

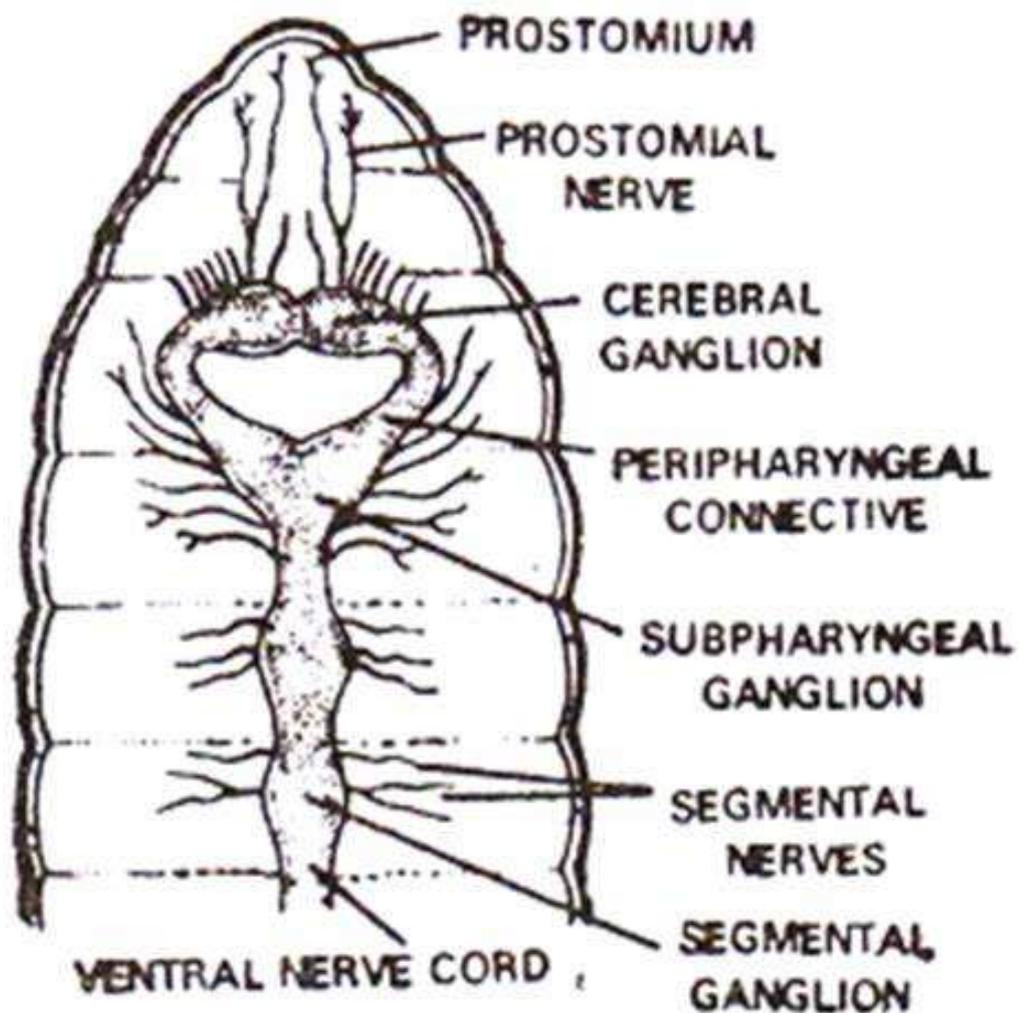
# Diagrammatic representation of nervous system of Earthworm

B.Sc. Part-I, Practical

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The nervous system of earthworm consists of three parts namely,

- I. Central nervous system
- II. Peripheral nervous system
- III. Sympathetic nervous system



# I. Central Nervous System

It includes following structures:

- i. Nerve ring
- ii. Ventral nerve cord

## i. Nerve ring

It is ring like spherical structure which lies around the pharynx in 3<sup>rd</sup> and 4<sup>th</sup> segment.

**It has 3 parts: -**

- **Cerebral ganglia-** There are two pear shaped cerebral ganglia fused together at 3<sup>rd</sup> segment called brain. They are bilobed in structure. A pair of whitish pear-shaped supra pharyngeal ganglia fused to form brain. Lies dorsally in the 3<sup>rd</sup> segment in the depression between the buccal cavity and the pharynx.
- **Circumpharyngeal connective-** Two circumpharyngeal connectives arise from each cerebral ganglion laterally. They encircle pharynx and fuse at 4<sup>th</sup> segment. The fused portion is called sub pharyngeal ganglia. It is outer bulging part which extends from 3<sup>rd</sup> to 4<sup>th</sup> segment.
- **Sub-pharyngeal ganglia-** Found in lower region of nerve ring which lies in 4<sup>th</sup> segment.

**Ventrally Circum-pharyngeal ganglia meet with a pair of sub-pharyngeal ganglia. Thus, a complete nerve ring is formed around the pharynx.**

## ii. Ventral nerve cord

It is white rod like structure, which starts running from sub-pharyngeal ganglia towards posterior end. In each segment, ventral nerve cord swells which is called segmental ganglia.

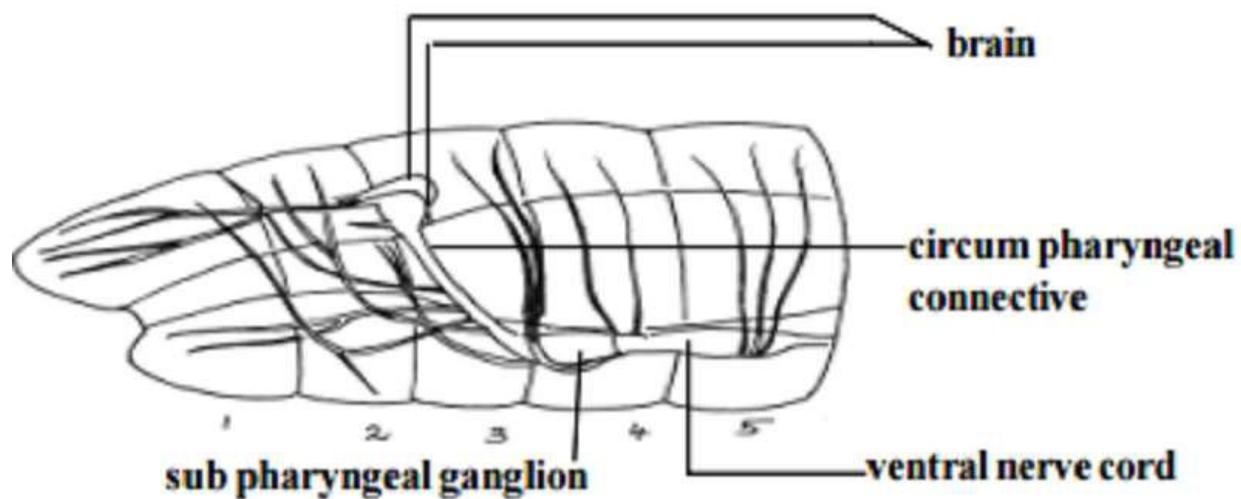
Actually, there are two cords fuse together to form single ventral nerve cord. Ventral nerve cord is composed of nerve cells and nerve fibers. There are 4 giant fibers on mid dorsal side of nerve cord which conducts impulses rapidly. The outer covering of ventral nerve cord is called peritoneum.

## **II. Peripheral nervous system**

- It includes nerve fibers or nerve, which arises from central nervous system.
- From cerebral ganglia, 8-10 nerves arise and supply to prostomium, buccal chamber, and pharynx.
- From circumpharyngeal connectives, two pairs of nerves arise and supply to 1st and 2nd segment.
- From subpharyngeal ganglia, three pairs of nerve arise and supply to 2nd, 3rd and 4th segment.
- From each segmental ganglion, three pairs of nerves arise and supply to respective segment.

## **III. Sympathetic nervous system**

It consists of nerve plexuses extensively branched and distributed beneath epidermis, alimentary canal that is connected to circumpharyngeal connectives.



**Fig. Earthworm - Nervous system**