

Nervous System of Pila:

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The nervous system consists of ganglia; commissures, connectives and the nerves to different organs (Fig.1).

Ganglia:

The main ganglia are:

- (a) One pair of roughly triangular cerebral ganglia situated on the dorsolateral sides of the buccal mass, one on each side of the head.
- (b) One pair of pleuropedal ganglia placed below the buccal mass on the lateral sides. Each pleuropedal ganglionic mass is formed by the fusion of pleural and pedal ganglia. The infra-intestinal ganglion is also fused with the right pleuropedal mass.
- (c) Visceral ganglion is very large and appears to be unpaired. It is a bilobed structure and is formed by the fusion of two separate ganglia. The visceral ganglion is placed posteriorly very close to the heart.
- (d) A pair of buccal ganglia are situated on the buccal mass on the two sides of the oesophagus.

(e) A single suprainestinal ganglion is located near the middle of the left pleuro- visceral connectives.

Commissures:

The nerve connections between two similar ganglia are called commissures. The ganglia are placed on the opposite sides of the body. Two cerebral ganglia are connected by a thick nerve cord called cerebral commissure. The buccal ganglia are also connected by a delicate buccal commissure. The inner sides of the pleuropedal ganglia are connected by a broad nerve called pedal commissure.

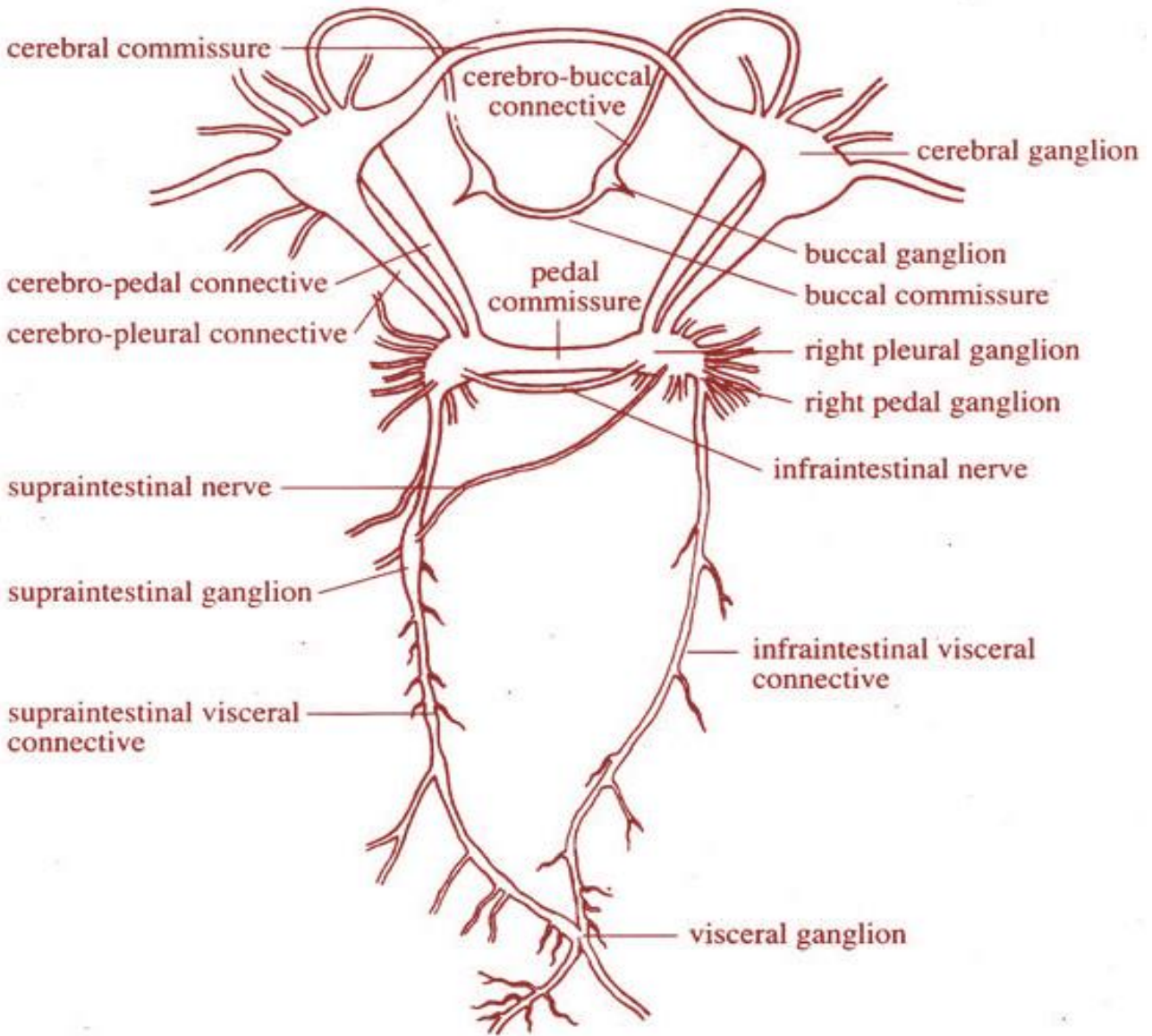


Fig:1 Nervous System of Pila

Connectives:

The nerve connections between two dissimilar ganglia are called connectives. The ganglia may be situated on the same or opposite sides of the body. The cerebral ganglia and the buccal ganglia are connected by cerebrobuccal

connectives. The pleuropedal ganglia are connected on each side with the cerebral ganglion by cerebropedal and cerebropleural connectives.

That the pleuropedal ganglia are formed by the fusion of separate pleural and pedal ganglia is indicated by the presence of an indistinct constriction and the existence of two separate connectives joining the cerebral ganglia. The pleural ganglion is connected with the visceral ganglion by a pleurovisceral connective on each side.

The right pleurovisceral connective lies below the level of the oesophagus and is generally designated as infraintestinal visceral connective and the left pleurovisceral connective is situated above the level of the oesophagus and is termed as supraintestinal visceral connective.

The supraintestinal ganglion is connected with the right pleuropedal ganglion by an oblique nerve placed above the oesophagus called supraintestinal nerve. A very slender nerve called infraintestinal nerve is present connecting the two pleural ganglia of two sides.

Nerves to the different parts of the body:

Each cerebral ganglion innervates the eye, the snout and the tentacles on its side. The statocyst is also innervated by a slender nerve arising from the cerebral ganglion. The pedal ganglion gives out numerous nerves to the foot and the pleural ganglion supplies the mantle.

The suprainestinal ganglion supplies nerves to the ctenidium and the pulmonary sac. The visceral ganglion sends nerves to kidney, genital organ, pericardium and intestine.

The buccal ganglion innervates the buccal mass:

Chiastoneury:

The nervous system of Pila exhibits streptoneurons chiastoneury condition. This is the result of torsion of visceral mass which has made the whole nervous system asymmetrical. The complexities in the nervous system in Pila are due to complete migration of the anal and genital openings in the oral end.

The chiastoneury is not so clear in Pila and typical figure of 8-like arrangement is not produced between the supra- and infra-intestinal nerves. No crossing is possible on the

right side because of the shifting and fusion of infra-intestinal ganglion with the right pleural ganglion.

The zygoneury (a secondary connection between pleural and suprainestinal ganglia) is present only on the left side. So the typical chiasmoneurous condition with double zygoneury as seen in many gastropods is not clear in Pila.

When there is torsion & the nervous system assumes a figure of 8 and infra intestinal nerve hangs like a loop, it is called **streptoneuric nervous system**. In pila nervous system is streptoneuric nervous system.

Sense Organs:

The sense organs are quite well developed.

Osphradium:

The osphradium is the organ for taste. It helps to taste the chemical and physical qualities of the incurrent water and also assists in the selection of food. There is only one osphradium which remains suspended from the roof of the pallial cavity on the left side.

It is small in size and is roughly oval in shape (Fig. 2A). Figure 2B shows the detailed structures of osphradium in sectional view. It has a bipectinate arrangement of its

leaflets on the two sides of a central axis. It consists of a single epithelial layer enclosing nervous tissue, connective tissue and blood spaces.

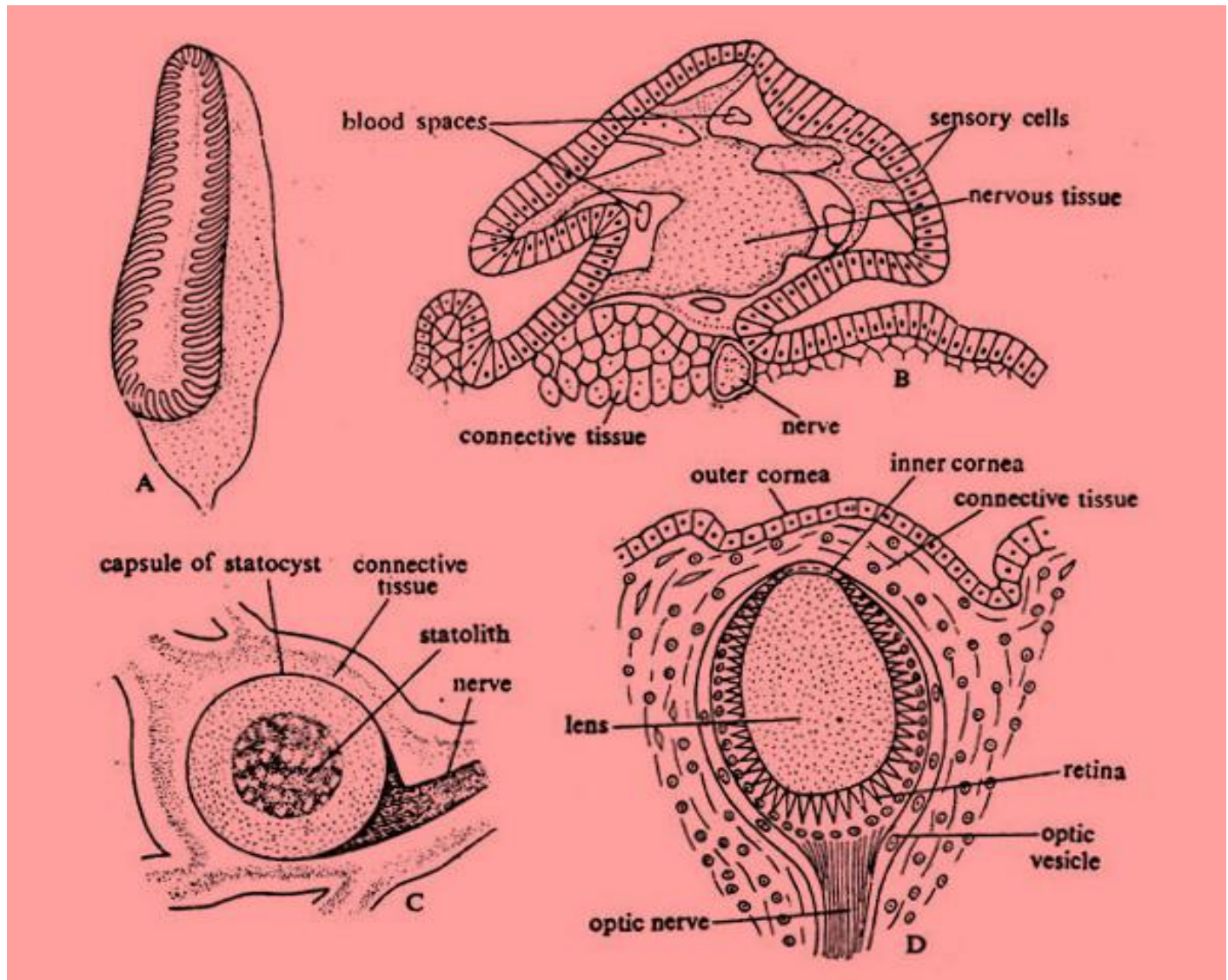


Fig.2 Sense organs in Pila A. An entire osphradium B. Sectional view of osphradium. C. A Statocyst. D. Sectional view of eye.

Tentacles:

The labial palps and the true tentacles are the tactile organs.

Statocyst:

The statocysts are two in number and are situated one on each side of the pleuropedal ganglionic mass. Each has a round sac-like body (Fig. 2C) and is kept in position by muscles. The centre of the sac is occupied by a solid mass of calcareous particles known as statolith. It is the organ of balance and gets its nerve supply from the cerebral ganglion.

Eyes:

Two eyes are located one at the base of each longer pair of tentacles. Each eye is a closed vesicle (Fig. 2D) with the inner wall lined by photosensitive or retinal cells. The opening of the vesicle is covered by transparent outer and inner corneas.

The cavity between the cornea and the retina is filled up with an oval body constituting the lens. Although, in *Pila*, the eyes have all the essential components for photoreception, it is very poor in sight.

Reference: Introduction to General Zoology; Vol:I Chaki Kundu and Sarkar.

