

# **B.Sc I Year Invertebrate Zoology Paper- I**

## **Unit -III**

### **OBELIA**

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#### **Systematic Position**

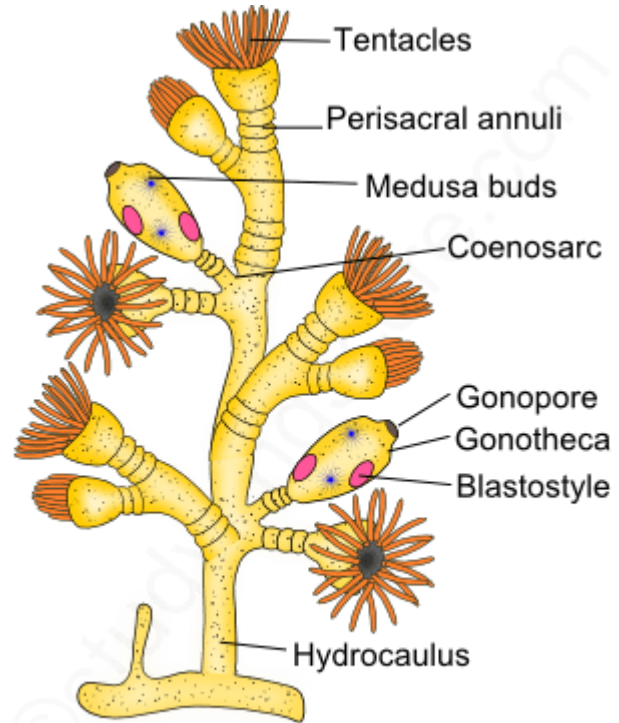
Phylum	Coelenterata
Class	Hydrozoa
Order	Hydroida
Family	Eucopidae
Genus	Obelia

#### **Habit and Habitat**

Obelia is sedentary, marine and colonial form. It is found up to the depth of 80 meters. It occurs in both asexual and sexual forms. It grows in intertidal rock pools and at the extreme low water of spring tides.

#### **External Morphology**

Obelia is also called as Sea fur. The hydroid colony of Obelia is delicate, semitransparent and whitish to light brown in color. It consists of vertical branching stems are called as hydrocauli and the root like branches are called hydrorhiza. Both are of same thickness. The growth of the colony is sympodial. Each of the vertical stem or hydrocauli branches in an alternate manner. The ultimate branch terminates in a nutritive zooid called polyp or hydranth. In the older polyps cylindrical reproductive zooids are placed which is known as blastostyle or gonangia. This Obelia colony is dimorphic exhibiting two types of zooids. When the blastostyles develop saucer-shaped bodies called as medusae, the dimorphic colony becomes trimorphic. The following are the three zooids of the Obelia colony,



OBELIA-PART OF HYDROID COLONY

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- It is a colonial hydroid.
- The colony consists of basal horizontal portion, the **hydrorhiza** which is attached with the substratum and number of vertical branches known as **hydrocauli** arising from hydrorhiza.
- The colony is **trimorphic** having three types of zooids, e.g., hydranth, blastostyle and medusa.
- Hydranth or polyp has a cylindrical body attached to the axis of the hydrocaulus by its proximal end free at its distal end.
- It is covered by cup-shaped **hydrotheca**. It is nutritive zooid of colony.
- The hypostome is surrounded by a number of solid tentacles provided with nematocytes.
- **Blastostyle** or reproductive zooid is cup-shaped without mouth and tentacles.
- It is enclosed by a covering, gonotheca.
- It gives rise to buds which later become flattened and develop into new medusae.

- Medusa is bell-shaped with a concave and convex side. It contains marginal tentacles, four radial canals, a ring canal, four gonads born on the radial canals and hanging central manubrium on the concave side.
- The medusae are free swimming.
- Life history of *Obelia* exhibit an alternation of generation, called **metagenesis**.

**Polyp or hydranth (nutritive zooids):** This nutritive zooid of the colony is also known as gastrozooids or trophozooid. It is yellow in color, radial symmetrical and cylindrical in shape. They are specialized for capture, ingestion and digestion of food. Each hydranth is closely similar in structure to that of hydra. It has a sac-like body. The basal end is not closed but connected by a hollow stalk with the hydrocaulus. The body wall composed of ectoderm, mesogloea, and endoderm encloses a simple enteron that opens to outside by the mouth situated at the free end of the hydranth. Mouth is situated at the apex of the hypostome. The ectoderm of the hydranth is thin. The nematocysts are present only on the tentacles. The middle structure less layer, the mesogloea, has nerve net present on its both sides.

The endoderm cells are similar to those of hydra. The nutritive-muscular cells possess flagella at their inner ends. The gland cells are large and with granular inclusions. The tubular perisarc surrounding the coenosarc extends around the hydranth to form its conical protective covering known as hydrotheca.

**Blastostyle (reproductive zooids):** After the hydrocaulus has reached its full development it gives rise to special zooids called blastostyles. They are fewer in number as compared to hydranths in the colony.

The mouth and tentacles are absent in these simplified zooids. They cannot feed hence their enteron is reduced in size. The distal closed end usually forms a flattened disc. The perisarc extends over the blastostyle to form a cylindrical or vase-like transparent gonotheca.

The blastostyles are the reproductive zooids as they reproduce asexually to give rise to numerous lateral buds called medusa buds or gonophores. These buds develop into third type of zooids of the colony called medusae. When they are fully formed they are set free and swim away from the colony by escaping through the ruptured distal end or by opening of the lid of the gonotheca.

**Medusae:** These are small, transparent, solitary, free swimming saucer-shaped or bell-shaped zooids. They measure about 6 mm in diameter. These are the reproductive zooids which produce the sex cells.

The inner concave side of the body is known as sub-umbrella and outer convex as exumbrella. A short, hollow, quadrangular projection, the manubrium, hangs down from the middle of the sub umbrella surface. This structure together with the disc or bell-shaped body of the medusa gives it an umbrella-like appearance. The mouth, a square or four sided opening is situated at the tip of the manubrium.

The mouth leads through the cavity of the manubrium into a small gastral cavity or enteric cavity or stomach situated in the central part of the main body of the medusa. From this cavity radiate four narrow radial canals situated at equal distances from each other. These canals run outwards toward the edge of the umbrella and open into a circular canal running around the edge of the umbrella. This system of canal enables the food to be taken in at the mouth and manubrium and digested in the stomach to be distributed through them to the entire medusa.

The edge of the medusa gives off on its inner side a very narrow, rudimentary fold or shelf called the velum. The margin of the umbrella gives off short tentacles which are sixteen in number in the newly born medusa but are numerous in the adult. Ectoderm covers both the surface of the umbrella and the outer surface of the manubrium. The endoderm lines the cavity of the manubrium, 'stomach', radial canals and circular canals which together represent the enteron. Endoderm does not extend into the velum.

To be continued in next PDF.

