

N. N. SAIKIA COLLEGE, TITABOR

DEPARTMENT OF ZOOLOGY

SESSION : 2022-2023

Topic- “Polymorphism in Cnidaria”



SUBMITTED TO-

Priyanka Saikia

Department - Zoology

SUBMITTED BY –

Alok Kr. Gogoi

B.Sc. 1st Sem

ROLL NO : 58

Done
12/12/22

004

Content	
1	Certificate
2	Acknowledgment
3	Introduction
4	Aim and Objective
5	Methods and Materials
6	Observation
7	Discussion
8	Reference

Certificate

This is to Certify that the project is titled "Polymorphism in Chudaria". This project is submitted by Aksh Kumar Jagei of Nanda Nath Saikia college in fulfillment of the requirement for Bsc 1st Semester. This Project was an authentic work done by him under my supervision and guidance.

Date - 16/11/2022

Jayanka Saikia
N.N. Saikia college
Department of Zoology.

Acknowledgement

I would like to express my special thanks to my teachers Miss Priyanka Saitkia as well as HOD ma'am, who gave me the golden opportunity to do this wonderful project. This project also helped me in doing a lot of research and I came to know about so many new things.

I am extremely grateful to my parents and my friends, who gave me valuable suggestions and guidance for completion of my project. This cooperation and healthy criticism came handy and useful with them.

Hence, I would like to thank all the above mentioned people once again.

Alok Kumar Gogoi

BSc 1st Sem

Introduction

The Cnidaria were previously known as Coelenterata which sometimes included the Stenophora (now considered a separate phylum). Cnidarians are incredibly diverse in form as evidenced by colonial siphonophores, massive medusa and corals, box jellies with complex tentacles and hydroids and box jellies with complex eyes. Yet, these diverse animals are all armed with stinging cells called nematocytes. Cnidarians are united based on the presumption that their nematocytes have been inherited from a single common ancestor.

The common Cnidaria comes from the Greek word 'Cnidos' which means stinging nettle. Casually touching many cnidarians will make it clear how they got their name when their nematocytes eject barbed threads tipped with poison. Many thousands of Cnidarian species live in the worlds oceans, from the tropics to the poles, from the surface to the bottom. Some even burrow. A smaller number of species are found in rivers and fresh water lakes.

Aims, and Objective :

to study the polymorphism in *Cnidaria*

Methods and Materials

Polymorphism in Cnidaria, In order to prepare the project, books, internet, Youtube videos photographs etc have been used to obtain the necessary information for the project. The photographs attached to the project were collected from the internet. The tools required for this project are

1. Photograph
2. Pen
3. Pencil
4. books
5. The internet (Google, Youtube video etc)
6. A4 size paper etc.

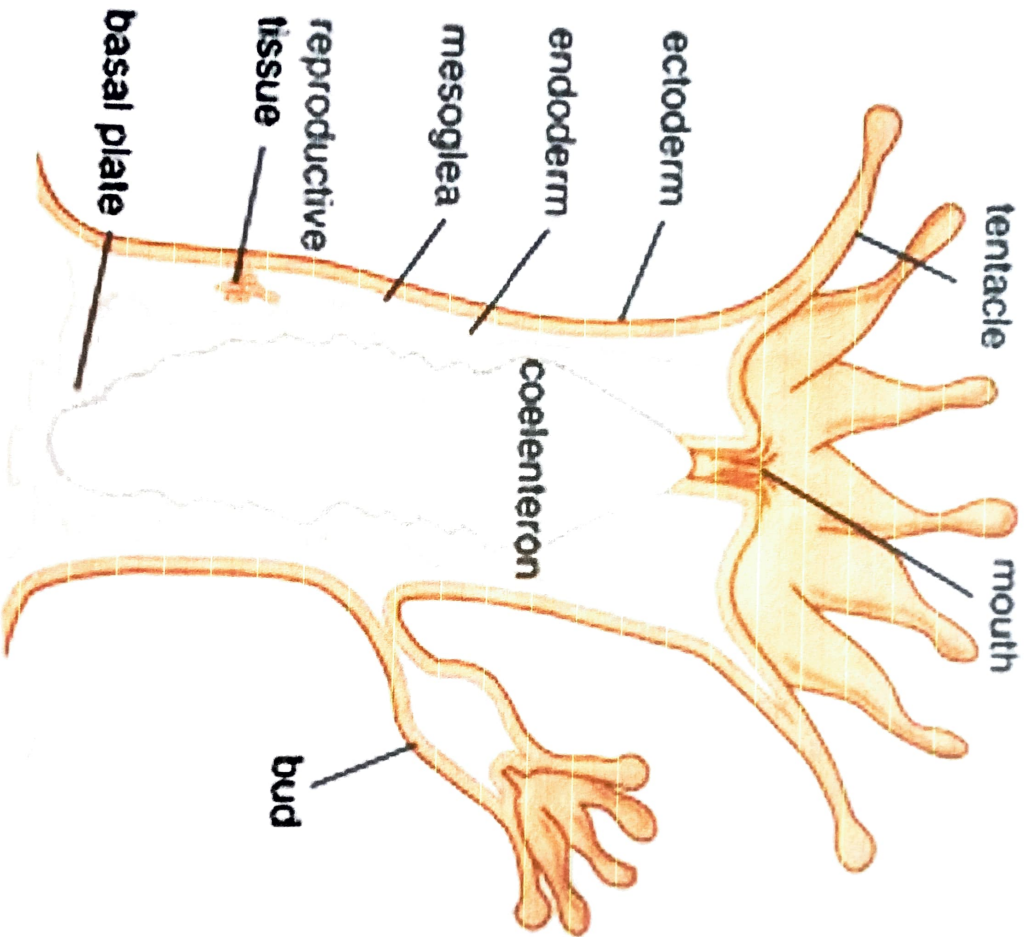
Observation :

The occurrence of more than one type of structurally and functionally different individuals within a population is called polymorphism. The class hydrozoa of phylum coelenterata includes a large number of colonial species that contain more than one form of individuals which are called zooids.

Coelenterates have two basic zooids, polyp and medusa. All other types of zooids are modifications of these two types of zooids.

4.1 - Polymorphic forms in Cnidaria :

Polyp has a tubular body with a mouth surrounded by tentacles at one end. Other end is blind and usually attached by a pedal disc to the substratum. Polyps are typically sessile.



Polyp

Medusa has a bowl or umbrella shaped body with marginal tentacles and mouth is centrally located in a projection called manubrium on the ventral concave surface. Medusae are generally motile and concerned with sexual reproduction.

4.1 — Modification of Polyp and Medusa :

Modification of polyp :

Gastrozooids or feeding zooids are typical polyps with a mouth and surrounding tentacles.

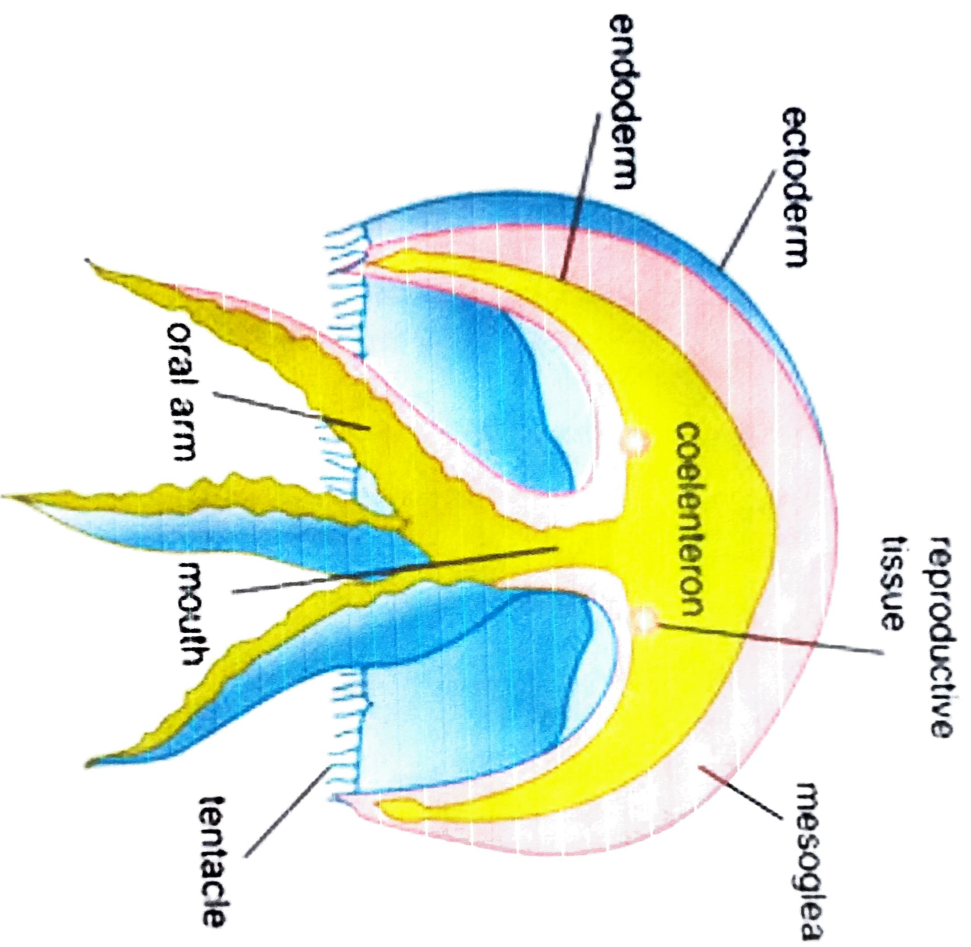
Dactylozooids which are used for defence are polyps without mouth and usually with a long basal tentacles.

Gonozooids are reproductive zooids derived from polyp, which produce sexual medusae or gametophores.

Modifications of Medusa :

Nectophore or nectocalyx or swimming bell, modified for sexual reproduction.

Pneumatophore or float is a bladder like modified medusa filled with mixture of gases and helping the colony to float on the surface.



Medusa

Phyllozoid or bract is leaf like zooid, studded with nematocysts and serving to protect the colony.

4.3 — Types of Polymorphism :

A few Coelenterates, such as Hydra and sea anemone are monomorphic in which only polyp stage is found but other coelenterates exhibit polymorphism.

Dimorphism : Many Hydrozoan colonies like Tubularies and Campanularia have only two types of zooids, the feeding zooids or gastrozooids and medusae or nectophores that bud off from the stem or gastrozooids. These are dimorphic colonies in which blastostyles are not present.

Trimorphism : Some species like Obelia and plumularia are trimorphic because besides gastrozooids and Medusa they also have medusa producing gonozooids or blastostyle.

Poly morphism : Coelenterates having more than three types of individual are called polymorphic, example, Hydra, which has five types of zooids, each performing a specialized function. Gastrozooids are for feeding. Spiral dactylozooids for protection, long tentaculozooids having sensory function. Scyphozooids are stony projections of chitin for protection and gonozooids are reproductive zooids that produce male or female medusae.

Highly modified polymorphism :

In order Siphonophora, such as Diphyes, Thaliasteria, Stephanosia and Physalia, zooids are so much modified that they appear like organs of a single body rather than individuals of a colony. They are mostly pelagic in habit in Physalia, zooids are in units called cornidia, which bear gastrozooids, small and large dactylozooids with long and short tentacles and branched gonozooid with gonophores.

4.4 - Origin of Polymorphism °

There are two theories - to explain the origin of polymorphism in coelenterates.

Polyorgan theory °

This theory was proposed by Huxley (1859) and Metschnikoff (1874), according to which individuals of a colony are actually organs of a medusoid individual, which have multiplied and migrated from their primitive positions to the current evolved positions.

Polyperson theory °

This theory was first proposed by Leuckart (1851), Vogt (1848), Gegenbaur (1854), Kolliker (1853), Cuvier (1863), Balfour (1885) and Sedgewick (1888). According to this theory colony is not a single individual but various parts of the colony are modified individuals which have changed their structure due to division of labour. They have all modified from the primitive zoid which was poly.

Medusome theory:

This theory was proposed by Haeckel (1888) as a compromise between the above theories. The theory says that the Siphonophore larva forms from gastrula was a medusoid individual, from which zooids or persons appeared by budding from the subumbrella.

Discussion :

The Phenomenon of Polymorphism is essentially one of division of labour in which specific functions are assigned to different individuals.

Thus, polyps are modified for feeding, protection and asexual reproduction, while medusae are concerned with sexual reproduction. This distribution of functions among diversified individuals and their subsequent modifications in coelenterates may have resulted from their initial simple organization and lack of organ specialization. Polymorphism gave the colonies competitive edge in protection and food gathering and eventual survival polymorphism.

Colonies of some species have morphologically differing individuals each specialized for certain roles, example - feeding, reproduction and defence etc.

Reference

- * Principles of Ecology by Manideep Raj
- * <https://g.co/kgs/etrV5n>.