

Polymorphism in Cnidaria

Polymorphism (Gr., *poly* = many + *morph* = form) is a phenomenon in which an organism has more than one type of individuals. It is more evident in class Hydrozoa and Anthozoa of Cnidaria/Coelenterata.

Coelenterates are basically colonial forms. Individuals of a colony of coelenterates are called **zooids**. These zooids are of two basic types: polyps and medusae.

1. Polyps. Polyps are cylindrical, sessile and fixed forms. These have mouth surrounded by tentacles and a wide gastrovascular cavity. These are the **nutritive zooids** of the colony, so, feed the colony. Polyps are also called **gastrozooids** or **trophozooids**.

2. Medusae. Medusa has an umbrella-like body with marginal tentacles and a centrally located mouth on a concave side. They bear gonads and help in sexual reproduction. Therefore, these are called **sexual zooids** or **gonozooids**. They are free swimming and derived from polyps.

Hydromedusae. The medusae of class Hydrozoa are called **hydromedusae**. They are of following types:

1. Trachymedusae. Bell margin of these medusae are not scalloped. These medusae contain long manubrium or pseudomanubrium. In them gonads are present on radial canals, e.g., *Aglantha* (Fig. 20.1A).

2. Narcomedusae. Bell margin of these medusae are scalloped. These medusae contain reduced radial canals and lack manubrium. In them gonads occur on the floor of gastric cavity, e.g., *Cunina* (Fig. 20.1B).

3. Anthomedusae. These medusae are taller, retain the tetra-rotate form, have gonads on the manubrium and usually have ocelli, e.g., *Sarsia* (Fig. 20.1C), *Pennaria* (Fig. 20.1D) and other gymnoblasts.

4. Leptomedusae. These medusae are flatter, may have lost their tetra-rotate symmetry by branching of the radial canals, have gonads borne on these canals. They have statocysts on the bell margin, e.g., *Obelia* (Fig. 20.1G), *Tima* (Fig. 20.1F), *Aequora* (Fig. 20.1E) and other leptomedusae.

20.1 TYPES OF POLYMORPHISM

According to the types of zooids, coelenterates may be of following types:

1. Dimorphic having two types of zooids.
2. Trimorphic having three types of zooids.
3. Polymorphic having more than three types of zooids.

Dimorphism

The coelenterate colonies bearing two types of individuals or zooids are called **dimorphic**. Such colonies and the phenomenon is termed **dimorphism**. For example, *Bougainvillea*, *Pennatula*, consist of two types of zooids: 1. **Polyps**, the gastrozooids or trophozooids and 2. **Medusae**, sexual zooids.

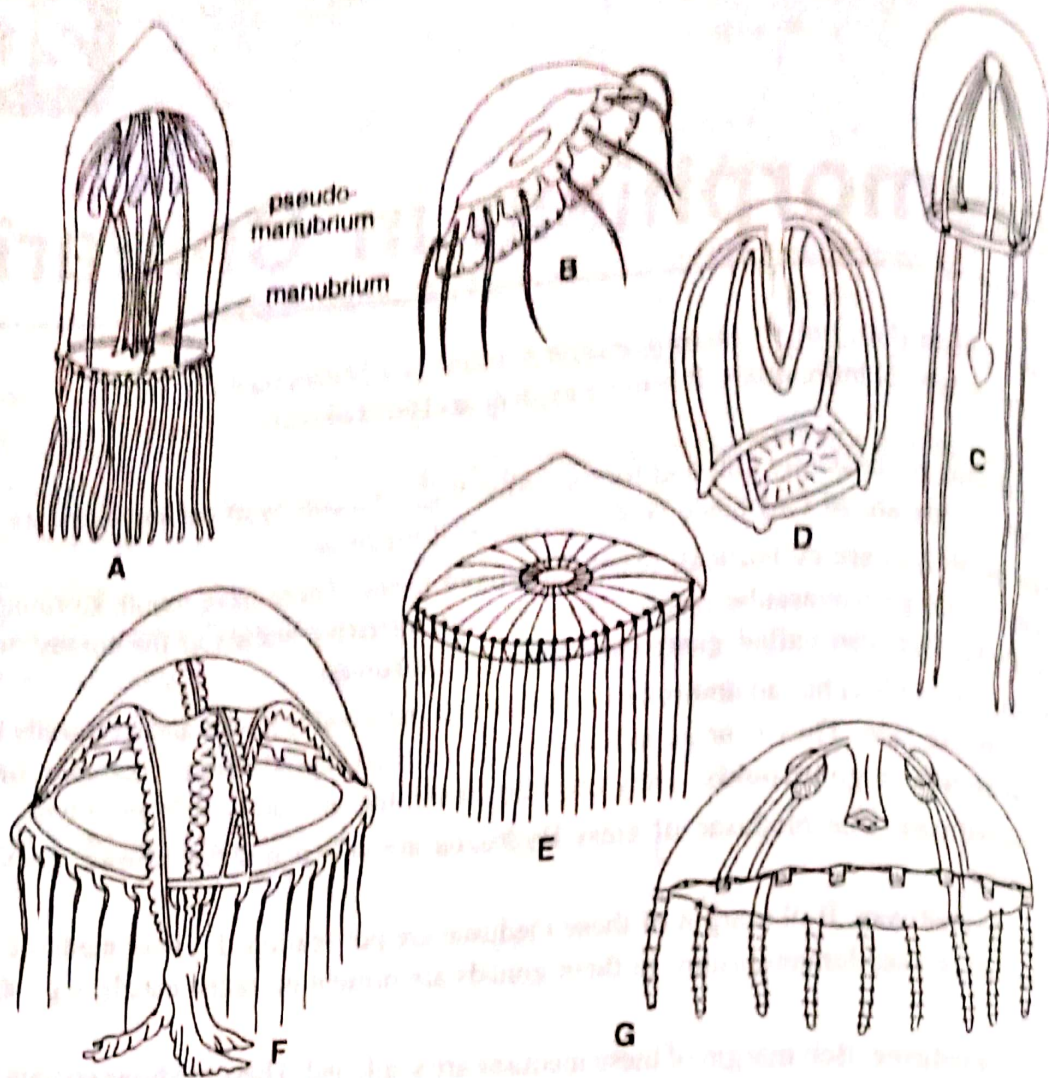


Fig. 20.1. Hydromedusae. A—Trachymedusa (*Aglantha*); B—Narcomedusa (*Cunina*); C—Anthomedusa (*Sarsia*); D—Anthomedusa (*Pennaria*); E—Leptomedusa (*Aequora*); F—Leptomedusa (*Timonema*); G—Leptomedusa (*Obelia*).

Pteroids, *Corallium*, *Pennatula*, etc., of class Anthozoa show dimorphism and have two types of polyps: (1) **Autozooids** or **gastrozooids** feed the colony. (2) **Siphonozooids** circulate water currents through the gastrovascular cavities of colony and bear gonads too. They lack a medusa stage in their life cycle.

2. Trimorphism

The coelenterate colonies bearing three types of zooids are called **trimorphic colonies** and the phenomenon is termed **trimorphism**. For example, *Obelia* colony has—

- (i) Polyps or gastrozooids
- (ii) Blastostyles or blastozooids or gonozooids which bear medusae
- (iii) Medusae or sexual zooids.

In *Millipora*, *Plumularia*, etc., the zooids are of following three types:

- (1) **Gastrozooids**. These are the polyps or nutritive zooids.
- (2) **Dactylozooids**. These are the protective zooids with long and knobbed tentacles
- (3) **Medusae**. These are gonads-bearing sexual zooids.

3. Polymorphism

In some coelenterates both polyps and medusae are of various types and are modified to carry out different functions of the colony. For example, siphonophores (*Halistemma*, *Physalia*, *Verella*, *Porpita*, etc.) are invariably free swimming, colonial and polymorphic. The polyps and medusae are differently modified to present a large variety of zooids. The **polypoid zooids** of siphonophores are of three types:

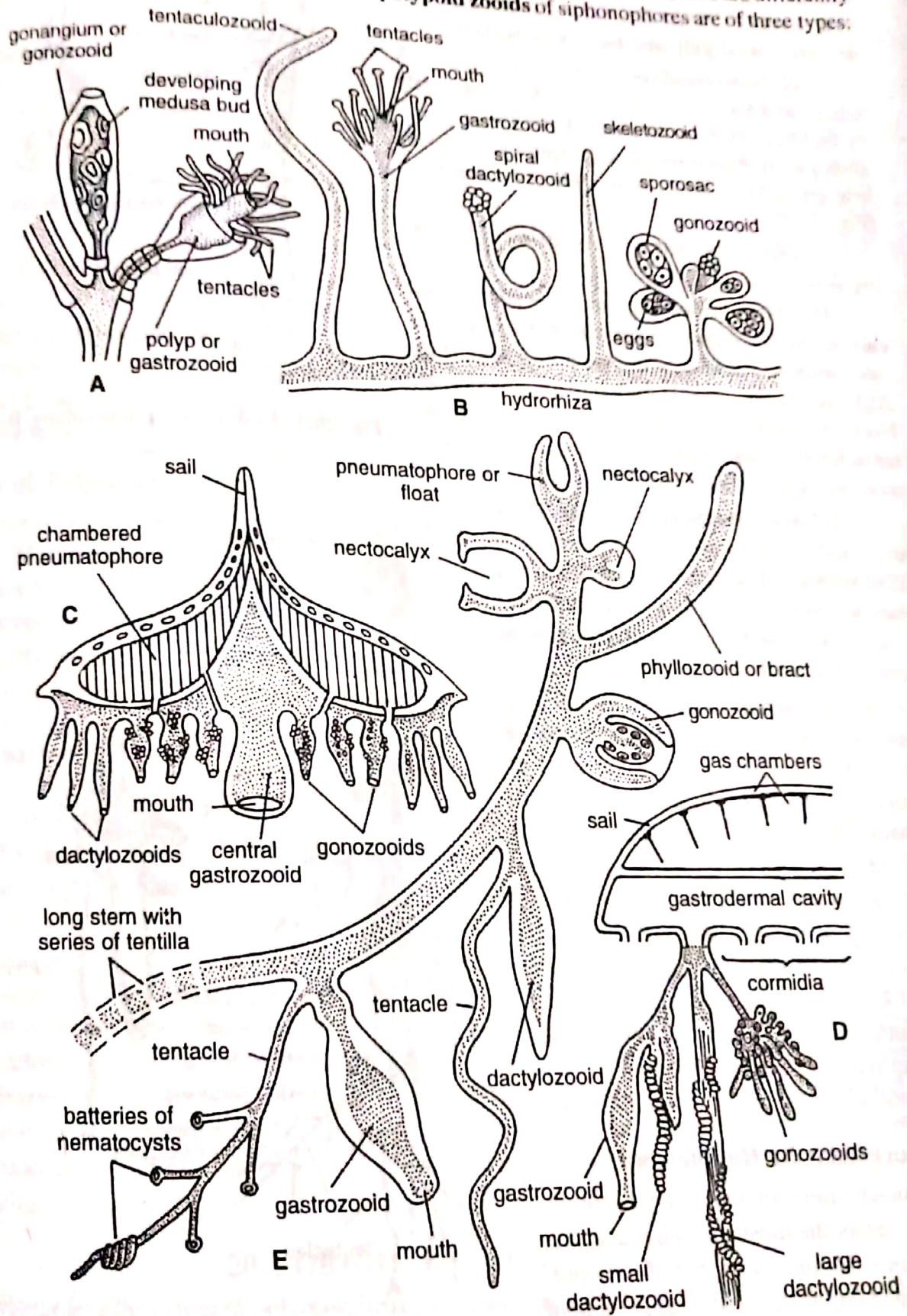


Fig. 20.2. Polymorphic colonies of cnidaria. A—*Obelia*; B—*Hydractina*; C—*Verella*; D—A single cornia of *Physalia*; E—Generalized calycophoran Siphonophora showing different zooids.