Biting and feeding mechanism of Snakes

Introduction: The Snakes are well known to human civilization since living immemorial. They are worshiped in all most all corners of globe because they are regarded as an agent of life and death. In our country more than 24000 people suffer their valuable life due to snake biting and naturally this makes people eager to know regarding the nature of poison and the mechanism of snake biting.

It is true that snakes are universally disliked among because bite of poisonous snake is sometimes fatal but most of them are harmless.

Snakes are limbless reptiles and most of them are burrows and ideally adapted for their mode of life. Cylindrical body without limbs suits for living in holes.

Family	Example
Colubridae –	King Cobra, cobra, krait etc.
Elapidae –	Coral Snakes.
Hydrophidae –	Sea Snake
Viperidae –	viper.

(2) Poisonous apparatus

All the poisonous snakes have in their heads a poisonous apparatus which is not found in non poisonous snakes. The following organs are associated in snakes biting.

a) a pair of poison gland
b) their ducts
c) fangs.
d) muscles

(a) Poison gland

. The poison gland is a modification of Supra labial or parotid gland. They are two sac like structure, situated one on either side (jaws) of the upper jaw, below the eyes at some what behind them. The glands may be small and oval (in sea snakes) or large & tubular (in vipers)

depending on species.

Each gland is thickly encapsulated with fibrous connective tissue and surrounded by a fan shaped constrictor muscle, often reflected temporalis or masseter. On stretching during biting squeezes poison from gland into its ducts

(b) Poison duct

A narrow poison duct leads anteriorly from each poison gland to the base of a poison fang to enter its groove or canal.

(c) Fangs

Fangs are specialized teeth attached to maxillary bone they are paired, long, curved, sharp at pointed. They act as syringe and inject poison into the victim. The fangs are regenerated when lost or destroyed. On the basis of structure and position 3 types of fangs occur in poisonous snakes

(a) Opisthoglyphous - when the fangs are situated at the posterior end of the maxillae (in fangs Colubridae particularly)

(b) Proteroglyphous - when the fangs are situated at the anterior end of the elongated maxillae (Ex - Cobra, krait, Coral Snakes)

(c) Solenoglyphous - when the maxillae are short and narrow grooves have only the poison fang with narrow grooves. Such fangs are long and when not in use they remain folded under the roof of the mouth as in viper and pit vipers.

Related bones (skeletal elements of the jaw)

The biting habit has brought about structural modification in the skull bones and jaw which together constitute the biting apparatus. The

The concerned bones are the maxilla, squamosal, quadrate, pterygoid, palatine and ectopterygoid.

Maxilla - Small and free moveable

Squamosal - Horizontal and is attached to the cranium on the one end and on the other hand to the quadrate

Quadrate - suspends the lower jaw and thus functions as fulcrum for the rotatory movement

Pterygoid - It is jointed with quadrate on the back side and front side with palatine and maxilla

Teeth may be present on the palatine, pterygoid and upper and lower jaws. Quadrate, pterygoid palatine and maxilla formed the bone system which helps in erection and opening of the jaw.

Muscles - A number of muscles associated with the biting apparatus are present. These muscles are ←

(a) Digastric muscles - these muscles are attached to the squamosal at one end at the posterior extremities of the lower jaw, on the other end.

(b) Sphenoptergoid - Muscles are attached anteriorly to the orbits - sphenoid region and posteriorly to the dorsal surface of the pterygoid.

(c) Temporalis muscles - Extends from the side walls of the cranium to the lower jaw. They help in closing the lower jaw.

(d) Masseter muscles or Mandibularis constrictor muscles - They are associated with the poison glands and press them when required

Biting Mechanism

The whole process of biting of a Snake is a complicated process and may be discussed

under the following sub-headings.

(1) Opening of the mouth

In resting condition the mouth remains closed and the fangs be curved within the mouth. But when the snake is ready to strike, the mouth opens by the contraction of digastric muscle as a result of which the lower jaw is depressed.

(2) Rotation of maxilla - As the mandible is lowered the distal end of the quadrate is thrust forward the pterygoid and ectopterygoid bone also.

The forward and upward movement of the ectopterygoid brings about the rotation of the maxilla and the fangs become erected into a vertical position.

(3) Closure of the mouth - This is brought about by the contraction of the temporalis muscle pulling up the lower jaw. As the mouth closes the fangs are inserted into the body of the prey.

(4) As the fangs are pierced the masseter muscle contracts and squeeze the poison gland forcing the poison through the fangs. The fan shaped ligaments also come into play at this time and help in squeezing the poison.

The biting apparatus is so constructed that all the action take place automatically with the raising of the lower jaw. All the related bones are brought to their normal position.

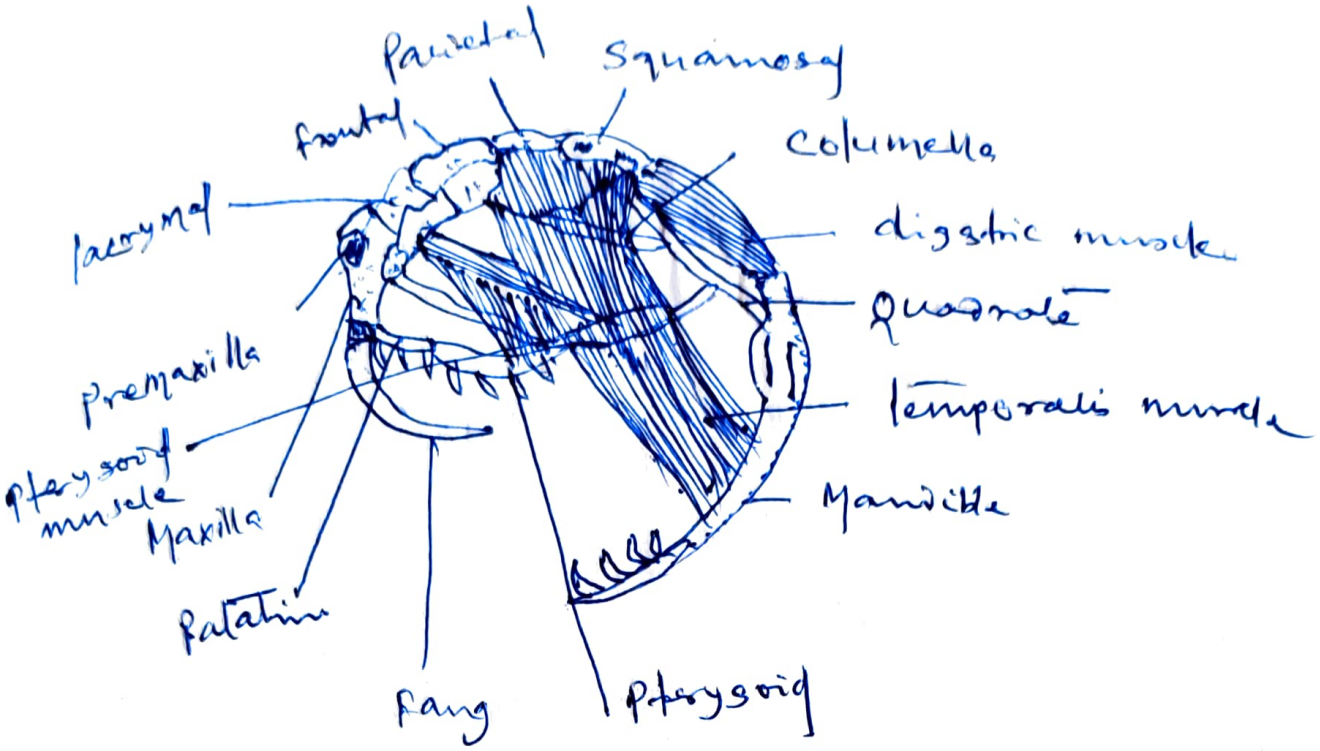

Fig :. Mechanism of Snake poisoning