CEPHALOPODS ARE ADVANCED MOLLUSCS

Among Mollusca, cephalopods form a highly specialized and advanced group. They possess certain characters which are similar to those of chordates. The advanced characters of cephalopods are the following

1. Morphology

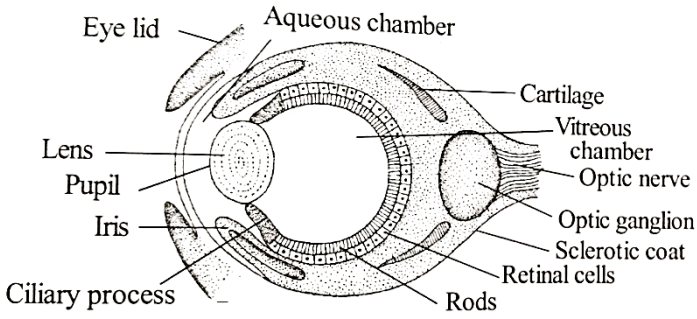
Cephalopods have the look of vertebrates. Like the vertebrates, the body is distinctly divided into three regions, namely a **head**, a **neck** and a **trunk**. (Draw Sepia Diagram)

2. Head

The head is large globular and prominent like that of vertebrates. It bears two large **eyes**, **tentacles,** a **mouth** and a **funnel.**

3. Eyes

The head bears two large eyes. They are like those of vertebrates. Like the eyes of vertebrates, their eyes possess an orbit, a sclerotic coat, a retina, the rods, a cornea, a lens, an iris, a ciliary body, the aqueous humour, the vitreous humour etc.



4. Fins

Like the fishes, cephalopods are provided with fins.

5. Colour change

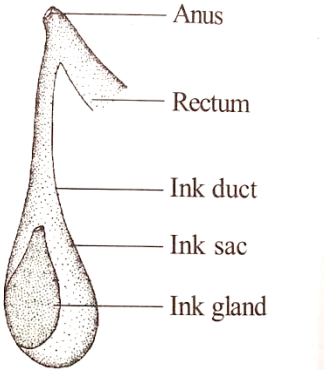
The skin of cephalopods contains **chromatophores** and **iridocytes.** The chromatophores contains colour pigments such as red, yellow and orange. The pigments can be concentrated or dispersed producing different shades of colours. The change of colour affords protection to the organism.

6. Shell

In *Sepia* and *Loligo*, the shell is internal. It forms a short of **endoskeleton** as in the case of vertebrates.

7. Digestive system

The digestive system is well developed. It is formed of a mouth, lips, jaws, a buccal cavity, an oesophagus, a stomach, an intestine, a rectum and an anus. The major types of digestive glands of vertebrates are represented here. They are the **salivary glands**, the **pancreas** and the **liver**. Cephalopods are carnivorous and voracious.



Ink sac of Sepia

8. Locomotion

Sepia and *Loligo* have the privilege to move forward as well as backward. They can swim with the help of their fins. They also exhibit jet propulsion. They eject out water through the siphon in the form of a jet and the animal is propelled. When the siphon is directed forward, the animal is propelled backward and when it is directed backward, the animal is propelled forward.

9. Ink glands

Cephalopods have an ink gland. It secretes a dark ink. When attacked by an enemy, it liberates the ink into the water producing a **smoke-screen** and the enemy is confused. When the enemy is confused, the cephalopods escape from the spot by jet propulsion.

10. Nervous system

In molluscs, the nervous system of cephalopods is well developed. They have a well developed brain. The brain is enclosed in a **cranial cartilage** which is comparable to the **cranium** of vertebrates.

The nervous system is formed of ganglia, commissures, connectives and nerves. The cephalopods have a special type of star shaped ganglia in the mantle, called **stellate ganglia.**

11. Circulatory system

Cephalopods possess a closed type of circulatory system. The arteries and veins are connected by capillaries. They have two types of hearts, namely and **arterial heart** and a **venous heart**. The venous blood and the arterial blood are kept separately.

12. Excretion

Excretion is carried out by the kidney. The excretory product is in the form of **guanine.**

13. Reproduction

The sexes are separate. They exhibit clear sexual dimorphism. The male is provided with a modified tentacle called **hectocotylized arm**.

14. Copulation

Copulation is cephalopods is a specialized type. The male has a **hectocotylized arm**. The arm is inserted into his mantle cavity. He carries **spermatophores** (bundle of sperms) in his arms. Then he deposits them in the funnel of the female safely.

15. Development

Fertilization is internal. The fertilized egg is enclosed in a **capsule**. The eggs are made into bunches and are attached to sea-weeds. The eggs hatch into young ones resembling the adults. Hence, the development is direct as in the case of vertebrates.