

### Subphylum: Urochordata (Tunicates)

The subphylum Urochordata, also known as Tunicata, includes marine organisms commonly known as tunicates or sea squirts. Urochordates are chordates, meaning they possess certain characteristic features such as a notochord, dorsal hollow nerve cord, pharyngeal slits, and a post-anal tail at some point in their life cycle. Their chordate characters are more pronounced during larval period. While in adults they are more like invertebrates than chordates.

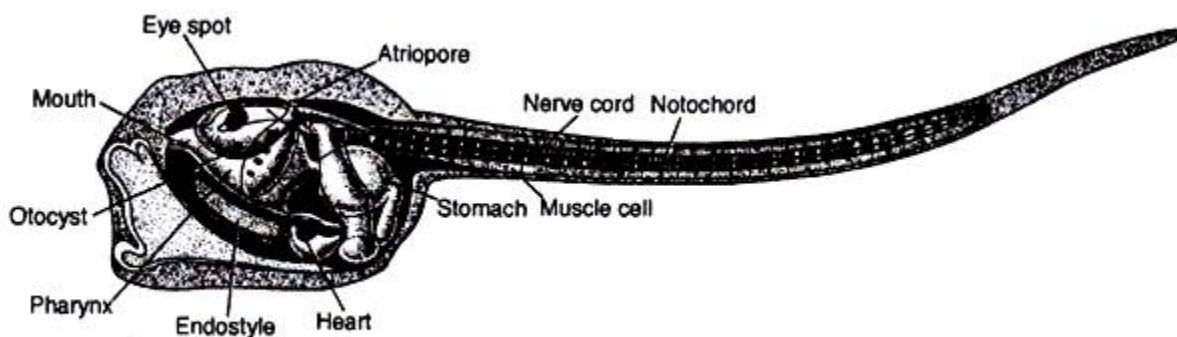
Key features and characteristics of Urochordates:

#### a. Tunicate Body Structure

- Adult urochordates typically have a sac-like body covered by a tough outer tunic or exoskeleton composed of cellulose.
- The tunic surrounds the body and gives these organisms their name.

#### b. Life Cycle

- The life cycle of urochordates usually involves both a sessile, filter-feeding adult stage and a free-swimming larval stage.
- These are hermaphrodite animals; reproduce both sexually and asexually.
- The larval stage, called a tadpole larva, exhibits more typical chordate characteristics, including a notochord and a post-anal tail.



A diagrammatic longitudinal sectional view of an ascidian larva

#### c. Filter Feeding

- Adult tunicates are filter feeders, drawing in water through their siphons and filtering out particles, such as phytoplankton, through a mucous net.

#### d. Chordate Characteristics

- Urochordates exhibit chordate characteristics during their larval stage but may lose some of these features as they undergo metamorphosis into the adult form.

- The notochord is usually present in the larval stage but is often reduced or lost in the adult form.

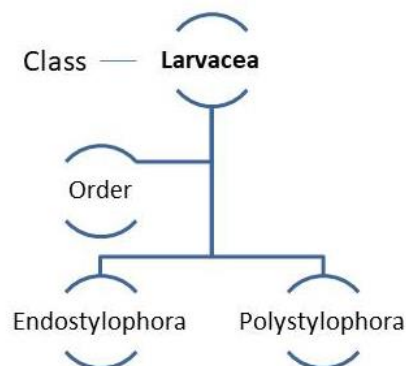
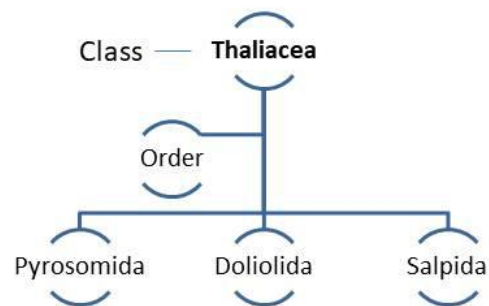
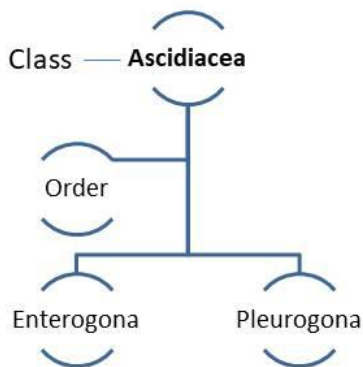
#### e. Pharyngeal Slits

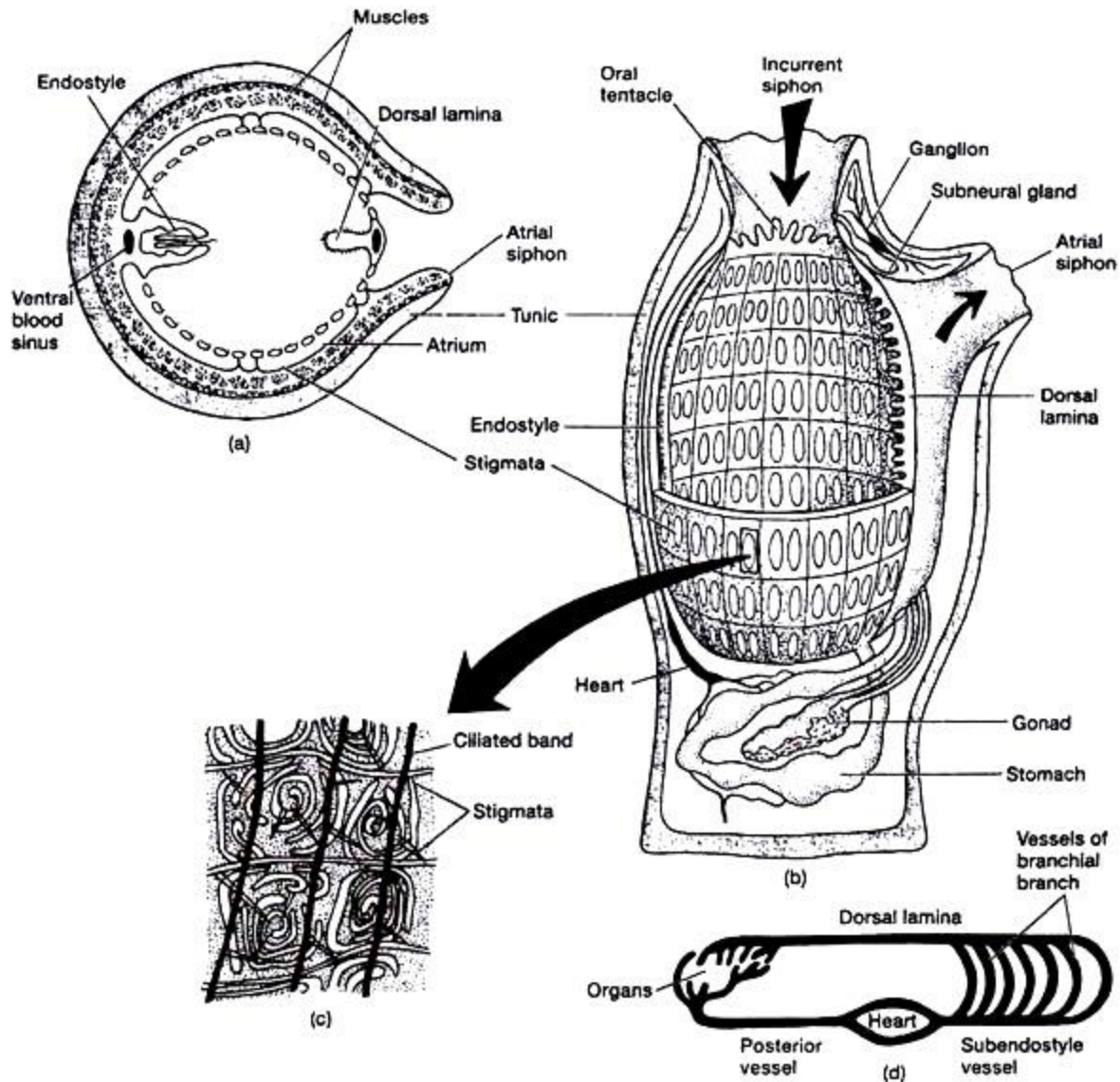
- Urochordates have pharyngeal slits, which are openings in the pharynx that allow water to pass through. In the larval stage, these slits are involved in filter feeding.

#### f. Nervous System

- Urochordates have a simple nervous system with a dorsal hollow nerve cord spreads end to end.

Orders in Urochordata:





(a) Schematic cross-sectional view of an ascidia. (b) One side of the body opened to show internal structures. (c) Structure of several highly subdivided pharyngeal gill slits. (d) Flow diagram of urochordate circulation

Urochordates are important in evolutionary studies as they represent a transitional group between invertebrates and vertebrates. Their chordate characteristics, albeit often only present in the larval stage, provide insights into the evolutionary development of more complex vertebrates.