

Hello and welcome to this session. I'm Sheena Paul, teaching at Government College of Arts, Science and Commerce, Quepem.. Today I'm dealing with the topic polymorphism in Hydrozoa, which is a part of the Chapter 3 phylum Cnidaria of the Zoology core paper Diversity of Non chordates and cell biology. This is module number 14 of this unit. The outline of this topic includes. Introduction to polymorphism, patterns of polymorphism, the basic forms, polyp, and medusa, and modifications of the polyp.

At the end of this module, the students would be able to explain the concept and patterns of polymorphism, describe the basic forms of polyp and medusa. and list out the characteristics and functions of the modifications of the polyp.

The term polymorphism is derived from 2 Greek words. Poly meaning many and morphe meaning form.

Therefore then, what is polymorphism? Polymorphism refers to a condition wherein the members of a single species may be represented by more than one kind of individual or zooid. which differ from each other. In structure form as well as function. In the entire Animal Kingdom, phylum Cnidaria exhibits the best example of polymorphism. As you already know, Phylum Cnidaria is divided into 3 classes. Class Hydrozoa Scyphozoa and Anthozoa.. Among these three classes, it is the class Hydrozoa which exhibits the widest range of polymorphic individuals. Even within this class, the degree of polymorphism varies greatly in the different orders of class Hydrozoa. The order Hydroida are of class Hydrozoa. exhibits polymorphism to a very less extent whereas the order Siphonophora and Chondrophora exhibit the highest number of polypoid and medusoid modifications.

Polymorphism follows a particular pattern. In case of Cnidarians, three different patterns, dimorphic trimorphic and polymorphic pattern. The dimorphic pattern is the simplest and the most common pattern of polymorphism exhibited by Hydrozoans. In this pattern there are just two different types of individuals which perform different functions and are morphologically different from one another. One is the hydranth or the gastrozooid which is meant to carry out the function of nutrition whereas the second one termed as gono zooid is meant for asexual reproduction. Obelia is a species of Hydrozoa which exhibits this dimorphic pattern of polymorphism. The Trimorphic pattern, as the name suggests, shows three different types of individuals. Gastrozooids for nutrition gonozooids meant for reproduction and in addition a third type of individual termed as dactylozooids are present meant for the defense of the colony. Plumularia is a species of Hydrozoa, which exhibits this trimorphic pattern of polymorphism. The last pattern of polymorphism is termed as the polymorphic pattern. wherein more than three types of individuals which differ in form and function are seen within the family. They might be the presence of gastrozooids for nutrition dactylozooids meant for the defense of the colony, tentaculozooids for sensory perception. Pneumatophores may be present for buoyancy or flotation and medusa would be present for reproduction. Halistemma is an organism which exhibits the polymorphic pattern in case of Cnidarians.

There are two basic forms that all Hydrozoans exhibit. One is termed as the polyp and the other one is termed as the Medusa. The polyp form comprises of an individual which is generally sessile or attached either to the substratum or to the colony, and exhibits an elongated tubular body. At the free end, which is termed as the oral end of the body, it shows the presence of the manubrium, the mouth which is

surrounded by tentacles. The second basic form is the medusa. These individuals may be free living and they show an umbrella shaped body. with an outer wall which is convex in shape called ex-umbrella and an inner wall which is concave, which is termed as the sub umbrella. Present running along the margin of the umbrella. There is a narrow shelf seen in many medusoid individuals. This narrow shelf is termed as the velum. The medusae which show the presence of the velum are called this craspedote medusa, whereas those without the velum are termed as acraspedote medusa. Hanging down from the center of the sub umbrellar surface in the medusoid individuals, there is a short hollow tube which is termed as the manubrium at the tip of the manubrium is present the mouth through which ingestion may take place. Surrounding the margin of the umbrella there is the presence of short hollow tentacles which are loaded with the nematocyst cells, which are the characteristic cells of all Cnidarians which help in defense as well as in food capture.

The modifications of the polyp. We have already talked about the two main basic forms of polymorphic individuals. Now each of those are variously modified. Here we will be taking up the modifications of the polyp. There are three different types of polypoid modifications that are met with, in hydrozoa. They are the gastrozooids for nutrition, the dactylozooids for defence and Predation and gonozooids for asexual reproduction.

Let's take up the first modification. That's the gastrozooid which are also termed as siphons, or hydranths. These are the individuals of the colony which are meant to carry out the function of nutrition. They're supposed to ingest food, digest it, and then circulate it to all the members of the colony. In these kind of individuals, the body is elongated and tubular or circular with a terminal mouth, which might be present either as a simple opening or it might be trumpet shaped. At the base of the Gastrozooid there is the presence of a long hollow contractile tentacle. which is either loaded with nematocysts directly or it may show the presence of many fine lateral branches which are called tentilla, on which the nematocysts are loaded. So this is an individual which is modified for carrying out the purpose of nutrition in the colony.

The second type of individual, which is again a polypoid modification, is termed as the dactylozooid. These dactylozooids may also be termed as palpons, feelers or tasters. The function of these dactylozooids is defense of the colony from its enemies or predators, as well as help in food capture. Structurally, the dactylozooid resembles the gastrozooid with respect to the shape of the body; they are tubular and elongated. But what is drastically different is that the free end of the individual is without a mouth. That means they cannot ingest any food. Also, at the base of the individual there is a presence of a long tentacle, again, which is similar to the gastrozooid, but the difference lies in the fact that this basal tentacle of the dactylozooid is never ever branched. These tentacles are again loaded with nematocysts, which are the special stinging cells of the Cnidarians. Sometimes these dactylozooids are found in association with the gonozooids. which is then termed as aganopalpan, and they're meant for the protection of the gonozooids. This was the second type of modification of the polyp.

The last modification of the polyp is termed as the Gonozooid which are also termed as blastostyles or as gonangia. The function of these gonozooids is to carry out the asexual reproduction of the colony. They produce medusae by the process of budding. These gonozooids, maybe placed on branched stalks which are called as gonodendrons and they're gonopores are placed as grape like clusters on these

gonodendrons. These are responsible for producing medusa by the process of budding. They may be provided with the gonopalpon, which is a modified dactylozoid meant for its protection.

These are the books that I have used in the referencing for the making of this module, thank you.