

Annotated notes on Ophiological Studies of India.

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Abstract

Snakes are carnivorous, limbless & elongated serpents (Squamates), are ectotherms, amniotes, having scales.

Snakes are found on all continents except Antarctica, Hawaii, Greenland, Iceland, Ireland.

Barbados snake (Thread snake) is smallest (10 cm) and Python Reticulated (7 meters) is largest.

Some snakes are Poisonous and others are nonpoisonous.

Ophiological studies were done in semiarid regions of Rajasthan .5 years (April 2017 to March 2022) studies were carried out in

Ajmer and surrounding areas. Night studies, search, dorsal & ventral scales, plates, tail studies were carried out more than 10

species were studied.

Key words: Snakes, Diversity, Rajasthan, INDIA.

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I. Introduction

Snakes belong to Kingdom: *Animalia*, Phylum: *Chordata*, class: *Reptilia*, order: *squamata*, suborder: *serpents*, family: *elapidae*.

(Laurenti, 1768).

Spectacled cobra (*Naja naja*) is fatal snake, its venom is neurotoxic.

Saw scaled Viper (*Echis carinatus*) is deadliest snake. Sochurek's saw scaled viper (*Echis carinatus sochureki*),

Russells viper (*Daboia russelii*), Krait (*Bungarus caeruleus*), Sind krait (*Bungarus sindanus*), Spectacled cobra (*Naja naja*),

Sand Boa (*Eryx johnii*), Sand Boa (*Eryx conicus*), Rock Python (*Python molurus*), Rat Snake (*Ptyas mucosa*), Cat Snake (*Boiga*

Trigonata), *B. forsteni*, tree snake (*Dendrelaphis tristis*), Green vine snake (*Ahaetulla nasuta*), Wolf snake (*Barred*, *Lycodon striatus*),

Egg Eater (*Elachistodon westermanni*), Keelback, *Fowlea piscator*), Wolf snake (*Lycodon qulicus*), Kukri (*Oligodon arnensis*), Russels kukri (*Oligodon taeniolotus*), keelback (*Amphiesma stolata*),

Laudankia vine snake (*Ahaetulla laudankia*), Awl headed (*Lytorhynchus paradoxus*), Gunthers Racer (*Platyceps gracilis*),

Sand snake (*Psammophis schokari*), Trinket (*V collared*) (*Coelognathus Helena nigriangularis*), Royal Snake (*Spalerosophis arenarius*), Water

Snake (*Siebolds*) (*Ferania sieboldi*), Brahmini snake (*Indotyphlops braminus*), Worm snake (beaked) (*Grypotyphlops acutus*), Racer (*Glossy Bellied*) (*Platyceps ventromaculatus*), Sand snake (*Leiths*)

Psammophis leithii, Dumerils Black headed (*Sibynophis subpunctatus*),

Racer (*Banded*), *Platyceps plinii*.

II. Methods

Field observations were made from march 2019 to April 2022 in different parts of Ajmer i.e. East, West, North & South, with varied habitats Fields, Agriculture areas, deserts, Cultivated areas & mountains.

III. Observations & Results

Snakes were visible during April to July August ,September .Snakes are cold blooded vertebrates ,They are not visible October ,November to February .They hibernate during winter season .They become inactive during winter months .Most snakes were seen during Rainy season . Snakes are present in Desert places more than cold places .

Following snakes were found during Observation period :

1. Spectacled Cobra (*Naja naja*)

Binocellate cobra ,belongs to Chordata ,Order Squamata ,family Elapidae ,its venom is neurotoxic .



Image 1. *Naja naja* .

2. King Cobra (*Ophiophagus Hannah*)

Elapid snake ,native to S.E Asia. World largest (longest) venom snake(4 m). belongs to family Elapidae ,*Ophiophagus* genus.

Its conservation status is vulnerable.

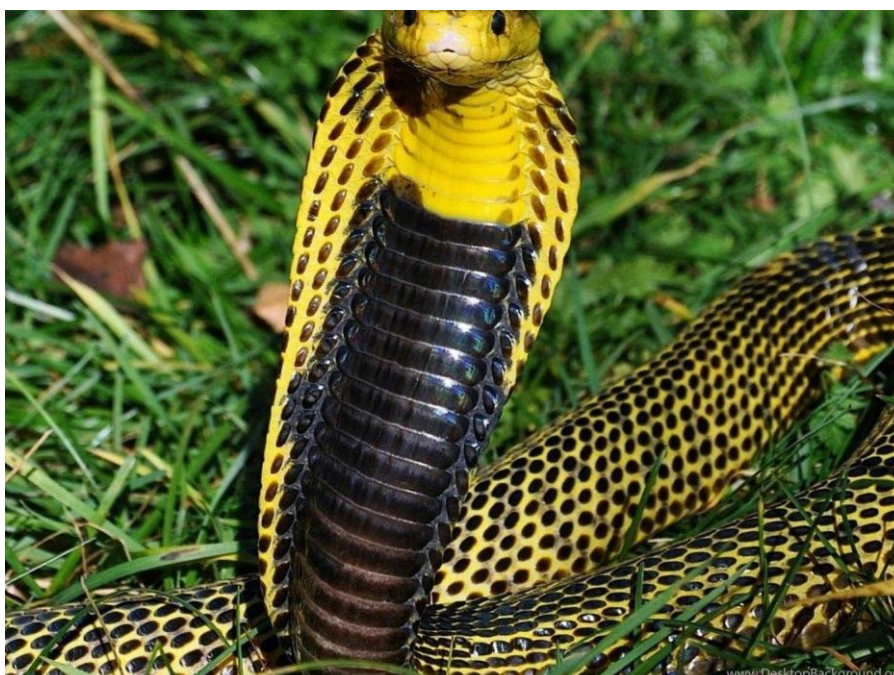


Image: King Cobra.

3. Saw scale Viper (*Echis carinatus*)

Belongs to family Viperidae. Subfamily Viperinae . Native to Africa , Pakistan ,Sri Lanka ,India Middle East ,North Equator.

Venom is toxic ,Cytotoxin ,hemotoxin ,cardiotoxin ,Neurotoxin. Venom can cause coagulopathy and Defibrination.

4. Sochurek 's saw scaled viper (*Echis carinatus sochureki*)

Echis carinatus sochureki is poisonous viper .native UAE , Oman , Iran Gulf ,Khuzestan ,Arabia ,Iran ,India ,Pakistan ,Afganistan .

This is oviparous snake.



Image : *Echis carinatus* .

5. Russells viper (*Daboia russelii*)

It is poisonous snake of family Viperidae .

Native to India. Kingdom : Animalia ,Phylum : Chordata ,Class : Reptilia ,Order : Squamata , Suborder : Serpentes , Family : Viperidae ,Genus : *Daboia* , Species : *D. russelii*.



Image : *Daboia Erusselii*

6. Malabar Pit Viper (*Trimeresurus malabaricus*)

Belongs to family viperadae . least concern , Native south west India and west India. Venomous ,Venom cause pain and swelling.



Image : Malabar pit viper.

7. Bamboo pit viper (*Trimeresurus gramineus*).

These are poisonous ,found in East and South India.

Green color. Sometimes yellowish ,brownish ,grayish in color.

Inhabit bamboo grove, Near streams , dry scrub areas. Nocturnal , carnivorous ,feed on lizards , frogs ,birds , rodents .

Ovoviviparous (Eggs are incubated in mothers body , and they give birth to young snakes (snakelets).

Least concern ,but loss of habitat due tourism ,degradation and mining.



8. *Hump-nosed pit viper* (*Hypnale hypnale*).(Merrem 's hump nosed viper).

Poisonous pit viper native to Sri Lanka and India. Belongs to Kingdom : Animalia ,Phylum :

Chordata ,

Class : Reptilia , Order : Squamata ,

Family : Viperidae ,Genus : Hypnale , Species : hypnale .

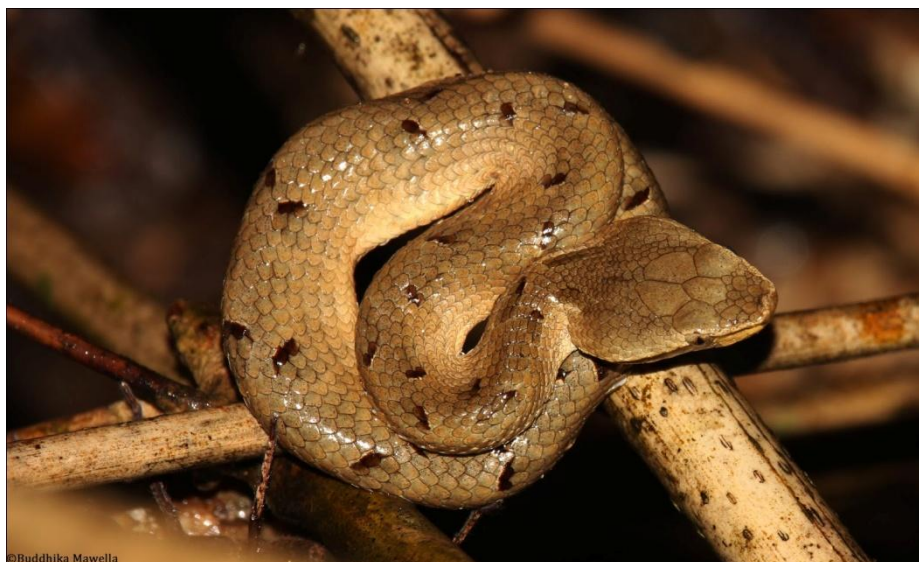
Length 45 cm , wide head and stout body Color is grayish brown. It is found in Sri Lanka ,Karnataka , India ,Western Ghats ,
Castle Rock Karnataka.

Is found in coffee plants , hill stations ,dense jungle.

Caused highest snake bites in Srilanka.

Venom cause ARF (Acute Renal Failure).

Cause coagulopathy .



9. Green tree viper (*Trimeresurus gramineus*).

Found in hills , south India & Central India. 76 cm. bright green color.

Prehensile tail , golden eyes , diet frogs & lizard .



10.Keel back snake (Checkered Keelback) ,(Fowlea piscator).

Common name Asiatic water snake , Family :Colubridae ,Subfamily Natricinae , found in Asia and are nonpoisonous.

Rostral scale visible from above.

Mimics cobra.

Self amputation or autotomy is visible. And are able to regenerate lost part.

Eat water frogs and water fishes.

Oviparous lay 70-80 eggs.

Found from Afganistan to Australia.



11. Bronzeback snake (*Dendrelaphis punctulatus*)

Present in Pakistan ,China , Indonesia ,India.also kn as tree snake.

Nonpoisonous and harmless.

2 feet (.63 m), color red ,brown , bronz , olive green . underside is pale green , red tongue ,big eyes, ventral is pale green or yellowish ,

Prehensile tail .

Eat small rodents , bat ,bird , frog , lizard .



13. Krait (*Bungarus caeruleus*)

Kingdom Animalia ,Phylum Chordata ,Class Reptilia ,Order Squamata ,Suborder Serpentes ,Elapid snake , belongs to family : Elapidae ,

Genus Bungarus , Species caeruleus . L- .9 m

Male is large and long than female.

No loreals .

India ,sindh and west Bengal.

Rest in rat holes ,brick holes,mound of termite.

Found near water sources.

Loose soil ,rodent hole ,beneath debris , feed on small mammals ,rodents ,lizards , frogs . small snakes ,blind snakes.

,poisonous ,neurotoxic . presynaptic and postsynaptic neurotoxins.

Nocturnal ,cause respiratory failure and suffocation and death.



14. Sind krait (*Bungarus sindanus*)

Found Iran , Bangladesh ,Pakistan ,Nepal , India, West Bengal,Jalpaiguri ,Midnapur , ,bihar , UP , Maharashtra , Rajasthan , Gujarat .

Belongs to family Elapidae .

Responsible for 40% snake bites of Bangladesh.



15. Sand Boa (*Eryx johnii*)

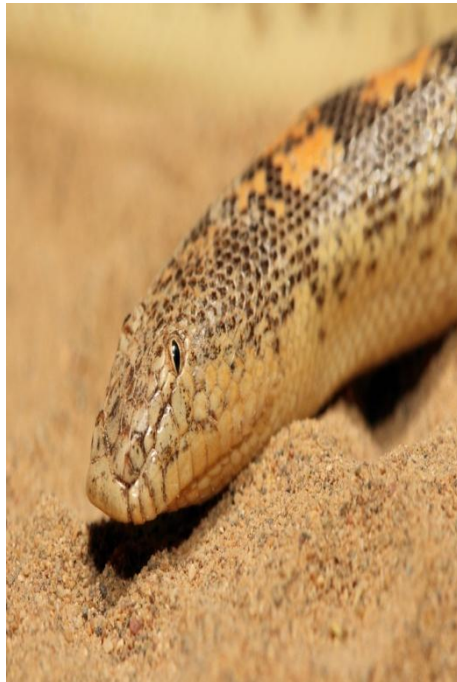
Belongs to family Boidae .Native to India ,America ,Asia ,Eurasia ,Africa .

Thick body ,burrow in sand.Head small ,round and pointed sometimes head and tail are similar.

Head helps burrowing.

One way ticket for this mouse
Juvenile Javelin Sand Boa
nd Boa

Kenyan Sand Boa
One way ticket for this mouse



16. Boa (*Eryx conicus*)
Rough scale sand boa , Rough tailed sand boa Also known as Russells Boa , belongs to Family Boidae ,subfamily Erycinae . Native to South Asia .It is nonpoisonous snake.



17. Rock Python (*Python molurus*)
Python is native to tropical ,Sub tropical forests.Indian Python ,Rock python ,Asian python ,Black tailed python .
3 m ,One of the largest snake ,Light brown color. It is nonpoisonous snake.



Belongs to family Pythonidae .

18. Rat Snake (*Python mucosa*)

Belongs to family Colubridae . also kn as darash , dhaman , Indian Rat snake , Oriental Rat snake , *Ptyas mucosa* .

2m -3.7 m long , 950-990 gms weight .Brown colour. Arboreal ,diurnal , nonpoisonous or nonvenomous , fast moving , eat rats.



19. Cat Snake (*Boiga trigonata*)

Belongs to family Colubridae.

Mild Venomous snakes ,also known as cat eyed snakes , found in South Asia ,Australia ,India.



20. *Boiga forsteni*

Belongs to family Colubridae ,

Forsten cat snake native to South Asia . mild poisonous snake .



21. Tree snake (*Dendrelapphis tristis*)

Belongs to family Colubridae . Also known as Daudins bronzeback , common bronzeback ,tree snake , present in Haryana ,Kashmir ,Jammu ,Tripura , Punjab ,Gujarat , Lonavla , Ghoshalkhamb , Maharashtra ,Madhya Pradesh ,Kerala , Tamil Nadu , India ,Srilanka , Bhutan ,Myanmar ,Nepal ,Rawalpindi ,Mandi Bahauddin ,Lodhran ,Dera Ghazi Khan ,Sialkot , Pakistan ,Punjab , Islamabad, Himalayan foothills ,South India. Camouflaged between leaves.

It is long ,Slender , bronze colored . quick ,Oviparous , lay 7 eggs which hatch in 6 weeks.



22. Green vine snake (*Ahaetulla nasuta*)

Green vine snake belongs to Colubridae family.

It is present in Bushes ,Trees ,Shrubs ,Low forests , near ponds ,Streams ,Human settlements.

Western ghats , South India , Sri Lanka , Also known as long nosed whip snake , Vine snake , eye plucker, Pachai Paambu ,Hasiru Haavu .

Eats Lizards , Amphibians . Arboreal ,Diurnal , Mild poisonous , viviparous .

Scales in 15 rows. Snout pointed , Ventral 188 , subcaudal 166, Temporals 1+2. Yellow line on both side of ventral surface.

Length 5 feet. Mild venom cause numbness ,pain ,bruising , swelling.



Scales in 15 rows. Snout pointed , Ventral 188 , subcaudal 166, Temporals 1+2. Yellow line on both side of ventral surface.

Length 5 feet. Mild venom cause numbness ,pain ,bruising , swelling.

23. Wolf Snake Barred (*Lycodon striatus*)

It belongs to Colubridae . Also known as Wolf snake , North Wolf snake , barred wolf snake , Found in Uzbekistan ,Turkmenistan ,Kopet Dagh , Tajikistan ,Sri Lanka ,Nepal ,Iran ,India ,Vishaka Patnam ,Hyderabad .

Nocturnal ,Prefers forest edge ,Semidesert , Eat lizard ,Skink ,Gekos ,Amphibians . Female lays 4 eggs , egg size 30 mm ,parental care is there.

Brown above ,white transverse spots ,crossbands , L - 44 cm ,8 cm tail , Head distinct ,snout flat , upper labials 8.



24. *Egg Eater (Elachistodon westermanni)*

Belongs to Family Colubridae .

Also known as Egg eater ,Westermann snake ,Egg eating snake , found in India ,Genus is monotypic Elachistodon .

Found in Karnataka ,Telangana ,Madhya Pradesh ,Punjab ,Gujarat ,Maharashtra ,Nepal ,Bangladesh ,India . prefer forest and shrublands ,

Also present on hights .

Dark Brown colour ,off white stripes ,head brown with black arrow. Adult L 78 cm , tail 11 cm.

Diurnal , Oviparous , form S shape coil. Dexterity in scaling vegetation. Feeds on birds eggs.

Projections on cervical vertebrae help breaking eggs.



25. Keelback (*Fowlea piscator*)

Belongs to family Colubridae, subfamily Natricinae.

Also known as checkered keelback, Fowlea piscator, Asiatic water snake.

Non poisonous, Native to Asia, Indonesia, Sumatra, Celebes, Borneo, Java, Australia, Taiwan, Yunnan, Guangxi, Hainan, Fujian, Jiangxi, Guangdong, Zhenjiang, China, West Malaysia, Vietnam, Cambodia, Laos, Thailand, Nepal, Myanmar, India, Srilanka, Pakistan, Bangladesh, Afganistan.

Eye small, Frontal scale long, Rostral scale visible. loreal long & deep, dorsal scales 19 rows keeled, ventrals 158, subcaudal 90. Crossbands with white spots. Black streaks. L 1.75m.

Lives near fresh water. Autotomy present.

Eats frogs and small fish. oviparous, lays 100 eggs, parental care. Mimic cobra.



26. *Lycodon quilicus*

Belongs to family Colubridae.

Also known as wolf snake. Lycodon snake, fang-like mandibular & maxillary teeth. Non poisonous but resemble krait.

More than 75 sp.



27. Kukri (*Oligodon arnensis*)

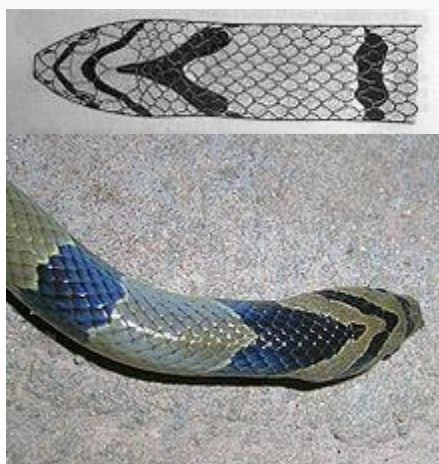
Belongs to Colubridae. Also known as Arani kukri snake, South banded snake or banded kukri snake.

Found In Sri Lanka, Nepal, India Himalayas, Afghanistan, Karnataka, Maharashtra, Rajasthan, Himachal Pradesh, Kerala, Goa, Chattisgarh, Uttaranchal, West Bengal, Orissa, Uttar Pradesh, Delhi, Goa.

Zoological name is *Oligodon arnensis*. Preocular, 2 postocular, Temporals 1+2, Scales 17 rows, ventrals angulated number 202. Subcaudals 59.

Nocturnal feeds on Earthworms, and larvae.

Nasal scale divided. Total Length 25 inches. 4 inch tail.





28. Russels kukri (*Oligodon taeniolotus*)



29. Keelback (*Amphiesma stolata*)

Belongs to family Colubridae ,Subfamily Natricinae .

Resemble Garter snake . Also kn as Buff striped or keelback . Its Zoological name is *Amphiesma stolatum* .

Non poisonous snake. Resembles water snake and grass snake.

Present in Asia ,eat frogs ,tadpoles insects and toads , olive brown colour . Body is short . Yellow stripes along sides.

□

Black crossbars on body. Keeled scales on dorsal body. Diurnal ,Hibernates and aestivates.
L-50 cm.

Found Bhutan ,Jiangxi ,Fujian ,Hong Kong ,Hainan ,China ,Taiwan ,Borneo ,Sabah ,Indonesia ,Vietnam ,Cambodia , Laos ,Thailand ,Myanmar ,Nepal ,Bangladesh , Andaman Islands ,Sri Lanka ,India(3000 feet altitude) ,Pakistan ,Sindh ,South East Asia.



Rescued egg clutch



30. *Laudankia* vine snake (*Ahaetulla* *laudankia*)

Belongs to family Colubridae . Also known as *Laudankia* snake ,vine snake. Found in Rajasthan ,Eastern Ghats and central India.



31. Awl headed (*Lytorhynchus paradoxus*)

Belongs to Family Colubridae .

Also Known as sind snake ,sind longnose sand snake .Sind awl headed snake. Present in Pakistan ,India & Nepal.

Dorsal scales 19 rows ,Ventral 175, subcaudals 53. Body cream color. L 360 mm ,tail 2.4 inches.



32. **Gunthers Racer (*Platyceps gracilis*)**

It belongs to family colubridae. It is also kn as racer or graceful racer ,slender snake . Native to India.

Obtuse snout ,Rostral deep , Temporals 2+2. Scales 21 rows , Ventrals 228 , subcaudals 121. Yellow above . Total length 33 inches.

Distribution Rajasthan ,Maharashtra ,Madhya Pradesh ,Gujarat.



33. **Sand snake (*Psammophis schokari*)**

Psammophis belongs to Psammophiidae .

It is found in dry country zones , Odisha (Ganjam) , India ,Nepal ,Pakistan,Bangladesh ,Cambodia ,Tripura ,West Bengal , Uttar Pradesh ,Uttarakhand ,Rajasthan ,Telangana Punjab ,Maharashtra ,Madhya Pradesh ,Karnataka ,Jharkhand ,Haryana ,Gujarat ,Chhattisgarh ,Andhra Pradesh ,Bihar ,VietNam ,Thailand , Laos ,Myanmar .It is found in Terrestrial areas ,Fast moving , diurnal .

Rostrals deep ,Temporals 1+2 or 1+3.

Scales Subcaudals 90 , ventrals 182 , 17 rows. Dorsal Olive brown colour, Ventral yellowish . Length 0.92 m .



34. *Trinket V collard (Coelognathus helena nigriangularis)*

Belongs to family Colubridae . Found in central asia ,Bangladesh , Nepal , Sri Lanka ,Pakistan , India,Vishakhapatnam (Daudin ,1803) .

Rostral is broader ,Loreal is longer ,Large preocular & 2 postoculars are present . Temporals are 2+2 or 2+3. 27 rows dorsal scales

Midbody ,smooth & keeled. Ventrals 265. Subcaudals 94 ,Anal plate entire .

Lives near termite mounds , dense vegetation , old vegetation , old trees , wood logs , fields. Feed on Lizards ,Smalls and Rodents.

Bites dangerous ,Males more aggressive.

□



35. *Royal Snake (Spalerosophis arenarius)*

Belongs to family Colubridae, subfamily Colubrinae. .

Also known as red spotted Royal snake . Red spotted diadem snake.

Present in South Asia ,Sindh ,Karachi ,Pakistan ,India , Rajasthan .

L-1m ,Dorsal off white colour , pale , dark spots , arranged quincuncially. Dark stripe on side of neck . ventral white.

Oviparous ,May to july egg laying . female lays 7-10 eggs.

□



36. Water snake (Siebolds) (*Ferania sieboldi*)

Belongs to family Homalopsidae . Also kn as Siebolds snake ,mud snake ,smooth water snake , mild poisonous.

Native to Asia. North India ,Central India ,Malaysia ,

Dorsal Large blotch pattern similar to Python .Found in wetlands. Length 80 -100 cm. It is viviparous snake.



Contents



37. **Brahmini snake (*Indotyphlops braminus*)**

Belongs to typhlopidae .

Also known as blind snake ,brahminy blind snake ,fossorial ,like earthworm , parthenogenetic.

31. **Worm snake beaked (*Grypotyphlops acutus*)**

Belongs to family Typhlopidae.present in South India. Blind snake ,beak nose worm snake ,beak blind snake , beak worm snake .

Nonpoisonous snake. Sister group of African Typhlopids.



38. **Racer(*Glossy Bellied*)(*Platyceps ventromaculatus*)**

Belongs to Family Colubridae .

Also known as Hardwicke s rat snake ,spotted bellied snake ,gray rat snake ,glossy bellied racer.

Lives in Asia ,

Found in Maharashtra ,Khandesh ,Uttarakhand ,Kumaon ,Almora ,Chitral ,S. Asia .

Israel ,Saudi Arabia ,Bahrain ,Kuwait , Jordan ,Iraq ,Iran ,Uzbekistan ,Afghanistan ,Turkey ,Pakistan ,India. Long round smooth graceful snake. Brown green dorsal and light color ventral surface. 128 cm long.



39. Sand snake (Leiths) (Psammophis leithii).

Belongs to family Psammophiidae , also kn as sand snake ,ribbon snake , Leith s snake , sand racer. Lives in S. Asia .

Present in Gujrat ,P[akistan ,Rajasthan ,Maharashtra ,Madhya Pradesh ,Jammu Kashmir ,Utter Pradesh , India , East Afganistan .

Rostral is broad.

Dorsal scales 17 & Ventral 188.

Siubcaudal 138.

Grey yellow above & white below. Spotted. Length 99 cm.

Mild poisonous .poison is not harmful.



40. Dumerils Black headed (Sibynophis subpunctatus)

Present in Sri Lanka , south & Northeast India , central India ,East Ghat , West Ghat ,Bangladesh .

Belongs to Family Colubridae .Diurnal as well as nocturnal .lives in leaf litter ,eats small snake ,skink ,geckos ,Arthropods .

Size 19 inches.

Rostral scale broad. 17 dorsal & 220 ventral scales.



Dorsal color Brown & ventral color yellow.

41. *Racer (Banded), Platyceps plinii*).

Found in Bangladesh ,Nepal ,Pakistan ,Srilanka ,North Bengal , Kashmir ,India & TamilNadu.

Belongs to family Colubridae ,

Obtuse snout , brownish ,Olive above and light color below. Length 1060mm ,tail 8.5 inches.



42. *Rinkhals (Hemachatus haemachatus)*

Hemachatus haemachatus is Asian spitting cobra .also kn as ring necked spitting cobra. Belongs to family Elapidae . it is present in S. India. Dark belly and light crossbands on throat.

Length 110 cm., scales keel like ridged.

Eat small reptile ,amphibian ,mammals ,toads.

Ovoviviparous ,give birth 40 -70 young ones. Venom cytotoxic and neurotoxic .

Live in grassland and swamp habitats. Alpha neurotoxin bind to & inhibit nAChR s (Nicotinic Acetylcholine Receptor Toxins on postsynaptic membrane.



IV. Conclusion

Snakes are seen during Summers and Rainy season ,not visible during winters .
In Desert areas Poisonous & Non poisonous snakes are found .Poisonous snakes are more common in desert & semiarid areas.

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