

## **Recent studies on the biodiversity of snakes in Palghar region, Thane, Maharashtra, India**

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### **ABSTRACT**

*Snakes are abundant all over the world except in the Arctic, New Zealand and Ireland. It is postulated that there are about 3000 species of terrestrial snakes in the world and they are predominant in the warm climates and lush-green regions of the tropics. About 278 species are found in India out of which 58 species are venomous. The snakes are objects of fascination for studies since time immemorial. The body of snake is often modified to suit its ecological conditions. These are particularly noticed as fossorial, arboreal, aerial, aquatic & terrestrial forms. Many snakes have been spotted in and around their habitats during our visit / studies or during stress calls made by residents to snake charmers/ rescuers/NGO's etc. in Palghar. Palghar is an upcoming town and a Municipal Council in Thane district in Maharashtra, situated about 87kms from Mumbai. It is a prominent region with pleasant greenery, soothing environment surrounded by trees, shrubs and other vegetation in the hilly terrains, plains and adjacent areas of the nearby shore. Recently this region is rapidly undergoing industrialization, infrastructural development including townships etc. and as such these areas are prone to habitat loss due to which different types of snake including venomous, semi-venomous, non-venomous are being noticed in the residential areas during monsoons and winter seasons. The present studies are an attempt to evaluate the information, occurrence, abundance & species richness and further assist in the knowledge, awareness and conservation of snake fauna in this region since there is acute paucity of established work and data on this subject till date.*

**Keywords:** snakes, venomous, arboreal, lush-green, habitat.

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### **INTRODUCTION**

Snakes are extremely well- adapted to their habitats namely aquatic, fossorial, arboreal and other terrestrial forms observed in this region. The variation of their sizes, shapes and colours are generally due to the adaptive radiation in mode of life [9]. Snakes are intrinsically fascinating and form an important component of the biota. It is natural that their curious mode of propulsion, venom and constricting mechanism have made them an important group of predators and the interactions maintain a natural balance in the forest and deserts, the plains and hills of India [23,24]. The advent of man appears to have increased the hunting abilities as tea plantations, paddy fields, village huts and city warehouses provided new opportunities for worms and insects, frogs, birds, rats, mice, etc. many of which increased in the area due to these habitat & safe houses and subsequently are an easy prey for snakes [5,2]. Such expansion and also changes in their food supply apparently caused shifts in the kinds and density of snake population as well [25]. The snakes found in India show great biodiversity and their length varies from 6mm to 10 m, while weight ranges between few grams to several kilograms [23].

Snakes have formed an object of awe and curiosity in all lands. In India they have been associated with mysticism, apart from being objects of fear (Deoras, 1963). Snakes are not yet seriously considered as agents of human disease and the scientific insights provided by the clinical phenotype of human envenoming have been ignored for a long time [21]. There are records in the Ayurveda which pertain to snake venom, particularly the cobra venom. Snakes occupied deserts, forests, marshy, swampy places, lakes, streams and rivers of difficult terrains [15]. Fifteen families are currently recognized, comprising 456 genera and over 2,900 terrestrial species. They range in size from the tiny, 10 cm long thread snake to pythons and anacondas of up to 7.6 meters (25 ft) in length [22].

The biodiversity refers to the different genera and species of organisms present in an area. The degree of species diversity varies from one ecosystem to the other [26]. India is very rich country in terms of the flora and fauna present in the natural ecosystem. About 3500 species of snakes are recorded on earth inhabiting both land and sea of which about 375 are venomous [6].

## MATERIALS AND METHODS

Well-trained snake-catchers/charmers or snake rescuers from different localities of Palghar (Palghar, Manor, and Saphale) had captured the snakes that have been sighted during visits or randomly or on request of local people when snakes were observed in their houses or in and around their areas. After catching the snakes, their characteristics, predominant features were noted, photographed and identified as per Deoras [4], Romulus Whitaker [5] and Khair [20]. Subsequently the captured snakes were released in the forest area.

## RESULTS AND DISCUSSION

An annotated checklist of snakes is prepared on the basis of the collected information from studies/survey during 2011-2013

Sr. No.	Common Name	Scientific Name	Family
<b>Non-Venomous Snakes</b>			
1	Worm Snake	<i>Typhlopsbraminus</i>	Typhlopidae
2	Beaked Worm Snake	<i>Rhinotyphlusacutus</i>	Typhlopidae
3	Indian Rock Python	<i>Python morulus</i>	Boidae
4	Sand Boa	<i>Eryxconicus</i>	Boidae
5	Red Sand Boa	<i>EryxJohnii</i>	Boidae
6	Common Trinket Snake	<i>ElapheHelena</i>	Colubridae
7	Indian Rat Snake	<i>Ptyasmucosus</i>	Colubridae
8	Banded Racer	<i>Argyrogenafasciolatus</i>	Colubridae
9	Slender Racer		Colubridae
10	Banded Kukri Snake	<i>Oligodonarnensis</i>	Colubridae
11	Bronzeback	<i>Dendrelaphistris</i>	Colubridae
12	Common Wolf Snake	<i>Lycodonaulicus</i>	Colubridae
13	Dumerils black headed Snake	<i>Sibynophissubpunctatus</i>	Colubridae
14	Checkered Keelback Water Snake	<i>Xenochropis piscator</i>	Colubridae
15	Striped Keelback	<i>Amphiesmastolata</i>	Colubridae
<b>Semi Venomous Snakes</b>			
16	Glossy Marsh Snake	<i>Geradaprevostiana</i>	Colubridae
17	Common Cat Snake	<i>Boigatrigonata</i>	Colubridae
18	Vine Snake	<i>Ahaetullanasuta</i>	Colubridae
<b>Venomous Snake</b>			
19	Common krait	<i>Bungaruscaeruleus</i>	Elapidae
20	Slender Coral Snake	<i>Calliophismelanurus</i>	Elapidae
21	Spectacled Cobra	<i>Najanaja</i>	Elapidae
22	Mallaca Sea Snake	<i>Hydrophiscaeruleus</i>	Elapidae
23	Russells Viper	<i>Daboiarusselli</i>	Viperidae
24	Walls Sind Crai	<i>Bungarussindanuswalli</i>	Elapidae
25	Saw Scaled Viper	<i>EchisCarinatus</i>	Viperidae

### Non Venomous Snakes

#### 1. Worm Snake

Scientific Name- *Typhlopsbraminus*

Common Blind Snake

Hindi-Andha Samp

Marathi- Danav, Kadu

Distribution- All over the India.

Length- 170-180 mm

**Distinctive Characters-**

1. Snake is brown with a shining chocolate hue above, lighter below and the head tail region slightly whitish.
2. It is found in rotting vegetation and is sometimes recovered from uncleaned bathrooms in rural homes.
3. Superficially they look like earthworm; the tail is similar to the blunt head, but bears tiny spines.
4. The eyes are barely visible dots and covered by scales.

**2. Beaked worm Snake**

Scientific Name: *Rhinotyphlus acutus*

Distribution: South of Ganges basin and South of Rajasthan, range extends upto Baroda.

**Distinctive features-**

1. Head same width as body.
2. Snout pointed with large, hooked beak like scale.
3. Nostrils below the beak.
4. Tiny scale covered eye visible as black dot.
5. Glossy brown above distinctly paler below.
6. Short tail ends in spine.

**3. Indian Rock Python**

Scientific Name-*Python morulus*

Hindi, Marathi – Ajgar

Distribution – Throughout India

Length- 7000 mm

**Distinctive character-**

1. It is heavily bodied, smooth scaled snake with a lance shaped head and short tail.
2. The bright, blotched pattern may be yellowish to dark brown.
3. The underside is whitish, yellowish or light orange.
4. These snakes are equipped with heat sensors, small slits near the nostrils.

**4. Sand Boa**

Scientific Name- *Eryx conicus*

Hindi- Dumuka

Marathi – Durkya Ghonas

Distribution – All over India

Length- 50 cm

**Distinctive character-**

1. The overall colour of the common sand boa varies from yellowish white to dark brown with irregular blotches all over the body.
2. They are stumpy snake with a very rough tail and a square nose.
3. Superficially they resemble like a Russell's viper.

**5. Earth Boa**

Scientific Name- *Eryx johnii*

Hindi – Domuhi

Marathi – Mandul

Distribution – Throughout the drier parts of India

Length- 1 meter

**Distinctive Characters-**

1. The overall colour of the Red sand boa varies considerably, from reddish brown and speckled grey or yellowish to black.
2. The thick body is well adapted for burrowing.
3. The shovel shape nose and a tail so blunt that it appears to have been chopped off make them easy to recognize.

**6. Common Trinklet Snake**

Scientific Name: *Elaphe Helena*

Hindi: Alankrat Saap

Marathi: Taskar

Distribution: All over India

Length: 70cm

**Distinctive Character:**

1. It is tan and chocolate brown with two prominent dark stripes on the later part of the body and light band light band and checks on the fore part.
2. Two short and dark lines on the either side of the neck may join medially to form an inverted V
3. Underside is pearly white
4. The scales are smooth and glossy

**7. Indian Rat Snake**

Scientific Name: *Ptyasmucosus*

Hindi: Dhaman

Marathi: Dhaman

Distribution: All over India

Length : 2 mtrs

**Distinctive character:**

1. Rat snake may be light yellow (on the plains) to jet black in the hills and many shades of green, olive or brown in between.
2. The underside often has cross bars that are quite prominent.
3. Lower lip often has black horizontal lines.
4. The body is uniformly coloured but the skin bears interscale markings which show up when the snake puffs itself up in defence.

**8. Banded Racer**

Scientific Name: *Argyrogenafasciolatus*

Marathi: Dhool Nagin

Distribution: Plains throughout most of India

Length: 75 cms

**Distinctive character:**

1. It is light or dark brown, younger ones have white cross bands, regularly placed.
2. The head is little wider than the neck, the nose slightly pointed.
3. The scales are smooth but not glossy.
4. The underside is white or yellowish.

**9. Slender Racer**

Scientific Name: *Colubergrasilis*

Hindi- Dumuka

Marathi – DurkyaGhonas

Distribution – Maharashtra, Madhya Pradesh

Length- 33 inches

**Distinctive character-**

1. It is light greyish brown above with narrow white black edge, cross bars which expand on the outer sides of the body and tail.
2. A bar across the snout in front of the eye and forward forming V shaped marks on the top of the head.
3. Lower parts whitish or yellowish, the outer margins of the ventral are with black spots.

**10. Banded kukri Snake**

Scientific Name: *Oligodonarnensis*

Hindi: Dumuka

Marathi: DurkyaGhonas

Distribution: All over India

Length: 35 cm

**Distinctive character-**

1. Banded Kukris are reddish or greyish brown with 10-20 black or dark brown bands.
2. The top of the head has a distinct chevron or arrow head design.

3. The underside is white.
4. The scales smooth and glossy, head thin with a blunt tip, eyes round pupilled.
5. Kukri snakes get their name from their sharp, curved teeth, perfect for holding strong prey such as geckos.

**11. Bronze back Tree Snake**

Scientific Name: *Dendrelaphistris*

Marathi: Ruka

Distribution: Throughout India

Length : 1 m

**Distinctive character-**

1. It is longer and slender with flat heads and large eyes.
2. The sides are dark brown or black with wide light bronze stripes down the centre of the back.
3. The underside is whitish, grey or light green.
4. The outer edges of the belly scales are notched, forming a fold on either side of the body which serves the snake when it is climbing.

**12. Common Wolf Snake**

Scientific Name: *Lycodonaulicus*

Hindi: Kawadiwala

Distribution: All over India

Length: 30 cm

**Distinctive character-**

1. It is grey, brownish or black with 10-20 thin white or yellow bands.
2. The jet black eyes are protruding slightly and the pupil is invisible.
3. The head is flattish and somewhat pointed; the scales are smooth and slightly glossy.
4. The underside is white.

**13. Dumerils Black Headed Snake**

Scientific Name- *Sibynophissubpanctatus*

Distribution –South of Rajasthan and south of Ganges Valley

Length- 460 mm

**Distinctive character-**

1. Pale brown above, with a vertebral series of small round black spots.
2. Rostral Scale nearly twice as broad as deep.
3. Head and nape dark brown or black; lips, *canthus rostralis*, a transverse line between the eyes, and two broad cross-bands, one in front and one behind the nape.

**14. Checkered Keelback**

Scientific Name: *Xenochropis piscator*

Hindi: Pani Samp

Marathi: Pandiwad

Distribution: All over India

Length: 60 cm

**Distinctive character-**

1. Vary in colour from black with light markings to bright yellow colour with the characteristics black and white Checkered pattern.
2. The one or two black eye streaks are distinctive and head is obtusely pointed and distinct from neck.
3. Underside is usually shiny and pure white.

**15. Striped Keelback**

Scientific Name- *Amphiesmastolata*

Hindi- Dumuka

Marathi – DurkyaGhonas

Distribution – All over India

Length- 40 cm

**Distinctive character-**

1. It is closely resembled the water snake
2. The overall colour is light or dark brown with two tan or yellow stripes running down the body length, these stripes are especially bright on the last half of the body.
3. The head is light brown, and the sides of the head, lip area and chin are white or yellow.

**Semi venomous Snakes****16. Glossy Marsh Snake**

Scientific Name- *Gerarda Prevostiana*

Distribution – All over India

Length- 525mm

**Distinctive character-**

1. Colour dark olive above.
2. Three outer rows of scales whitish, upper lip white.
3. Rostral dark olive, ventrals and sub caudals whitish, with dark edges.

**17. Common Cat Snake**

Scientific Name- *Boigatrigonata*

Marathi – Manjarya

Distribution – All over India

Length- 65 cm

**Distinctive character-**

1. The common cat snake is thin with a long body and a tail that tapers to a fine point.
2. The colour is light brown or tan with a darker pattern of zig-zag markings
3. The top of the head has a clear Y mark.
4. The bottom side is whitish or tan, sometimes with tiny spots on each belly scale
5. The scales are smooth but not glossy.

**18. Vine Snake**

Scientific Name- *Ahaetullanasutus*

Distribution – All over India

Length- 1meter

**Distinctive character-**

1. Vine snakes are long and thin with very pointed heads. the body is uniform parrot green often with a thin white or yellow line separating the black scales from the belly scales.
2. The underside is light green or yellow the scales are smooth but not shiny.

**Venomous Snakes****19. Common Krait**

Scientific Name- *Bungarus caeruleus*

Hindi- Karayat

Marathi – Maniyar

Distribution – All over India

Length- 1 meter

**Distinctive character-**

1. Common Kraits are smooth, glossy bluish-black snakes with rounded heads slightly distinct from the neck.
2. There are normally about 40 thin white cross bands.
3. The underside is white.

**20. Slender Coral Snake**

Scientific Name- *Callophism melanurus*

Hindi- Ritugana

Marathi – Raat

Distribution – Low hilly regions of Maharashtra, Nagpur District, Dharwar District of Karnataka, Kerala, Coimbatore and Annamalai in Tamilnadu.

Length- 25-35 cm

**Distinctive character-**

1. It is light brown and faintly speckled.
2. The head and neck are black with two conspicuous yellow spots on the top of the head.
3. There is a ragged black ring at the tail base and the tail tip.
4. The underside is uniform pinkish red , bright scarlet at vent, and the underside is slightly bluish.
5. The scales are smooth and slightly glossy.

**21. Spectacled Cobra**

Scientific Name- *Najanaja*

Hindi- Nag

Marathi – Nag

Distribution – All over India

Length- 1 meter

**Distinctive character-**

1. It is smooth scaled snake with black eyes, wide neck and head and medium body.
2. Colouring varies from black or brown to yellowish white.
3. The underside is usually white or yellowish with a wide dark neck band.
4. The famous hood marking of the classic design, shows a connected pair of rings.

**22. Mallaca Sea Snake**

Scientific Name: *Hydrophiscaeruleus*

Hindi- Samudrasarp

Marathi Samudrasarp

Distribution – All over India

Length- 820 mm

**Distinctive character-**

1. The snakes are faint, sky blue above and white on ventral side.
2. There are about 50-60 broad dark cross bands dorsally which taper down the ventral side.
3. The body is compressed posteriorly.
4. The flat tail is shaped like a paddle.

**23. Russell's Viper**

Scientific Name- *Dabiorusselli*

Hindi- Kander

Marathi – Ghonas

Distribution – All over India

Length- 1 meter

**Distinctive character-**

1. Russells viper are heavy, rough scaled snakes with vertical eye pupils and generally a very a bright pattern.
2. The body colour is usually brown or yellowish and the pattern is composed of dark,round spots edged with white and black.
3. The underside is white in the western, partly speckled in the southeastern and heavily speckled in the northeastern races.

**24. Walls Sind Krait**

Scientific Name: *Bungarussindanuswalli*

Length- 4 feet

**Distinctive Character-**

1. Pale shiny Yellow lower lip and neck is main feature of this species.
2. Black body with Milky White bands.
3. Top scale row is Hexagonal in shape.
4. Subcaudal scales are undivided.

**25. Saw Scaled Viper**

Scientific Name: *Echiscarinatus*

Hindi- Diar



Marathi – Fursa

Distribution – All over India

Length- 40 centimeter

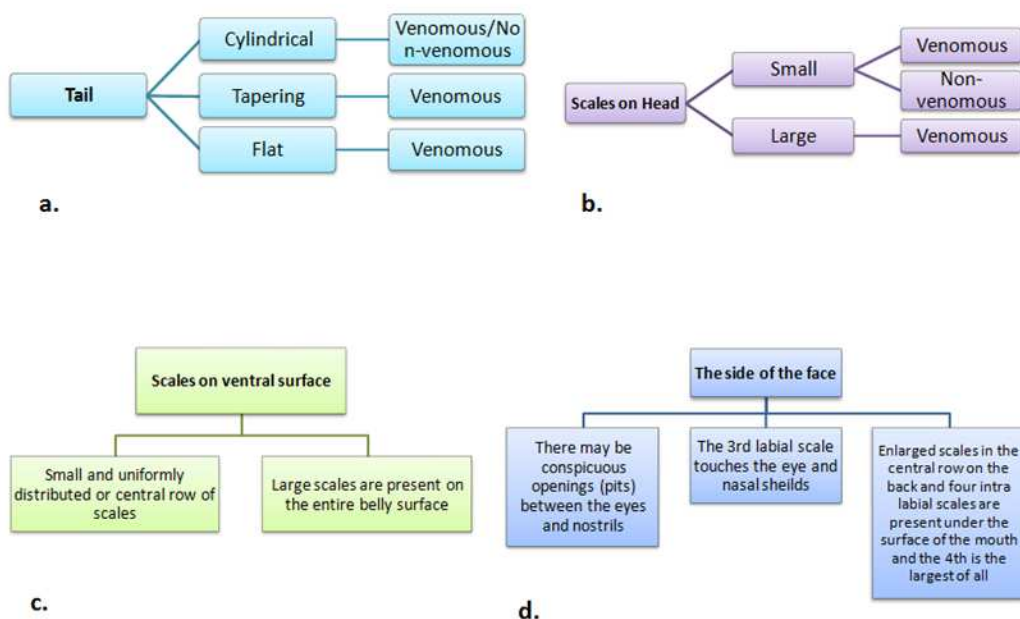
### Distinctive character

1. Small brownish body of dry appearance.
2. Mostly Found under rock and in dry areas produces sound like saw on disturbing by mutually rubbing scales on planks.
3. Arrow shaped mark on the top of the head is also identification.

**Table 2: Morphological distinction between venomous and non-venomous snakes [1]**

a. Differentiation based on tail morphology; b. Difference in scales present on the Head; c. Difference in scales present on the ventral surface for non-venomous and venomous;

d. Difference in the side profile of the faces for venomous snakes(pit viper, cobra, krait)



### CONCLUSION

During our studies we have observed 25 spp. of snakes amongst which 15 were non-venomous, 3 semi venomous and 7 venomous snakes. The area with lush green vegetation, hilly terrain, adjacent sea and mangroves forms a suitable habitat for other reptilians also but they are under threat due to Industrialization and Infrastructural development in these areas. Presently many snakes have made their appearance in an around areas with proximity to human population due to loss of habitats and environmental stress.

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