



Poisonous And Non- Poisonous Snakes



Objectives

- Poisonous ,Non- Poisonous snakes- example
- How to identify Poisonous ,Non- Poisonous snakes
- Study of cobra , viper, krait, rat snake, python
- Poison apparatus
- Biting mechanism
- Venom and its uses

Introduction & Scientific Classification Of Snakes

- Kingdom : Animalia
- Phylum : Chordata
- Sub Phylum : Vertebrata
- Class : Reptilia

Poisonous

- Cobra
- Krait
- Pit viper
- Rattle snake
- Russell's viper
- Coral snake
- Sea snakes

Non- Poisonous

- Python
- Rat snake
- Earth snake (sand Boa)
- Blind snake

Why do Snakes Bite People?:

- They want to be left alone
- escaped away when see people.
- They do not try to chase or bite you.
- They only bite when **they feel unsafe** from you that is disturbed.
- Non-poisonous snake's bite is not fatal.
- Poisonous snake's bite is fatal and should be cured immediately.

How to Differentiate Between Poisonous Snakes and Non Poisonous Snakes

1. Observe tail



Pointed, cylindrical tail

Land snake



Flat and laterally compressed tail

Marine snake **Poisonous**

2. Observe ventral scales



Small belly scales
non-poisonous



Narrow belly scale
non-poisonous



broad, covering the
entire width of belly
poisonous
Or
non-poisonous

3. Observe head



Small scales
pit absent
Viper



Small scale,
Loreal pit (infrared-
detecting organs)
Pit Viper



Shields on
head
poisonous
Or
**non-
poisonous**

4. Observe jaw scales



3rd supra-labial shield (upper –lip shield) touches the eye and nose shield
poisonous



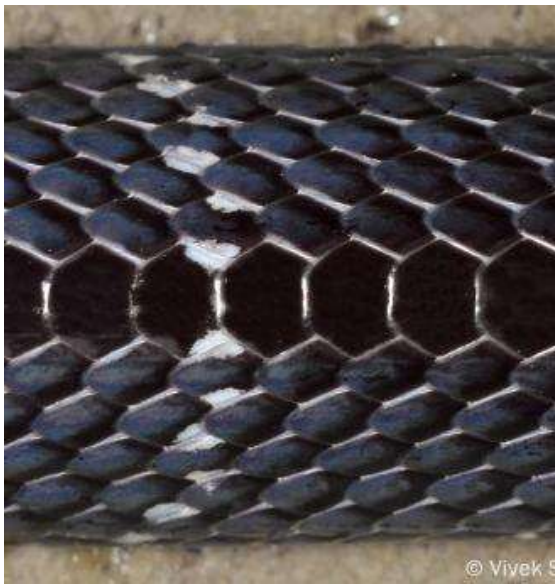
Non-poisonous snake



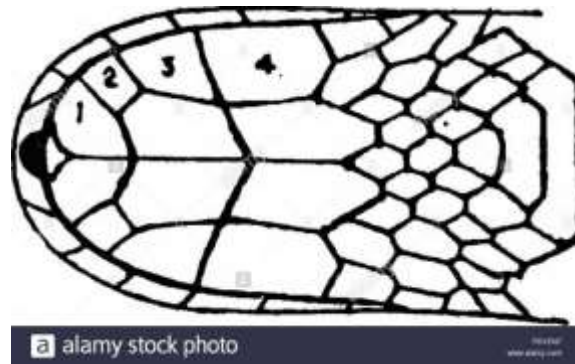
Neck with hood
cobra



Neck without hood coral spots on belly
Coral snake



Vertebrals (scales on middle of the back) are enlarged , hexagonal



Forth infra labial is largest
Krait

Summery

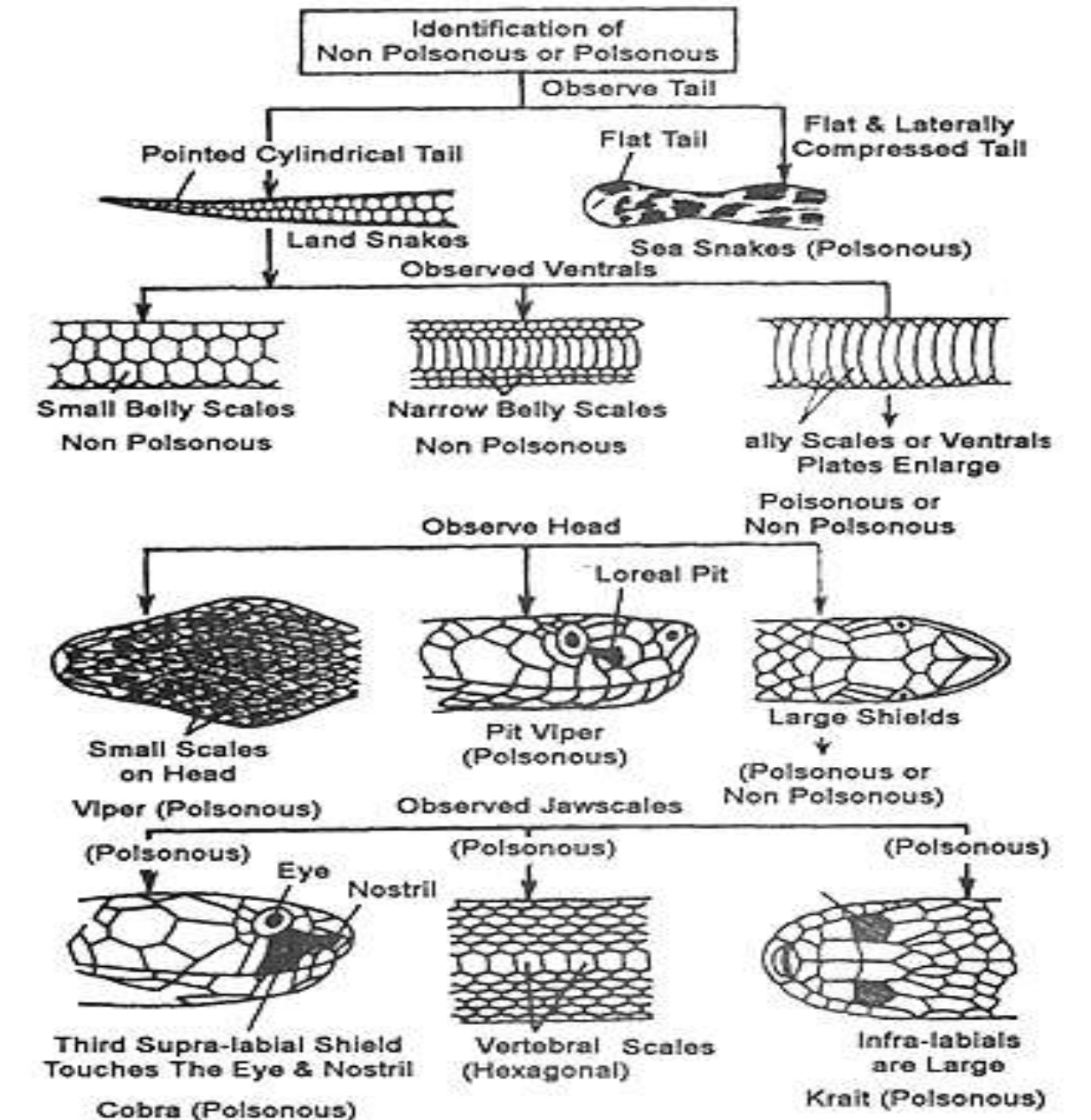


Table of Identification of Poisonous and Non Poisonous Snakes

Poisonous snakes

1.Krait

2.Cobra

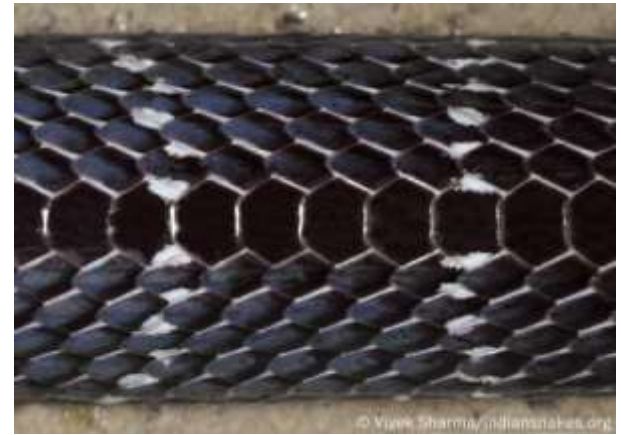
3.Viper

Krait / *Bungarus*

- Elongated ,cylindrical body
- Scales –smooth
- Head- not differentiated from body, normal shield
- Cause more death as compare to other snakes lives in crevices of wall



- Backbone – ridged, hexagonal, enlarged scales
- Ventral surface is white
- 3rd & 4th supra labials are touching the eye
- Carnivorous- rats, lizards & other snakes
- Venom – neurotoxic
- Oviparous



Cobra / *Naja naja*

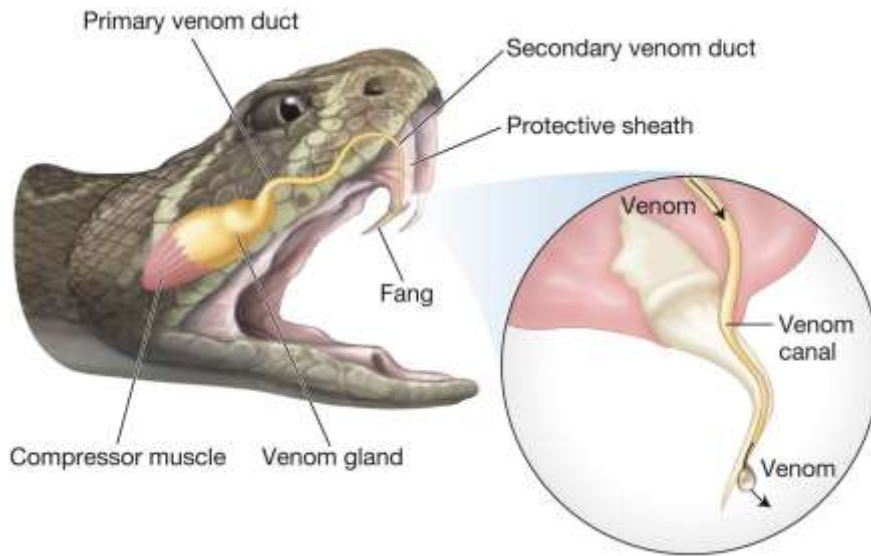
- Found in India, Africa, China, Australia, New Guinea, Egypt
- Body color- brown to blackish ~ 2 meter in length
- Diurnal, shy, lives in hole under stone, mud wall
- Feeds on lizards, frogs, rats & other snakes
- Neck is dilatatable, cervical ribs elongates
- Hood- expansion of neck and cervical ribs



- Hood-
 - i. Binocellate –mark of spectacles, mark of 10, Maharashtra
 - i. Monocellate- single mark surrounded by ellipse bengal
 - ii. Non-cellate – Rajasthan, Gujrat, M.P.
- 3rd supra labial touches eye
- Fangs are small and non movable
- Venom – neurotoxic
- World largest poisonous snake
- Quick death- respiratory paralysis
- Viviparous



- Annoyed → raised body → hood



strike object

Poison gland

Poison through ducts

Viper

- Found in India, Burma, Shri Lanka, Europe, Africa
- Found in Rock and bushy region
- Feed on mice , rat , lizards & birds
- Two types-
 - i. Pitless-Russel's viper
 - ii. Pit viper-Himalayan viper
- Colour- pale brown
- Tail short
- Nocturnal
- viviparous



- Head- large ,flat, uniform small scale
- Scales –keeled
- Sensor pit between eye and nostril (loreal) in Pit viper
- Long movable fangs
- Remained coiled – when disturbed- body swells , - strike – thrust fangs – inject venom



Non- Poisonous snakes

- 1. Rat snake or Dhaman**
- 2. Python**

Rat snakes/ Dhaman /*Zamenis*

- Found in India, Pakistan, Sri Lanka & Afganistan
- Body-Elongated, greenish or greenish brown, ventrally pale yellow
- Eyes- large, rounded pupil
- Trunk – smooth scale , pattern of cross bar
- Sharp ridges along backbone



- Tail- long, 2 rows of scale ventrally
- Active, aggressive, untameable, often attack on face
- Feeds on rats & snake- Friends of farmer
- Viviparous
- Climb trees forcibly attack like whip- so called rope snake, run swims fast
- Bites viciously and coil around victim firmly
- Emits foul odour

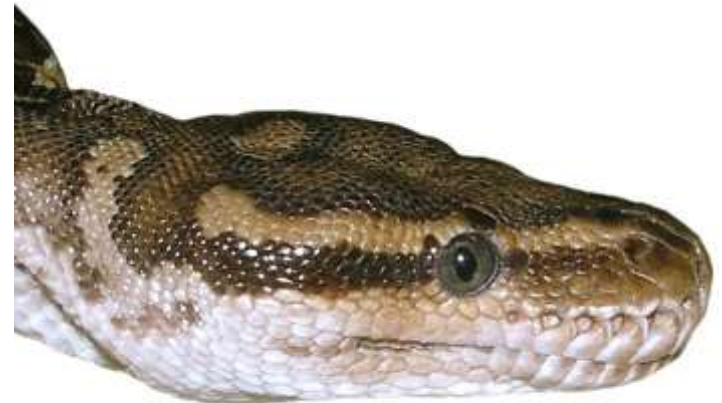


Python/ Ajar

- Found in India, Indo- China area
- Body – large, 8-10 meter weight- max 125 Kg
- Brown colour, rhomboid dark- grey edged spots
- Carnivore- reptiles, birds, mammals
- Oviparous



- Ventral- greenish with yellow brown spot
- Head- distinct from neck, small scale
- Rudiment appendages – claw spurs



Poison apparatus

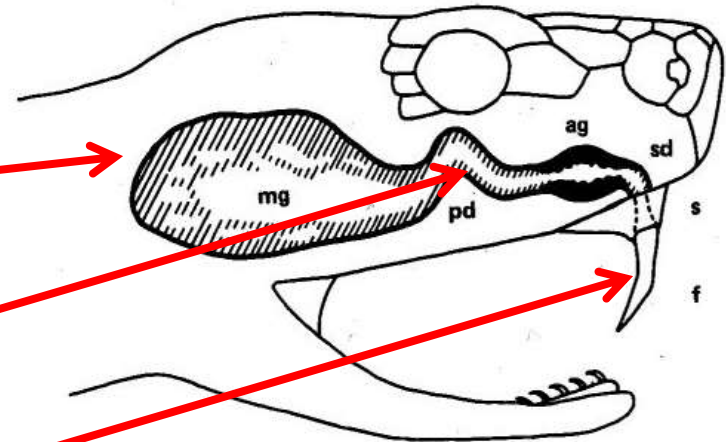
- Location- on roof of anterior part of upper jaw

a) Pair of poison gland

b) Poison ducts

c) Pair of fangs

d) muscles



a) Poison gland-

- two sac like gland either side of upper jaw
- Modified paratoid gland
- Encapsulated with fibrous connective tissue
- Covered with constrictor muscle- fan shaped, also called temporal- squeezing poison

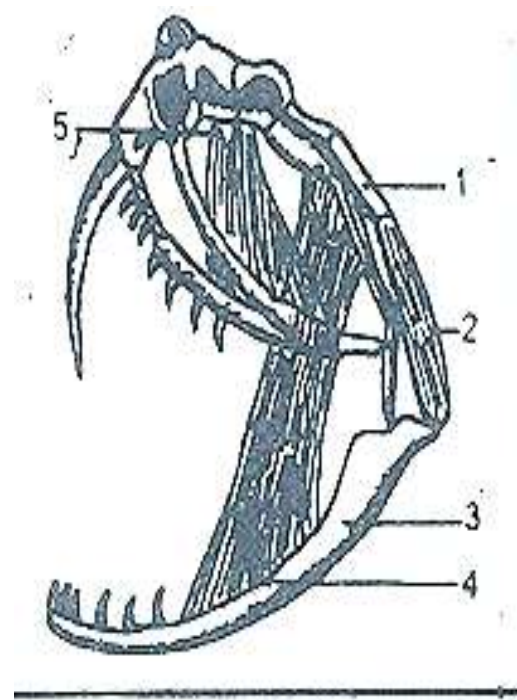
a) Poison duct- from gland to fang

c. Fangs

- Sharply pointed specialized teeth
- Attached to maxillary bones
- Enlarged maxillary teeth
- Long, curved sharp, pointed
- Acts as hypodermic needle

Muscles

- i. Diagastric- skull to lower jaw
- ii. Protector muscles
- iii. Anterior and posterior temporalis muscles-



Muscles associated
with poisonous apparatus
of a snake

- 1) Squamosal
- 2) Digastric
- 3) Mandible
- 4) Anterior temporalis
- 5) Sphenopterygoid Muscle

Venom

- Secretion from poison gland
- Stored in gland
- Evolved for capturing prey ,killing and digestion
- Clear sticky faint yellow to greenish color
- Tasteless, odorless, acidic
- Complex mixture of enzyme and toxins
- Can be dried and stored
- Dissolve in water , glycerin, salt solution



Commercial uses of venom

1. Excessive bleeding blood-clotting protein
2. Stroke Components :breaking blood clots
3. Neurological diseases :Parkinson's disease and Alzheimer's disease.
4. Cancer :treatment for breast cancer.
5. Aging: yes, some are even used in a commercial wrinkle cream!

Enzymes present in venom

1. **Protease:** endopeptidases (trypsin), killing of cells, proteolytic. Ceases heart beat. Blood clotting
2. **Phospholipase** :enzyme that transforms the phospholipid molecule into a lysophospholipid ,ruptures cell membranes.
3. **Cholinesterase** :hydrolysis of these cholinergic neurotransmitters,
4. **Hyaluronidase** : prevents entry of liquid in the cell.
5. **Nuclease** : degrades DNA/RNA