

2. PHYLUM COELENTRATA (CNIDERIA)

The word coelentrata is derived from Greek:

kolios → hollow

enteron → intestine

Hence the animals of this phylum have a hollow, sac like intestine.

CNIDERIA

Phylum Coelentrata is also called cnideria bcz the animals of this group have certain specialized cells, cnidocytes which give rise to nematocyst (special stinging cells).

HABITAT

Coelentrates are exclusively aquatic; majority live in marine environment but some live in fresh water as well.

CHARACTERISTICS

Most of the species are sessile e.g Hydra, free living and motile e.g Jelly fish, colonial e.g Obelia.

SIZE

They range in size from microscopic to two metres in length.

GRADE RADIATA

Animals of grade radiata have radial symmetry and can be divided into equal halves in many planes. The only phylum included in this grade is phylum coelentrata /cnideria.

DIPLOBLASTIC ORGANIZATION

Coelentrates have a diploblastic organization in which the cells are arranged in no tissues and organs. The outer layer is ectoderm and the inner layer is endoderm. In between the two layers, a jelly like, noncellular and nonliving material is present, called mesoglea.

~~ENDO~~ECTODERM

The ectodermal cells are not only protective in function but they also give rise to nematocyst.

ENDODERM

The cells of endoderm are specialized for digestion. They release digestive enzymes and also absorb the digested food.

GASTROVASCULAR CAVITY

They have a sac like internal ~~gastrointestinal~~ gastrovascular cavity or enteron which has only one opening the mouth. The gastrovascular cavity is associated not only with digestion but also with many other functions of the body of animal.

TENTACLES

In coelentrates mouth is surrounded by number of tentacles which bears organs of offence and defense called nematocyst. As soon as an organism touches the tentacles the nematocysts are fired with movement of tentacles the animal is brought to the mouth.

DIGESTION

Inside the gastrovascular cavity, the food is digested by the action of enzymes, released by the glandular cells of endoderm, which digest the food and the remaining undigested material is again thrown out of the mouth. The digested material is absorbed into the cells of endoderm lining the enteron through diffusion and is also provided to the cells of ectoderm.

Both type of digestion i-e intracellular and extracellular is found.

ZOOIDS

Cnidarians also occur in the form of colonies. The units of colonies are called zooids. There are two main types of zooids. Hydroids or polyps which are feeding zooids and Medusae are reproductive zooids, for sexual reproduction.

In some coelentrates there are special feeding zooids which are called 'gastrozooids' which perform only the function of nutrition for the whole colony. This arrangement is found in Obelia and the animals of order siphonophora.

NUTRITION

Coelentrates are carnivorous. Their food varies according to their size from zooplanktons, crustaceans, insect larvae to small fishes.

LOCOMOTION

In coelentrates locomotion is performed in many different ways. Although many coelentrates, especially colonial forms, are sessile and remain attached with certain object in the water e.g. obelia, corals etc. but a large number of coelentrates can move actively.

RESPIRATION AND EXCRETION

Respiration and excretion takes place by simple diffusion.

REPRODUCTION

Both asexual and sexual reproduction is found in coelentrates. Asexual reproduction is more common. It is performed either by budding or regeneration or rarely by fragmentation.

Sexual reproduction takes place by means of eggs and sperms which are ~~performed~~ produced in ovaries and testes. In most of the coelentrates, the sexes are separate.

JET-PORPULSION METHOD

Physalia pelagica, commonly known as "Portuguese Man of War", can swim at a rate of 12.1 cm/sec by the rhythmic contraction waves. Jelly fishes are fast moving coelentrates. They release water with force from their umbrella like body and move in the backward direction. This type of locomotion is called Jet-porpuulsion method.

NERVOUS SYSTEM

Nervous system consists of nerve net and some sense organs.

POLYMORPHISM

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A very important characteristic of coelentrates is the presence of polymorphism (Gr: Poly-many, morphe-form).

The existence of a single species in more than two morphological forms (individual types) is termed as polymorphism. These individuals are called zooids. The major types of zooids are Polyps (tube like body) and Medusae (umbrella like body).

METAGENESIS / ALTERATION OF GENERATION

Another very important phenomena found in coelentrates is alternation of generation or metagenesis. In this phenomenon asexual reproduction / generation alternates sexual generation.

For example, in obelia. The medusa form is that which produces gametes. Once fertilization occurs, the animal undergoes development and a free-swimming planular larva results. The planula settles and develops into a sessile polyp that can develop asexually via budding.

Polyp can differentiate into what appears like a colony in that the distal appendages are specialized for feeding or reproduction. The reproductive polyp, called blastostyle reproduces

into ~~saucer~~ saucer shaped medusae and the cycle continues. In this way a polyp produces a medusae and a medusa produces a polyp.

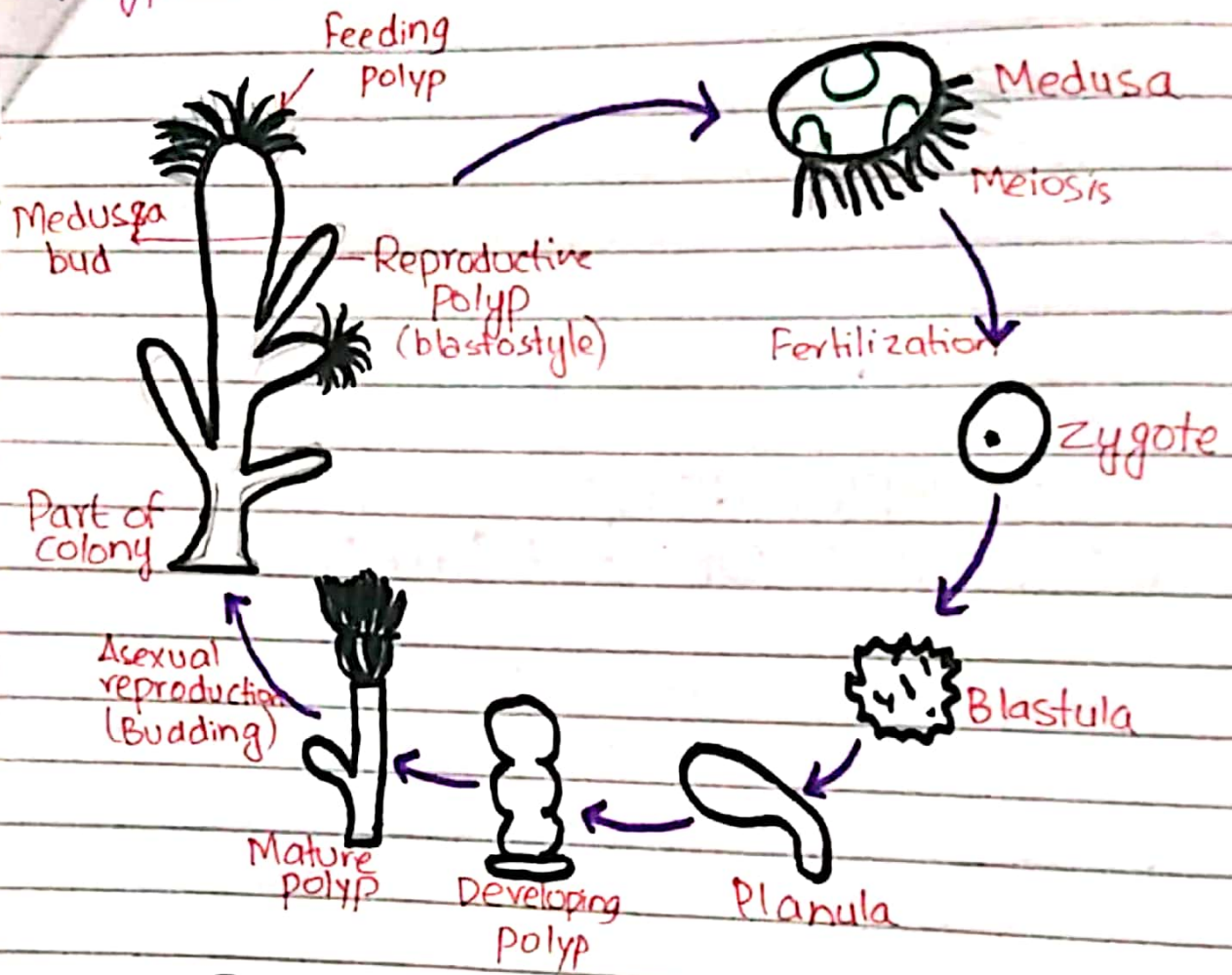


Fig: Alternation of generation

CORAL REEFS

Corals are cnidarians. It is made of $CaCO_3$. The ectodermal cells of the corals take lime from the sea water and form their exoskeleton. These exoskeleton form coral reefs and even island.

Coral Reefs may be defined as:

"Coral Reefs are the huge volumes of calcium carbonate in the sea formed by the skeleton of stony corals."

TYPES OF CORAL REEFS

Coral Reefs are of ~~four~~^{three} basic types:

1. Fringing Reef or Shore Reef
2. Platform Reef or Table Reef
3. Barrier Reef

1. FRINGING REEF OR SHORE REEF

Fringing Reef or shore reef is the simplest type. They are flat in structure and extend from the coast to few metres and sometimes to half a kilometer as a bench or platform.

2. PLATFORM REEF OR TABLE REEF

Platform Reef or Table Reef is a flat structure without a lagoon. It rests on the shallow ponds of continental shelves. They may appear between a coast and a barrier reef.

3. BARRIER REEF

Barrier Reef doesnot have any connection with land. A strip of sea water is always present between this reef and main land called lagoon. This strip maybe about 180 feet to 3 mile wide.

IMPORTANCE OF CORAL REEFS

1. Coral reefs are economically very important.
2. Reefs provide efficient ecosystem to a great variety of marine life.
3. Many invertebrates living in reefs provide food to fishes.
4. Reefs also provide good breeding habitats for fishes and in this way help to maintain fish population which in turn provide fish meat for human beings.
5. Corals being very brightly coloured are used as ornament or for manufacturing jewellery.

CNIDARIAN CLASSES

There are three classes in phylum cnidaria:

1. Class Hydrozoa
2. Class Scyphozoa
3. Class Anthozoa

1. CLASS HYDROZOA

Class Hydrozoa includes hydras, obelia, and the infamous Portuguese Man-of-War (an organism noted for its potent sting). Most hydrozoans exist in the polyp and medusa forms. e.g. obelia exists as an asexually reproducing polyp that alternates with a sexually reproducing medusa form.

2. CLASS SCYPHOZOA

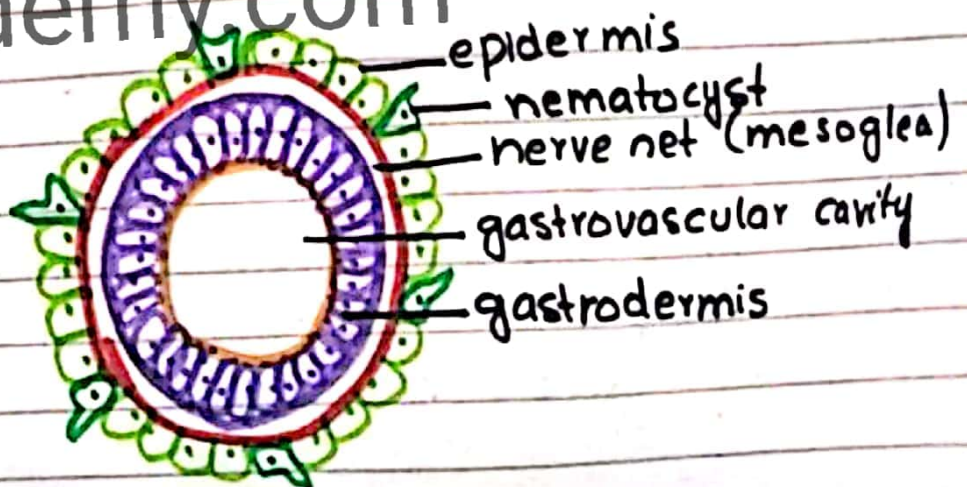
Class Scyphozoa includes the jellies (or jellyfish). Scyphozoans exist predominantly in the medusa form.

3. CLASS ANTHOZOA

Class Anthozoa includes sea anemones, corals, and sea fans. Anthozoans exist only in the polyp form.



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