

TOPIC: POLYMORPHISM

LECTURE NO:17

B.SC PART 1

ZOOLOGY(HONS.)-PAPER I-GROUP A

CHAPTER 5

DATE: 15TH MAY 2020

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Polymorphism:-

Meaning of polymorphism:

Occurrence in the same species of more than one type of individuals, which differ in form and function, is known as polymorphism (Gr., Polyps- many or several + Morphe-form). This ensures an efficient division of labor between the several individuals.

Two basic forms:

In hydrozoa (or coelenterates), which may be single or colonial, there occur two main types of individuals or zooids-polyps and medusa.

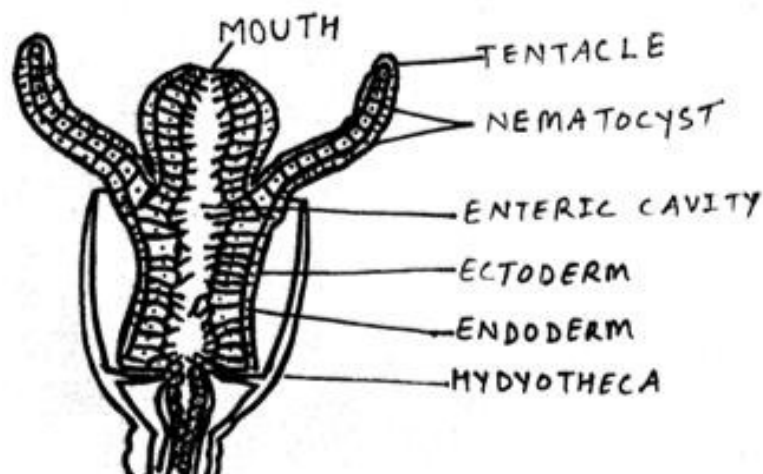


Fig. Obelia :V.S of Polyp

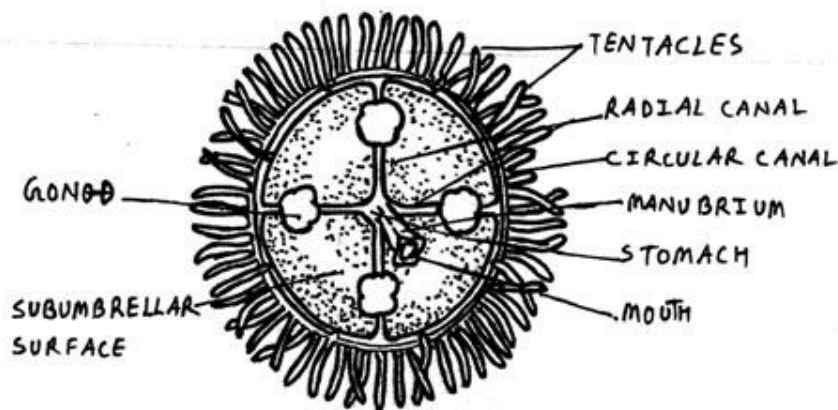


Fig. Medusa in Oral View

Patterns of polymorphism:

Degree of polymorphism varies greatly in different groups of Hydrozoa.

Dimorphic- simplest and commonest pattern of polymorphism is exhibited by many hydrozoan colonies like obelia, tubularia, etc. They have only one type of zooids (individuals). Gastrozooids or hydranths are concerned with feeding, while gonozooids or blastostyles with asexual budding forming sexual medusa or gonophores. Such colonies, bearing only two types of individuals are called dimorphic, and the phenomenon is termed dimorphism.

Trimorphic- some forms, like plumularia, are trimorphic. Besides gastrozooids and gonozooids, they also possess a third type of individuals, the dactylozooids. These are functionally non-feeding and defensive polyps bearing batteries of nematocysts.

Polymorphic- coelenterates having more than three types of individuals are called polymorphic. Polymorphism is found in the encrusting colony of *Hydractinia* (Fig.27) and *Calycophoran* or *Siphonophora* (Fig.23) with five types of polyps, each performing a specialized function. These are

- (i) Gastrozooids for feeding,
- (ii) Spiral dactylozooids for protection,
- (iii) Long sensory tentaculozooids with sensory cells,
- (iv) Skeletozooids as spiny projections of chitin, and
- (v) Gonozooids or reproductive individuals, bearing male or female gonophores (sporosacs) or medusa for sexual reproduction.

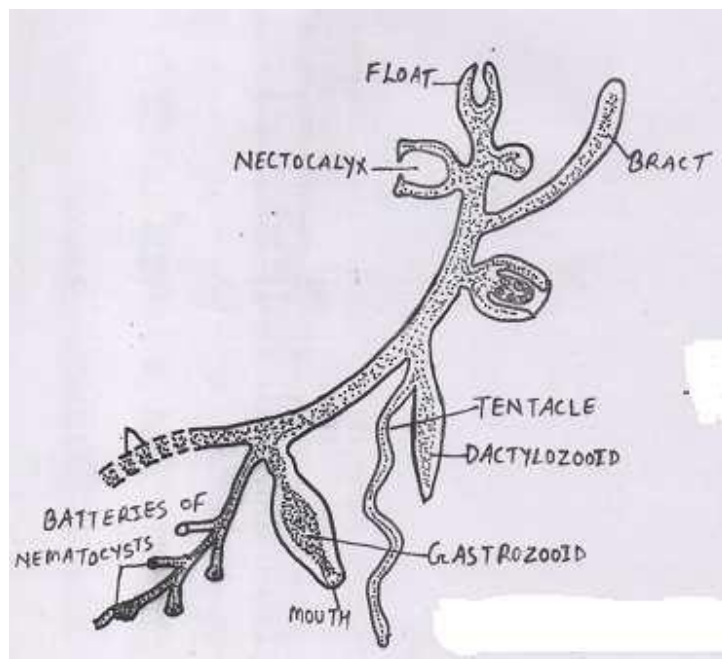


Fig.23 Calycophoran

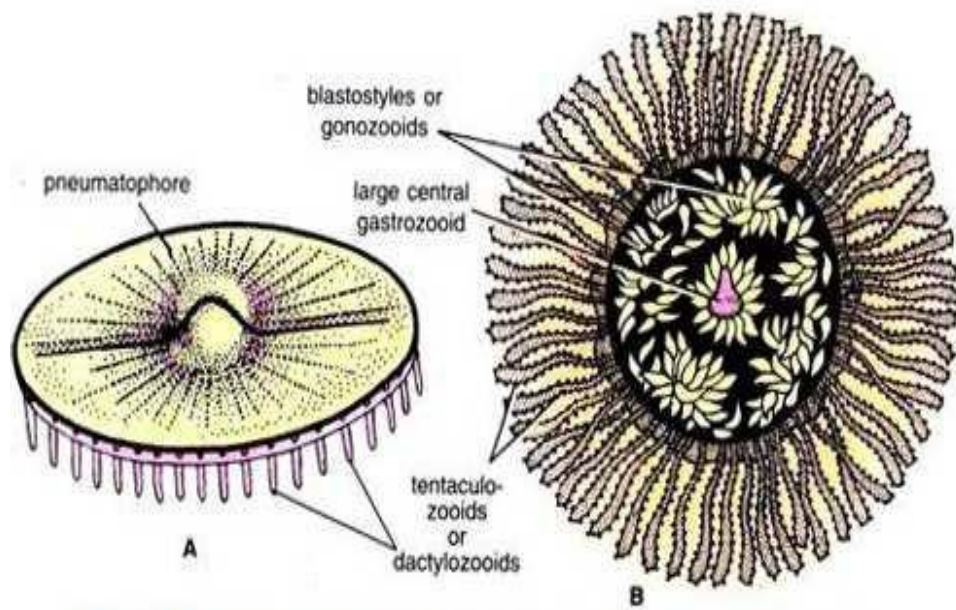


Fig. Porpita (A) Dorsal (B) Ventral

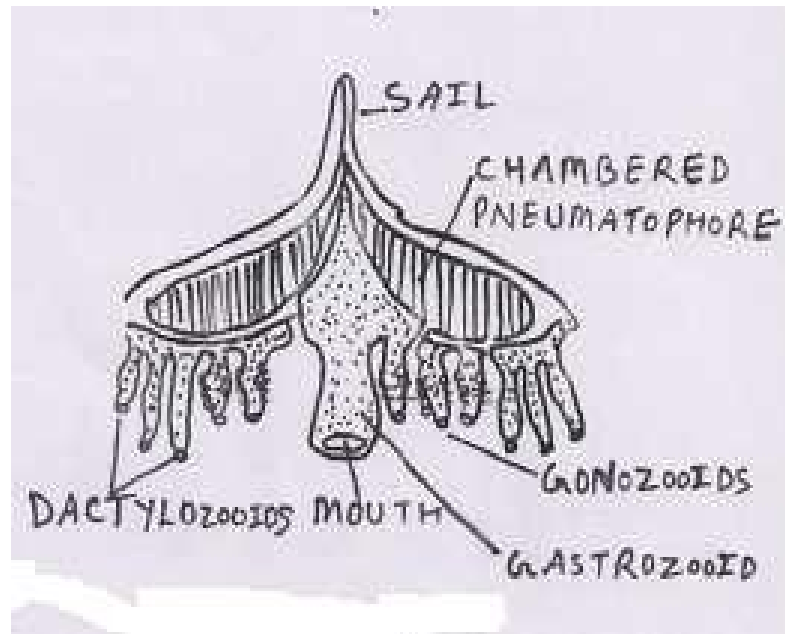


Fig. Vellella

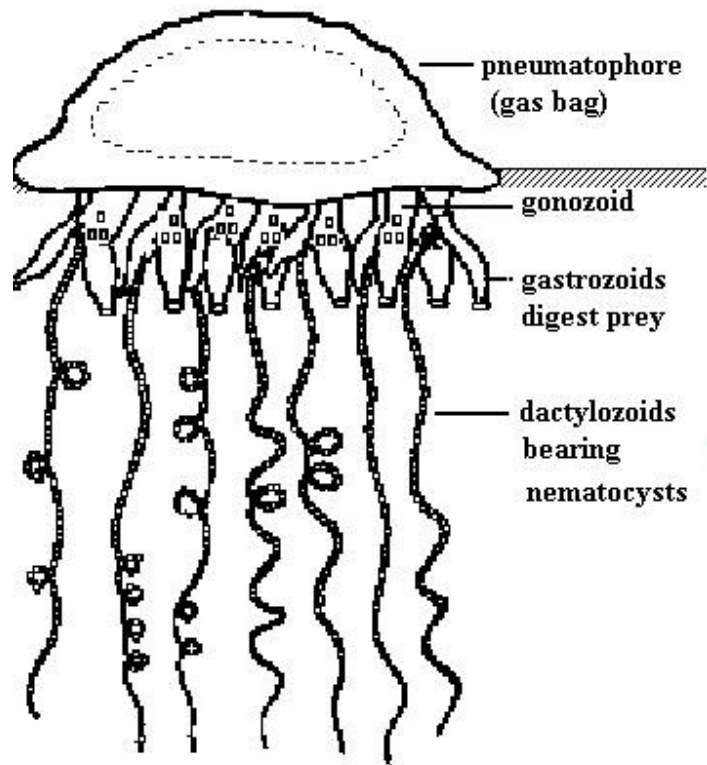


Fig. Physalia

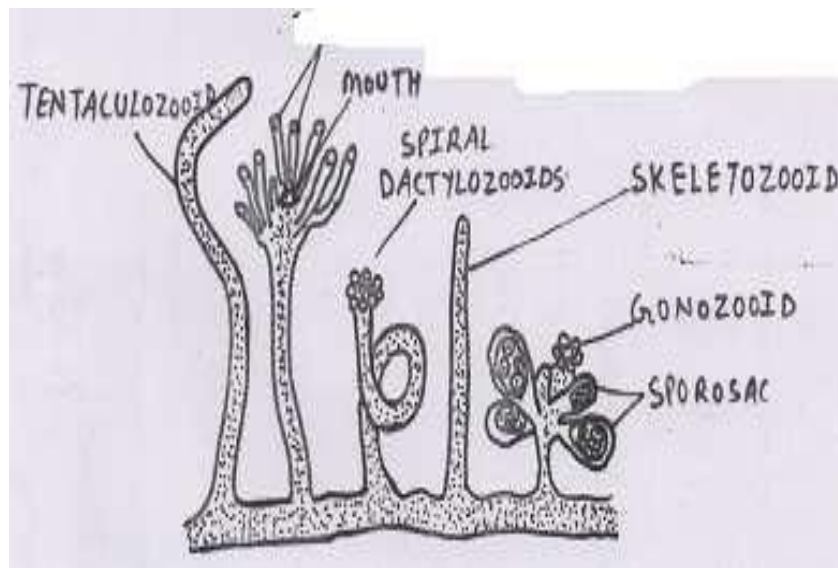


Fig. Hydractinia

Extreme examples of polymorphism are seen in the pelagic or swimming colonies of the orders siphonophora (Diphyes, Halistemma, Stephalia, and Physalia,) and

chondrophora (Porpita, and Velella,). As in Hydractinia, both polypoid and medusoid individuals, specialized for various vital functions, occur in the same colony.

Polymorphism reaches its peak in siphonophora.

(a) **Modifications of polyps-** Polypoid individuals include:

Gastrozoid or feeding polyp with a mouth and a long tentacle.

Dactylozoid or protective polyp without mouth and usually with a long basal tentacle.

Gonozoid or reproductive polyp which produces sexual medusa or gonophores.

Modifications of medusa- The medusoid individuals are of the following types:

Nectophore or nectocalyx or swimming zoid with a muscular bell without manubrium or tentacles.

Pneumatophore or float as a bladder-like medusa filled with secreted gas.

Phyllozoid or bract, usually leaf-like and studded with nematocysts, serving for protection of other zooids.

Gonophore bearing gonads, which may be either male, producing sperms, or female producing ova.

Importance of polymorphism:

Polymorphism is essentially a phenomenon of division of labour. Different functions are assigned to different individuals, rather than to parts or organs of one

individual. Thus, polyps are concerned with feeding, protection and asexual reproduction, while medusas are concerned with sexual reproduction.