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## **Snake Biodiversity and Snake Bite Antidotes Used in the Tribal Belt of Siddeswarm Sacred Grove of SPSR Nellore District.**

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### **ABSTRACT**

*State of Andhra Pradesh was considered one of the rich biodiversity states in India. In India more than 216 species of snakes are present. Among them 53 are poisonous. In the present study snake biodiversity was studied in the tribal belt of Siddeswarm sacred grove of SPSR Nellore district. In total 23 species of snakes were identified from seven families. Out of them fourteen were non poisonous and nine were poisonous. Bites were primarily due to the venomous species of the families Elapidae and Viperidae. The common poisonous snakes found here were Indian spectacled cobra (*Naja naja*), common krait (*Bungarus caeruleus*), Russell's viper (*Daboia russelii*) and saw-scaled viper (*Echis carinatus*), Hump-nosed pit vipers (*Hypnale hypnale*).*

*Snake envenomation is a global public health problem, with highest incidence in South India. Inadequate health services, difficult transportation and consequent delay in antivenom administration were the main reasons for high mortality. Adverse drug reactions and inadequate storage conditions limit the use of antivenom. Few medicinal plants, available locally were used widely by traditional healers. However, numerous unexplored plants claimed to be antidotes in folklore medicine. The present article describes the use of various medicinal plants for the management of snake bite in the tribal belt of Siddeswarm sacred grove of SPSR Nellore district.*

**Key words** Snake Biodiversity; Antidotes Ethnobotany; Siddeswaram Sacred Grove

### **INTRODUCTION**

A study on snake biodiversity is important for prevention of fatality due to snake bites. Snake bite often results in two puncture wounds from the animal's fangs (Sonali 2014). This may result in redness, swelling, and severe pain at the area, which may take up to an hour to appear. Vomiting, trouble in vision, tingling of limbs, and sweating may result. Fear following a bite is common with symptoms of a racing heart and feeling faint. The venom may cause bleeding, kidney failure, a severe allergic reaction, tissue death around the bite, or breathing problems. Bites may result in the loss of a limb or other chronic problems. The outcome depends on the type of snake, the area of the body bitten, the amount of venom injected, and the health conditions of the person (Bawaskar 2004). Using of antivenom is the right treatment for snake bite. Due to lack of hospitals in rural areas people tend choose herbal medications from traditional healers. There are some side effects using Anti Venom and its development is time consuming, expensive and requires ideal storage conditions (Meenatchisundaram *et al* 2008.). As alternative treatments herbal antidotes are used widely in villages. There are no reports on the snake biodiversity of SPSR Nellore district. No studies are there on the ethnomedicinal uses of plants for the snake bites from Siddeswarm sacred grove from Local tribes. Hence in the present study snake biodiversity and anti dotes used for various snake Venoms by traditional healers of tribal belt of Siddeswarm sacred grove of SPSR Nellore district were presented.

## METHODOLOGY

Field survey was conducted in Siddeswaram sacred grove near Vempalli Thoka village of Seethramapuram taluk, SPSR Nellore District (Latitude 16.4204; Longitude 81.6569) in identifying different snakes that are there in that area. Ethnobotanical survey was made to collect the mostly preferred plant species by the tribal doctors of Seetharamapuram Taluk of SPSR Nellore district for snake bite. Information on ethno-medicinal plants was collected from two indigenous communities' viz. Yanadies, Yerukalas in eighteen villages under Seetharamapuram taluk of SPSR Nellore district.

## RESULTS

The aim of the present study is to provide a comprehensive picture of the Snake diversity and medicinal plants with anti-snake venom activity that are used by the Siddeswaram sacred tribal people of SPSR Nellore district, Andhra Pradesh.

During survey 23 species of snakes were identified from seven families. Out of them fourteen are non poisonous and nine are poisonous (Table 1). The list of snakes that are present in the Seetharamapuram Taluk are given below. Out of these the fourteen are non poisonous and nine are poisonous.

**TABLE -1. LIST OF SNAKES PRESENT IN SEETHRAMAPURM TALUK**

S.No.	Scientific name	Family	English name	Local name
1	<i>Tropidonotus natrix</i>	Colubridae	Grass snake	Neeti pamu
2	<i>Typhlops braminus</i>	Typhlopidae	Blind snake	Guddi pamu
3	<i>Python molurus</i>	Pythonidae	Indian rock python	Konda chiluva
4	<i>Eryx conicus</i>	Boadae	Common sand boa Double headed snake	Renduthalkaya sikhandi
5	<i>Eryx johnii</i>	Boadae	Red sand boa	Renduthalkaya sikhandi
6	<i>Lycodon striatus</i>	Colubridae	Barred wolf snake	Pasupu patti pamu
7	<i>Amphiesma stolata</i>	Colubridae	Striped keel back	Vanakokila
8	<i>Macropisthodon plumbicolar</i>	Natricidae	Bicolor green keelback	Pasarikapamu
9	<i>Xenochropis piscator</i>	Colubridae	Checkered keelback water snake	Neerukatte
10	<i>Atretium schistosum</i>	Colubridae	Olive keel-back	Nallawahigejilla
11	<i>Ptyas mucosu</i>	Colubridae	Rat snake	Jerripothu
12	<i>Dendrelaphis tristis</i>	Colubridae	Bronze-back tree snake	Mannu pamu
13	<i>Chryopelea ornate</i>	Colubridae	Flying snake or Golden tree snake	Dookudu pamu
14	<i>Dryophis nasuta</i>	Colubridae	Green wine snake or Green whip snake	Chetukuri pamu
15	<i>Elachistodon westermanni</i>	Colubridae	Indian egg eater	Pasirika pamu
16	<i>Ophiophagus Hannah</i>	Elapidae	King cobra	Raja nagu
17	<i>Naja naja</i>	Elapidae	Indian cobra	Naga pamu
18	<i>Trimersurus ramineus</i>	Viperidae	Bamboo pit viper	Patcha pinjara
19	Russell's viper	Viperidae	Blood viper	Rakthapinjara
20	<i>Callophis melanurus</i>	Elapidae	Coral snake	Pagadapu pamu
21	<i>Bungarus fasciatus</i>	Elapidae	Krite	Katla pamu
22	<i>Echis carinatus</i>	Viperidae	Saw-scaled viper	China pinjara
23	<i>Hypnale hypnale</i>	Viperidae	Hump-nosed pit vipers	Kunakatuwa

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## NON POISONOUS SNAKES

### 1. *Tropidonotus natrix* (Grass snake)

It is typically dark green or brown in color with a characteristic yellow collar behind the head, which explains the alternative name ringed snake. The color may also range from grey to black, with darker color.

### 2. *Typhlops braminus*

This snake resembles a worm, growing to a maximum length of 12 cm. It is small and worm-like with smooth shiny scales and a blunt head and tail. They are reddish brown or black and superficially look like earthworms.

### 3. *Python molurus* (Indian Rock Python)

Large, thick bodied snakes have smooth scales and a bright pattern of blotches. It may grow up to 20 feet long and weigh up to 80 kilos. Usually sluggish, they have a peculiar method of locomotion in a straight line, pushing forward with its ribs.

### 4. *Eryx conicus* (Common Sand Boa)

It is a thick and round snake, 1 to 2 feet long. Its tail is very short, sharply tapering, and conical. The head is covered by small scales. It is grey with yellowish-brown blotches on the back forming a sort of irregular chain.

### 5. *Eryx johnii* (Red Sand Boa)

It is having a mental groove, a pronounced angular ridge on the muzzle, a blunt tail and costal scales numbering over 53.

### 6. *Lycodon striatus* (Barred Wolf Snake)

It is a terrestrial slender bodied snake, generally brown in color with many cross-bars.

### 7. *Amphiesma stolata* (Striped Keel back)

A small to medium-sized snake, this is closely related to and resembles the water snakes and is found all over India and up to an elevation of 2,000 mts. in the hills.

### 8. *Macropisthodon plum* (Bicolor green Keelback)

A medium-sized keel-scaled snake found in the forest regions of Seethrapuram

### 9. *Xenochropis piscator* (Checkered Keelback Water snake)

A medium-sized keeled snake found in water tanks and canals.

### 10. *Atretium schistosum* (Olive Keel-back)

It is having a single inter-nasal, 19 costals at mid body and 8 to 9 supra-labials. It lives in water or among the surrounding vegetation. Largely diurnal and feeds mainly on frog fish and crabs.

### 11. *Ptyas mucosu* (Rat Snake)

It is a terrestrial snake. The Rat snake can grow up to 8 feet in length. Colors varied due to different climatic conditions and change in habitats. The Rat snake has black tear marks just below the labial. They have numerous cross bars near the tail.

### 12. *Dendrelaphis tristis*, (Bronze-back tree snake)

It is a species of tree-snakes with a bronze colored line running down its back. It has a pointed head. It feeds mainly on tree geckos, frogs and small birds. It is perfectly camouflaged among the leaves because of its uniform ruddy brown skin. It springs on its prey and feeds largely on lizards and tree frogs and occasionally on birds

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13. *Chryopelea Ornata* (Flying snake or Golden tree snake)

This beautiful and harmless black snake has narrow pale greenish-yellow cross bars. It prefers trees but also frequently spotted in the grass and on low bushes.

14. *Dryophis nasuta* (Green Wine Snake or Green whip snake)

A medium to large-sized snake found having Parrot green in color with faint yellow and blue lines. It moves very fast from branch to branch on trees and bushes.

### POISONOUS SNAKES

1. *Elachistodon westermanni* (Indian Egg eater)

Generally less than 1 m in length, it is a slender grey-brown snake with two V-shaped markings on the top of its head and a regular pattern of dark markings along its back.

2. *Ophiophagus Hannah* (King Cobra)

The body is blackish brown with lighter bands running throughout its entire length.

3. *Naja naja* (Indian Cobra)

One of the most poisonous snakes found in India, the cobra has the most distinctive features as its hood.

4. *Trimersurus gramineus* (Bamboo pit viper)

It is having a loreal pit (heat sensitive pit enabling the snake to locate and capture its prey) snake has a glossy green back and yellowish white bottom.

5. *Russell's viper* (*Daboia =Vipera russelli*) The head is flattened, triangular and distinct from the neck. The snout is blunt, rounded and raised. The nostrils are large, in the middle of a large, single nasal scale. The lower edge of the nasal touches the naso-rostral. The supra-nasal has a strong crescent shape and separates the nasal from the naso-rostral on the anterior. The rostral is as broad as it is high. The body is stout, the cross-section of which is rounded to cylindrical. The dorsal scales are strongly keeled; only the lower row is smooth.

6. *Callophis melanurus*

This is having blunt snout with widely spaced nostrils. Eyes are small brown in color Neck is not conspectus.

7. *Bungarus fasciatus* (Krite)

It is having prominent yellow color bands on the body. Highly poisonous. Black spot is present on head. It is canabolic.

8. *Echis carinatus* (Saw-scaled Viper)

Head distinct from neck, snout very short and rounded. The nostril between three shields and head covered with small keeled scales. They are ovoviviparous.

9. *Hypnale hypnale* (Hump-nosed pit vipers)

Body is stout and have a wide head. The snout is pointed and turned upwards, ending in a hump. The frontal, supraoculars, and parietal shields are large, but those on the snout are small and irregular. The color pattern is grayish with heavy brown mottling,

overlaid with a double row of large dark spots. The belly is brownish or yellowish with dark mottling. The tip of the tail is yellow or reddish.

**TABLE -2**
**LIST OF MEDICINAL PLANTS USED AS ANTIDOTE FOR SNAKE BITE BY THE TRIBAL DOCTORS OF SIDDESWARAM SACRED GROVE, SEETHRAMPURAM TALUK SPSR NELLORE DISTRICT A.P.**

S.No	Plant	Family	Part used	Local name
1	<i>Acalypha indica</i>	Euphorbiaceae	Leaf	Pippenta
2	<i>Achyranthus aspara</i>	Amaranthaceae	Fruit	Uthareni
3	<i>Allium sativum,</i>	Liliaceae	Bulb	Yerra gadda
4	<i>Anacardium occidentale</i>	Ancardiaceae	Bark	Zeedi
5	<i>Andrographis paniculata</i>	Acanthaceae	Leaf	Nelavemu
6	<i>Aristolochia bractata</i>	<i>Aristolochia</i>	Root	Gadida gadapa
7	<i>Aristolochia indica</i>	<i>Aristolochia</i>	Root	Eswari
8	<i>Boswellia dalzielii</i>	Burceraceae	Stem, bark	Guggilam
9	<i>Clerodendrum viscosum</i>	Verbenaceae	Stem	Bharangi
10	<i>Cordia verbenacea</i>	Boraginaceae	Leaf	virigi
11	<i>Curcuma longa</i>	Zingiberaceae	Rhizome	Pasupu
12	<i>Dichrostachys cinerea</i>	Mimosaceae	Root	Nella jammi
13	<i>Dipteryx alata</i>	Fabaceae	Bark	Suvarnagadda
14	<i>Eclipta prostrate</i>	Verbinaeaceae	Stem	Reddivari nanubalu
15	<i>Ficus religiosa</i>	Moraceae	Root	Ravi
16	<i>Hemidesmus indicus</i>	Apocynaceae	Root	Sugandhapala
17	<i>Mangifera indica</i>	Ancardiaceae	Bark	Mamidi
18	<i>Mucuna pruriens</i>	Fabaceae	Seed	Dulagondi
19	<i>Piper longum</i>	Piperaceae	Fruits	Pippallu
20	<i>Rauwolfia serpentine</i>	Apocynaceae	Root	Sarpagandhi
21	<i>Strychnus nux vomica</i>	Loganiaceae	Stem	Vishamushti, Nagareni
23	<i>Tamarindus indica</i>	Leguminosae	Seed	Chintha
24	<i>Vitex nigundo</i>	Lamiaceae	Bark	Vavili
25	<i>Mimosa pudica</i>	Fabaceae	Leaf	Athapathi

During the survey a total of 25 plant species belonging to 25 genera and 17 families were identified as being used for treatment of snakebite. The plants were enumerated alphabetically according to their scientific name, local name, family, parts used were presented in Table -2. Maximum number of medicinal plants used for snakebite was recorded under the family Apocynaceae and 68% of plants were used orally or internally, where as 32% of plants were externally applied to the affected area.

**DISCUSSION:**

Plants and their extracts have been used for the treatment of snake bite in most areas where venomous species are endemic (Houghton and Osibogun, 1993). In spite of this wealth of Ethnobotanical information only a relatively few species have been identified and tested scientifically for anti venom activity and the species where an active compound has been isolated are very few in number. This report lists the plants used by the traditional healers of tribal belt of Siddeswarm sacred grove of SPSR Nellore district against snake bite in India.

The most commonly used species for treatment of snakebite was *Rauvolfia serpentina* with highest use value among tribal's followed by *Aristolochia indica*, *Curcuma longa*, *Achyranthes aspera* and *Mimosa pudica*. The plant with very less use value reported from study area was *Andrographis paniculata*, *Asparagus racehorses*, *Musa paradisiaca*, *Nyctanthes arbortristis* and *Piper longum*. Further work is needed to elucidate the possible mechanism of action of these antidotes.

Although many plants may not neutralize the venom itself, yet they may be used to treat snake bite because they alleviate some of the symptoms (fear and panic) by tranquilizing

Compounds such as Proserpine. Some plant species are grown around houses or their extracts sprinkled on the floor to repel snakes. e.g., Garlic (*Vellulli -Allium sativum*, Liliaceae) and Garlic vine (*Pseudocalyma alliceaum*, Bignoniaceae).

Some plants may stimulate the immune system thus having beneficial effects, helping in removal of the venom. In this context, *Aristolochia* species (Aristolochiaceae) is noteworthy. It contains Aristolochic acid which is an immune stimulant. Plants with analgesic and anti-inflammatory effects may lessen the inflammation and pain caused by snake bites. e.g., *Andrographis paniculata* *Aristolochia indica* is an excellent blood purifier, used as diuretic, heart stimulant and against skin diseases. Paste of fresh leaves or roots of *A. indica* is applied externally over the bitten part. 10 – 15 ml fresh juice from leaf/ root with a pinch of black pepper is administered orally 6 times a day. The whole plant of *Aristolochia. indica* (1 part), bark of *Ficus religiosa* (Moraceae), 1 part and powder of black pepper (1 part) are mixed together and used as nasal inhaler to recover from the coma caused by snake bite.

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