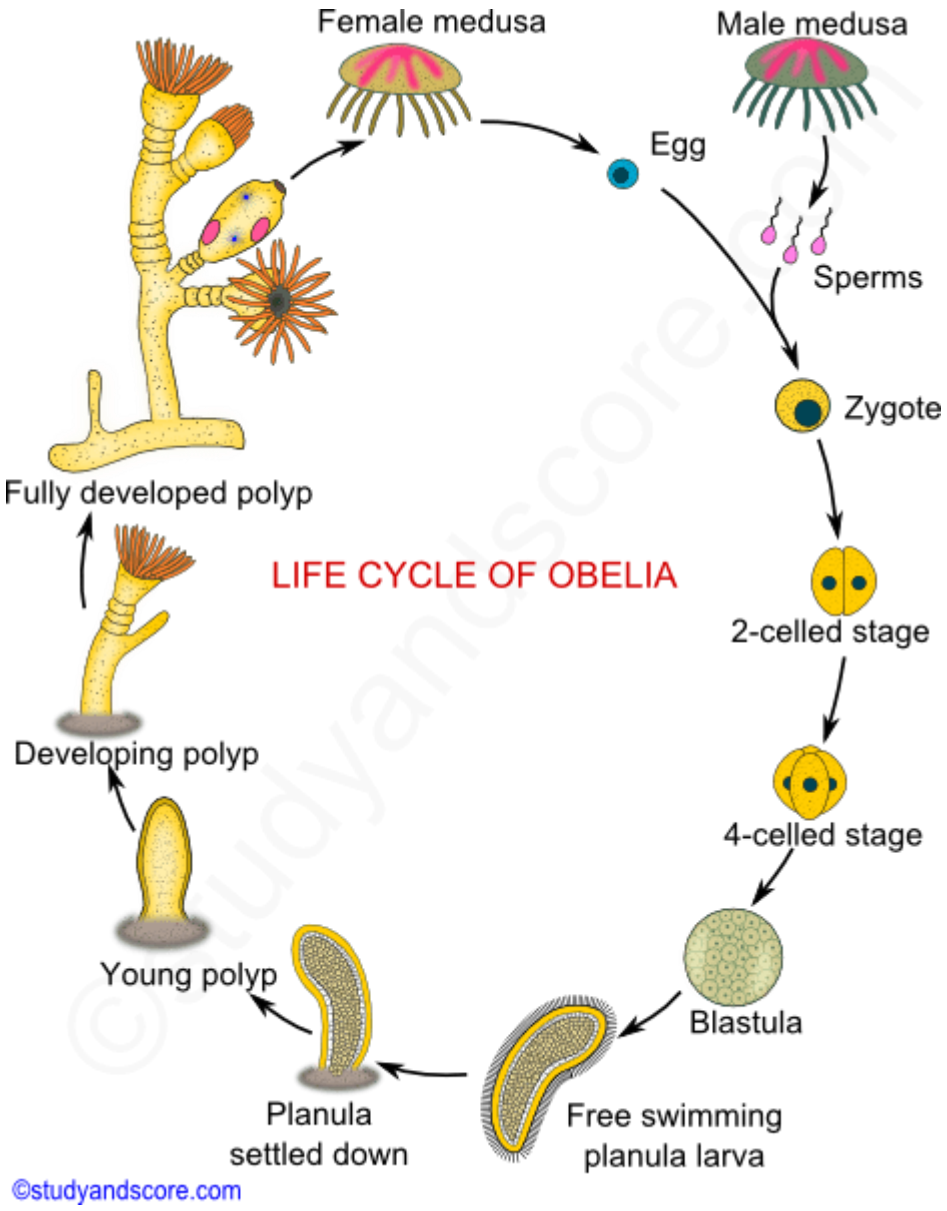
B.Sc. Zoology (H) Part-I Paper-I Group-A Topic- Life Cycle Of Obelia Lecture Notes By Dr. Arjun Pratap Singh

The primary function of the medusa is sexual reproduction. Obelia is dioecious as each medusa has reproductive organs of only one sex. There is no difference between the male and female medusae. The gonads (testis or ovaries) are four in number and lie on the sub-umbrella, below the radial canals, in the form of knobs. Thus gonads are per-radial in position. They are situated almost at equal distances between the manubrium and the velum. The gonads which arise as diverticula of the radial canals have the same structure as the body wall of medusa. The sex cells start developing very early when the medusa is being formed. These cells originate in the ectoderm of the manubrium, migrate to the endoderm and finally make their way to the gonads. They lie between the ectoderm of the sub-umbrella and the mesogloea.



Fertilization: The sperm and ova when fully formed are set free in water by rupture of the outer wall of the gonad. Sometimes the flagellated sperms swim about in water and fertilize the ova present in female medusae. The fertilization takes place in water. As medusa is the motile form, it performs two important functions for the colony namely reproduction and dispersal of the gametes.

Cleavage: The fertilized egg undergoes cleavage which is equal and holoblastic (complete). The blastula is a hollow boll consisting of single layer of cells enclosing the blastocoel. This cavity gets completely filled up with cells budded from the wall of the blastula. The embryo is now called stereo gastrula or solid gastrula. The embryo is set free from the egg membrane as a free-swimming larva called the planula. The larva swims about for some time and brings about wide distribution of the species. A cavity soon appears in the endoderm cell mass, which becomes the enteron.

Hydrula: After the free-swimming life the planula larva loses its cilia and settles down on the bottom of the sea, gets attached to the substratum by its broader end and undergoes metamorphosis. The attached or proximal end widens into a disc of attachment. A short distance from the free or proximal end a dilatation is formed. From this portion tentacles arise in a circle as short buds. The narrow portion beyond their origin becomes the hypostome. Soon an aperture, the mouth, is formed at the end of the hypostome. The young hydranth closely resembles a simple polyp like hydra and is called hydrula which undergoes repeated asexual budding to gives rise to complex Obelia colony.

Alternation of generation: Alternation of generation is also known as metagenesis. It is a phenomenon whereby, in the life history of an organism, a diploid asexual phase and a haploid sexual phase regularly alternate with each other.

In Cnidaria, two types of individuals exist namely a polyp and a medusa.

Polyp: The tube like zooid is called polyp. The polyp reproduces asexually It is sessile and attaches to a substrate at the aboral end. It has a cylindrical body called the column. Its mouth is surrounded by food-gathering tentacles.

The body structure of polyp form is simple with simple muscles and nervous system. Velum is absent. Mouth is circular without oral lobes. Also its gastro vascular cavity is simple without radial circular canals. Sensory organs are absent in this form. This form reproduces asexually by budding.

Medusa: The umbrella like zooid is called medusa. The medusa is dioecious and free swimming. Its shape is like an inverted bowl. The tentacles hang from its margins. The mouth opening is centrally located at lower side. The medusa swims by medusa than in a polyp. It gives the medusa a jellylike appearance.

The body structure of medusa form is complicated with well-developed muscles and nervous system. Velum is present around the margins of the umbrella shaped body. Also its gastro vascular cavity is well-developed with radial and circular

canals. Sensory organs called as statocysts are present on the margins of the tentacles. These forms reproduce sexually through gametes.

These two forms, polyp and medusa alternate successively where the polyp reproduce asexually to form a large number of medusa, each medusa reproduce sexually by the union of eggs and sperms to form zygote. The zygote grows into larva, which fix itself to a substrate and finally form a new polyp.