

### ***Nervous System of Pila Globosa:***

The nervous system of *Pila globosa* consists of paired and unpaired ganglia with their commissures and connectives. The commissures are the nerves which establish connections between similar ganglia, while connectives are the nerves which connect two dissimilar or different ganglia. However, the paired ganglia of *Pila* are cerebral, buccal, pleural, pedal and visceral, while unpaired ganglia are suprainestinal and infraintestinal.

**These ganglia with their commissures and connectives are described below:**

#### **1. Cerebral Ganglia:**

There are two triangular cerebral ganglia, one on each side above the buccal mass, they are connected to each other by a thick cerebral commissure running transversely above the buccal mass, and by a thin labial commissure lying below the buccal mass. Each cerebral ganglion is further connected with the buccal ganglion of its side through a very slender cerebro-buccal connective.

Thick band-shaped cerebro-pleural and cerebro-pedal connectives serve to connect each cerebral ganglion with the corresponding pleural and pedal ganglia. Each cerebral ganglion gives off several nerves supplying anteriorly the **skin of snout**, the **tentacle** and the **buccal mass**; and posteriorly the tentacle, the **eye** and the **statocyst**.

#### **2. Buccal Ganglia:**

At the junction of the **buccal mass and oesophagus** are two buccal ganglia. They are connected to each other by a transverse buccal commissure. They are also connected to the cerebral ganglia by a cerebro-buccal connective on each side, the connectives lie above the buccal mass. Nerves from each buccal ganglion supply the **buccal mass, radular sac, salivary glands, oesophagus and the oesophageal pouches.**

### **3. Pleuro-pedal Ganglionic Mass:**

In fact, the pleural and pedal ganglia of each side join together to form a pleuro-pedal ganglionic mass situated below the buccal mass. In a pleuro-pedal ganglionic mass, the **pleural ganglion is placed towards the outer side and the pedal ganglion to the inner side.** The pleuro-pedal ganglionic mass is connected to the cerebral ganglion of its side by a cerebro-pleural connective and cerebro-pedal connective.

The two pedal ganglia are connected to each other by two pedal commissures lying closely parallel to each other. The **right pleuro-pedal mass has an infra-intestinal or a sub-intestinal ganglion also fused with it. A slender, loop-like infra-intestinal nerve behind the pedal commissure, connects the pleural ganglia of both the sides. A statocyst is connected by a band of connective tissue, to each pedal ganglion.**

### **4. Supra-intestinal Ganglion:**

The supra-intestinal ganglion is a slightly swollen, more or less fusiform ganglion lying in a sinus about a quarter of an inch behind the pleuro-pedal mass of the left side.

It is connected with the pleuro-pedal mass by a stout connective, called zygoneury. It gives off on the inner side a thin supra-intestinal nerve which runs anteriorly above the intestine to the right side to join the right pleural ganglion. The supra-intestinal ganglion also sends off posteriorly a branch, the left visceral connective which connects it with the visceral ganglion.

### **5. Visceral Ganglion:**

The visceral ganglion is formed by the fusion of two spindle-shaped ganglionic masses.

It lies near the base of the visceral mass close to the **anterior lobe of the digestive gland and to the right of the pericardium**. The visceral ganglion is connected with the supra-intestinal ganglion by a stout supra-intestinal or left visceral connective. It is **further connected with the fused right pleural and infra-intestinal ganglion through the infra-intestinal or the right visceral connective**.

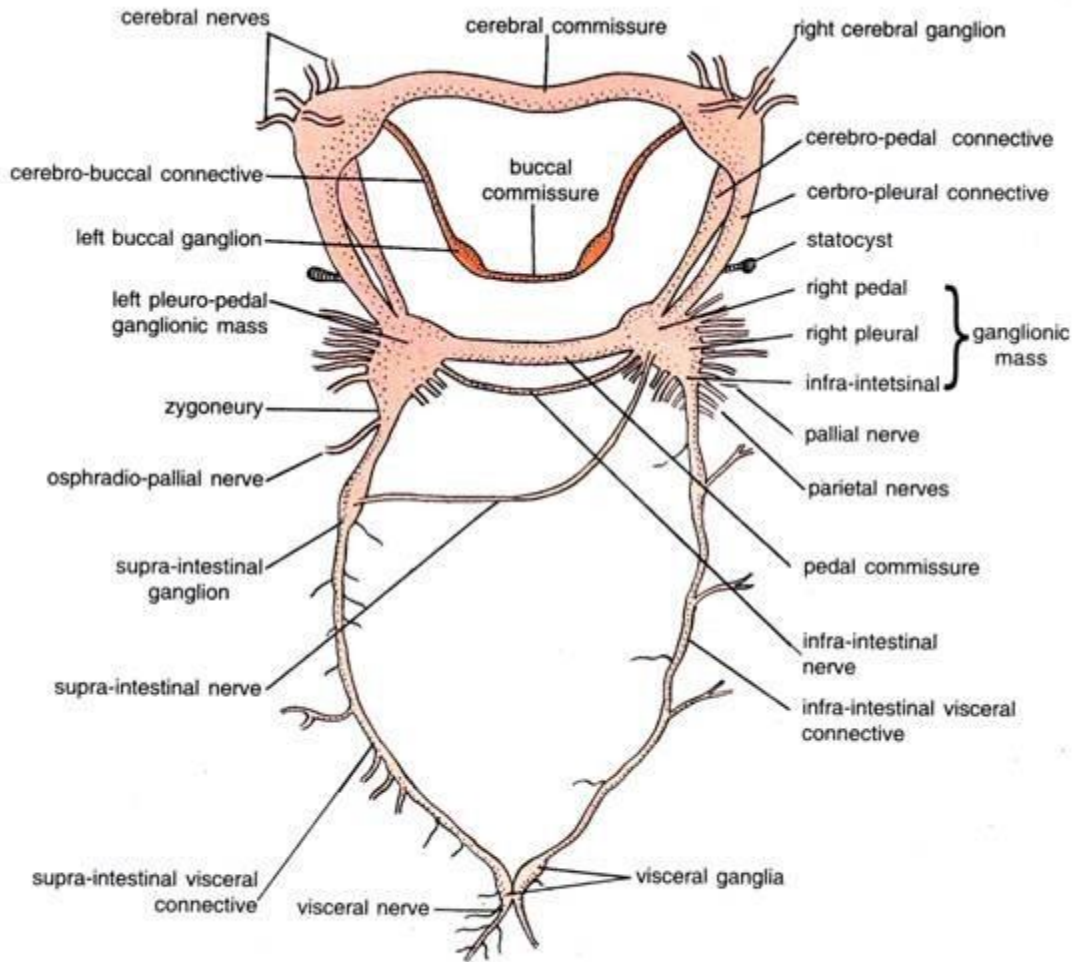


Fig. 60.23. *Pila globosa*. Nervous system.

Nerves from the cerebral ganglia go to the head, tentacles and eyes. The buccal ganglia send nerves to the buccal mass. Nerves from the pedal ganglia innervate the foot, and those from the pleural ganglia go to the mantle, ctenidium and siphons. From the visceral ganglion nerves go to the intestine, kidney and gonads. These nerves constitute the peripheral nerves.

### Characteristics of Nervous System:

The nervous system of *Pila globosa* shows two characteristics, firstly most of the ganglia, except the visceral, are

concentrated near the buccal mass, secondly the visceral loop is twisted into a figure of 8 due to torsion. The twisted condition of the nervous system is a primitive feature, because in most gastropods there is a secondary bilateral symmetry shown by the ganglia and connectives

### **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 suprainintestinal ganglia) is present only on the left side. So the typical chiastoneurous condition with double zygoneury as seen in many gastropods is not clear in Pila