' 15.62" to 27° 07' 56.21" N latitude and 85° 31' 21.52" to 85° 28' 59.88" E longitude. Bagmati River makes a natural border and separates Sarlahi district from Rautahat district. Similar to the Hariwon, north of Karmaya VDC (Nunthar) has a sedimentary rock, shale and conglomerate, while southern land is covered by fine clay and silty clay. It has good irrigation facilities due to the presence Bagmati River.

Climate

Terai of Nepal experiences tropical climate with three distinct seasons, viz., summer (March – June), monsoon (July – October) and winter (November – February). Most of the part of Sarlahi is plain. The annual maximum temperature of Sarlahi is 31°C whereas annual minimum temperature is 20°C. But sometimes, during summer season, temperature reaches 42°C and during winter season temperature falls to

4°C. Almost 80% of the rainfalls in this district occur during the month of April to September.

Materials and methods

Different materials like digital camera (8 mega pixel), field diary, measuring tape, plastic bags, thread, gloves, hook stick, bag, forceps, syringe and needle, jar and 10% formaldehyde were used.

For the collection of snake species, three sites were selected. They were Site-I (Lalbandi area), Site-II (Hariwon area) and Site-III (Karmaya area). All the sites were visited fortnightly and species were collected with the help of local people. For snake collection, visual encounter survey method was employed with regular visits to study sites and interaction with local people, teachers and students. The survey was conducted in all possible microhabitats such as shade, under boulder and logs, alongside of streams, agricultural field, forest, bushes and human settlements areas during day time from 9 am to 1 pm. People were encouraged to preserve killed snake specimens in 10% formalin or to give a call as soon as possible or to take photograph of any type of snake species found with digital camera or with the help of mobile camera in high resolution. The killed snake species were collected and preserved in 10% formalin for further study. The collected snake specimens were identified by the standard books of Deoras (1965), Shrestha (2001), Daniel (2002), Schleich and Kastle (2002) Shah and Tiwari (2004), etc.

Results

Altogether 21 snake species were recorded (Table 1, Plate 1). These species belonged to 17 genera and 4 families. They represented the smallest bodied (10 cm)

Table 1. List of snake species recorded from different study sites.

S.N.	Scientific name	Common name	Nepali name	Site I	Site II	Site III
1	<i>Ramphotyphlops braminus</i> (Daudin, 1803)	Brahminy worm snake/Common blind snake	Andhara sarpa, Telya sarpa, Ganeule sanp.	+	+	-
2	<i>Typhlops diardii</i> (Schlegel, 1839)	Diard's blind snake	Phusre telya sanp	+	-	-
3	<i>Ahaetulla nasuta</i> (Lacepede, 1789)	Common vine snake	Suga sanp, Udane hareu	-	-	+
4	<i>Amphiesma stolatum</i> (Linnaeus, 1758)	Buff striped keelback	Bagala, Ashara, Harara	+	+	+
5	<i>Atrretium schistosum</i> (Daudan, 1803)	Olivaceous keelback	Panisarp	-	+	+
6	<i>Boiga ochracea</i> (Gunther, 1868)	Common tawny cat snake	Chudeu sarpa	-	+	+
7	<i>Boiga trigonata</i> (Bechstein, 1802)	Common cat snake	Adhoo sarpa, Tirishe, Batasa	-	+	+
8	<i>Dendrelaphis tristis</i> (Daudan, 1803)	Bronzeback tree snake	Sirishe	-	+	-
9	<i>Elaphe helena</i> (Daudin)	Common trinket snake	Singara sarpa	+	+	-
10	<i>Enhydryis enhydryis</i> (Schneider, 1799)	Common smooth water snake	Panisarp, Machhagidhi	+	+	+
11	<i>Lycodon aulicus</i>	Common wolf snake	Dhamiloo sarpa, Buwasesarpa	+	+	-
12	<i>Lycodon jara</i>	Twin-spotted wolf snake	Chichinde sarpa	-	-	+
13	<i>Oligodon arnensis</i> (Shaw, 1802)	Common kukri snake	Sankhad sanp	+	+	+
14	<i>Ptyas mucosa</i> (Linnaeus, 1758)	Asiatic rat snake	Dhaman	+	+	+
15	<i>Xenochrophis piscator</i> (Schneider, 1799)	Chequered keelback water snake	Panisarp, Dhodia sanp	-	+	+
16	<i>Xenochrophis sanctijohannis</i> (Boulenger, 1890)	St. Jhon's keelback water snake	Panisarp, Dhodia sarpa	-	+	-
17	<i>Bungarus caeruleus</i> (Schneider, 1801)	Common krait	Karet, Churia sarpa	+	+	+
18	<i>Bangarus fasciatus</i> (Schneider, 1801)	Banded krait	Gangwari, Panhelokalo Churia sarpa	-	-	+
19	<i>Naja naja</i> (Linnaeus, 1758)	Spectacled cobra	Goman, Nag	+	+	+
20	<i>Ophiophagus hannah</i> (Cantor, 1836)	King Cobra	Raj Goman	-	+	-
21	<i>Daboia russelii</i> (Shaw and Nodder, 1797)	Russell's viper	Baghe sarpa	-	-	+
Total				10	16	14

Symbol: + indicates species encountered and - indicates species not encountered

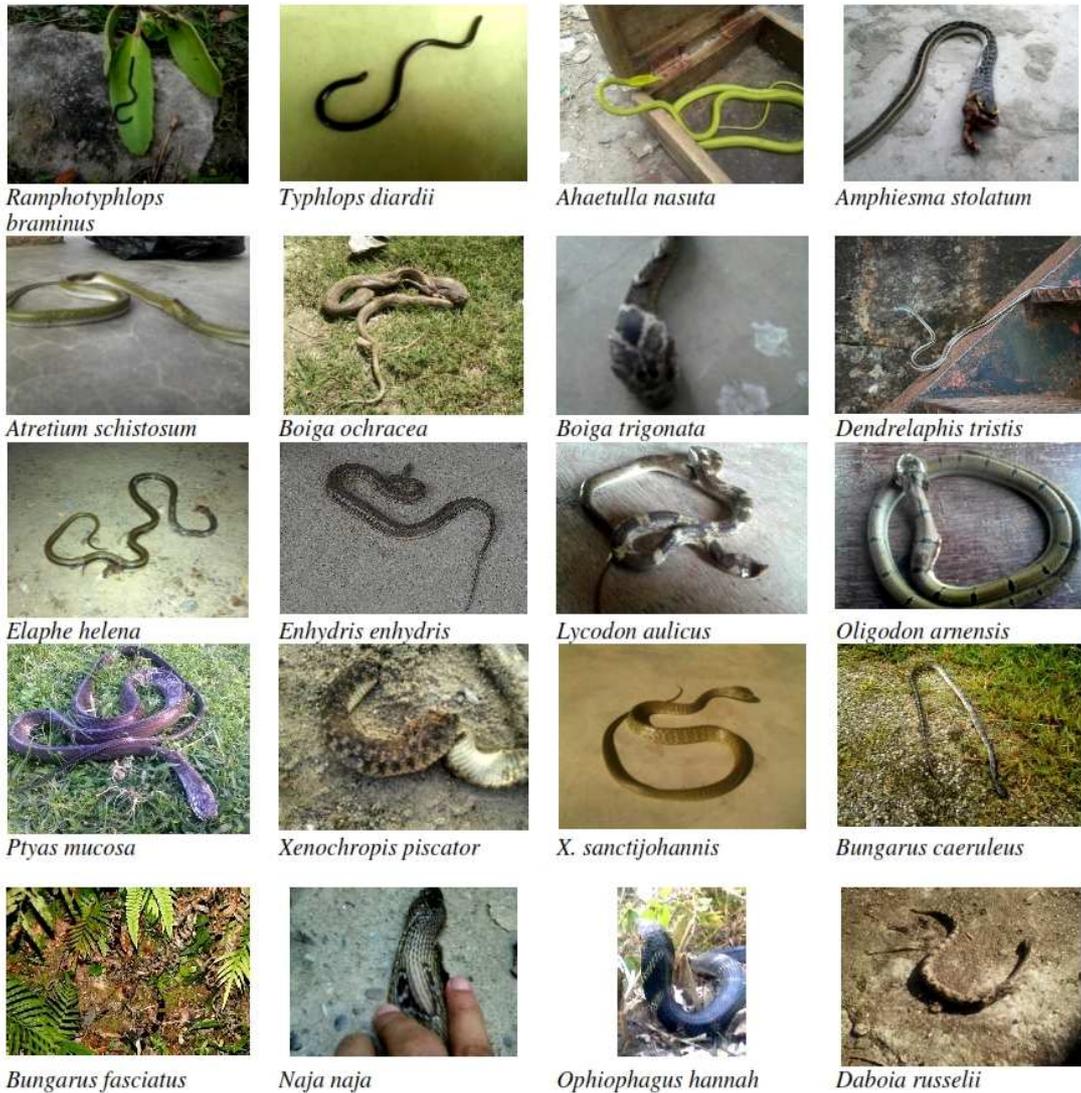


Plate 1. Photographs of snake species from different study sites.

blind snake to the long bodied (175 cm) rat snake. Out of 21 species, two were of Typhlopidae family, fourteen were of Colubridae, four belonged to Elapidae family and one was of Viperidae family. Out of fourteen colubrides, *Elaphe helena* is trinket snake, *Ptyas mucosa* is rat snake, *Oligodon arnensis* is kukri snake, *Lycodon*

aulicus and *Lycodon jara* are wolf snakes, *Dendrelaphis tristis* is bronze back snake, *Enhydris enhydris* is mud snake, *Amphiesma stolatum*, *Atretium schistosum*, *Xenochrophis piscator* and *Xenochrophis sanctijohannis* are keelback snakes, *Boiga trigonata* and *Boiga ochracea* are cat snakes and *Ahaetulla nasuta* is whip snake.

Ahaetulla nasuta, *Enhydris enhydris*, *Boiga trigonata* and *Boiga ochracea* are mild venomous while *Bungarus caeruleus*, *Bungarus fasciatus*, *Naja naja*, *Ophiophagus hannah* and *Daboia russelii* are highly venomous snakes of Nepal. Hence only five were highly venomous, four were mild venomous and the remaining twelve were non-venomous species. Out of 21 species recorded, 16 species were encountered from the Site II - Hariwon, 14 from Site III - Karmaya and 10 species were from Site I - Lalbandi (Table 1).

Discussion

There are about 3000 species of snakes found in the world, out of which 375 species (12.5%) are poisonous (Sharma, 1999). Shah (1998) prepared a checklist of herpetofauna of Nepal in which he recorded 64 snake species. Shrestha, (2001) reported 90 species of snakes from Nepal, out of which 21 species are poisonous. However, no detail survey of the snake fauna of the country has been carried out so far. Nepalese snakes are divided into 5 families, out of which Typhlopidae, Boidae, and Colubridae are non-poisonous, while Elapidae and Viperidae are poisonous.

The present study recorded altogether 21 species belonging to 17 genera and four families. The four families are Typhlopidae, Colubridae, Elapidae and Viperidae. The snakes of Boidae family, recorded from other parts of Nepal, were not encountered in this area during the study period. Thapa and Thapa (2006) reported 14 species of snakes from Biratnagar area. Chhetry (2010) reported 6 species of snakes from Koshi Tappu Wildlife Reserve and its surroundings. Pandey (2010) recorded 31 species from Chitwan National Park. At present survey, highest number of snake

species was recorded from Site-II (Hariwon) and least number of snakes was recorded from site I (Lalbandi). In Hariwon, farmers cultivate the sugarcane in most of the land which provide good habitat for snakes. This may be the reason for the highest number of species recorded in this site. But, in Lalbandi, people are engaged in the cultivation of cash crop such as tomato, cauliflower, brinjal, etc. For these crops, they should plough and clean the land several times in a year and comparatively provide less suitable habitat for snake species. This may be the reason for lowest number of species recorded in Site I (Lalbandi).

Generally, people cannot distinguish the poisonous and non-poisonous snakes. They think every snake is poisonous. So, they kill snakes whenever they meet them. Thus, the snake species are decreasing day by day. For the conservation of snakes in Nepal, public awareness regarding the importance of snake to keep the ecosystem in balanced condition is essential.

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