

# Urochordata

## General characters

Exclusively marine commonly known as **sea squirts**  
Solitary or colonial.  
Fixed or free-swimming.  
body covered by a cuticular tunic or test  
in adult stage.

Notochord present in the larval stages

and absent in the adult.  
Dorsal, tubular nerve cord is present  
in the larval forms, while degenerates  
in the form of small ganglion in adults.

Numerous gill-slits are present.  
Heart is ventral, simple and tubular.

Sexes are ~~so~~ united, hermaphrodite.

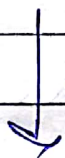
# Urochordata

Larvacea



eg Dikoplaeoa

Ascidiacea



- Ascidiae simplices
- eg → Herdmania
- Clona
- Ascidia
- Molgula
- Botryllus
- Pyrosoma

Thaliacea



eg → Salpa



Indian, West Indies.

## 8. Ciona

### Classification :

Phylum	...	<b>Chordata</b>	→ Dorsal tubular nerve cord, notochord, and paired gill-slits are present.
Group	...	<b>Protochordata</b>	→ Marine and small forms. Cranium, jaws and paired appendages are absent.
Subphylum	...	<b>Urochordata</b>	→ Solitary or colonial, fixed or free-swimming with cuticular test containing tunicin.
Class	...	<b>Ascidiacea</b>	→ Well developed and permanent test. Branchial-sac large perforated by numerous gill-slits.
Order	...	<b>Ascidiae simplices</b>	→ Solitary forms exhibit retrogressive metamorphosis.
Genus	...	<b><i>Ciona</i></b>	

### Characters :

1. *Ciona* is solitary and marine form, found attached to rocks, etc.
2. Body is cylindrical, tubular, transparent and longer than broad.
3. It may reach the length of 3.5 to 5 inches.
4. The body is covered by a thin transparent test or mantle.
5. Mouth opens into **branchial siphon** and anus into the **atrial siphon**.

6. Branchial aperture is 8-lobed and atrial aperture is 6-lobed.
7. Pharynx without longitudinal folds.
8. Alimentary canal is U-shaped and consists of pharynx, oesophagus, stomach and intestine.
9. Stigmata is rectangular.

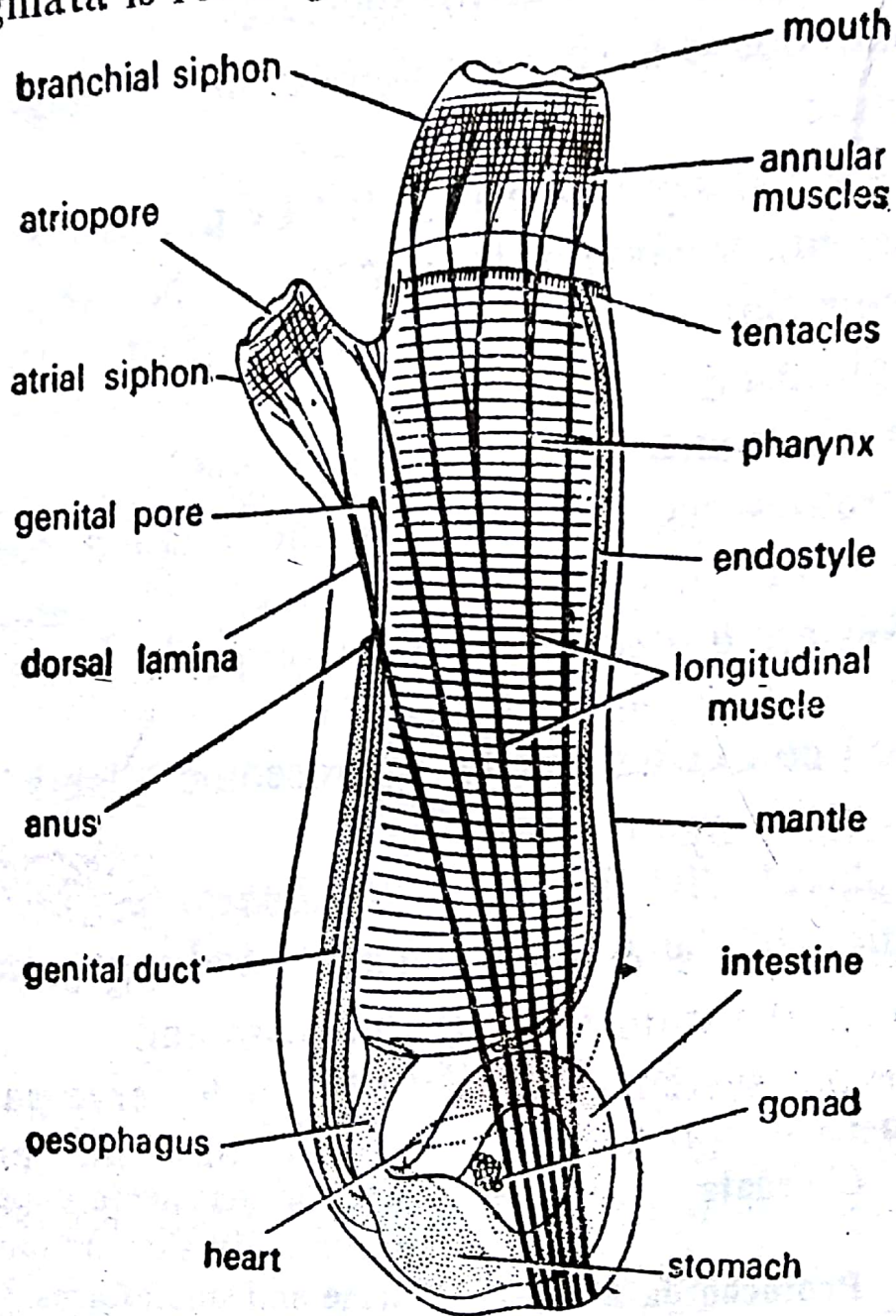


Fig. 63. *Ciona*.

10. Dorsal tubercle is horse-shoe-shaped.
11. Hermaphroditic and protogynous. Gonads lie in the loop of intestine.

**Geographical distribution :** *Ciona* is commonly found in Western regions.

### 9. Ascidia



Doliolum

**Classification :**

Phylum ...	Chordata	→ Dorsal tubular nerve cord, notochord and paired gill-slits are present.
Group ...	Protochordata	→ Marine and small forms. Cranium, jaws and paired appendages are absent.
Subphylum ...	Urochordata	→ Solitary or colonial, fixed or free-swimming with cuticular test containing tunicin.
Class ...	Thaliacea	→ Free-swimming pelagic, solitary or colonial. Muscles in the form of circular bands. Exhibit an alternation of generation.
Order ...	Cyclomyaria	→ Muscle bands are always complete surrounding the body.
Genus ...	<i>Doliolum</i>	

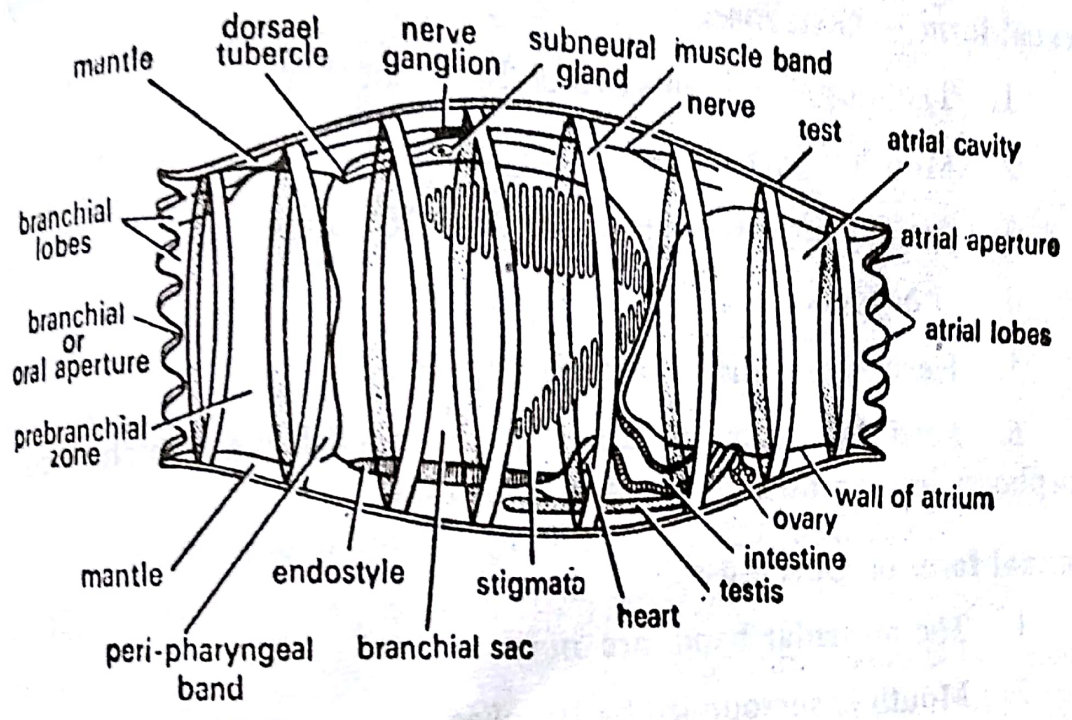


Fig. 69. *Doliolum*.

**Characters :** *Commonly called chain tunicata.*  
*Doliolum* is a free-swimming, pelagic form inhabiting the warm water.

**General organisation :**

1. Body is barrel-shaped with the mouth and anus at opposite ends.
2. The test or tunic is thin, transparent and contains no cells.
3. The open ends of the barrel are fringed with lobes.
4. The oral funnel opens broadly into the voluminous pharynx.
5. Pharynx is perforated by dorsal and ventral rows of stigmata

6. Endostyle and peripharyngeal ciliated bands are present in the pharynx.
7. Dorsal lamina and tentacles are absent.
8. Small stomach and a short intestine and the anus opens almost posteriorly.
9. Dorsal ganglion and subneural glands are situated near the anterior end.
10. Hermaphrodite.
11. Life cycle exhibits an alternation of sexually mature adult, the gonozooid with the asexually reproducing phase, the oozoid.

#### Sexual form or Gonozooid :

1. The muscular bands are eight in number.
2. Mouth is surrounded by 12 lobes.
3. Atrial aperture is surrounded by 10 lobes.
4. Otocyst is absent.
5. Hermaphroditic. Gonads unpaired.
6. Fertilized ovum gives rise to a tailed-larva which metamorphoses into an asexual zooid, the oozoid.

#### Asexual form or Oozoid :

1. The muscular bands are nine.
2. Mouth is surrounded by 10 lobes.
3. Atrial aperture is surrounded by 12 lobes.
4. Otocyst present.
5. Alimentary canal atrophied
6. Heart and nervous system are present.
7. Asexual form reproduces by budding and gives rise to gastrozooid, phorozooids and the sexual forms the gonozooids.

**Geographical distribution :** *Doliolum* is found in tropical and subtropical waters.



15. **Salpa**

**Classification :**  
 Phylum ... Chordata  
 Group ... Protochordata  
 Subphylum ... Urochordata  
 Class ... Thaliacea  
 Order ... Hemimyraria  
 Genus ... *Salpa*

- Dorsal tubular nerve cord, notochord and paired gill-slits are present.
- Marine and small forms. Cranium, jaws and paired appendages are absent.
- Solitary or colonial, fixed or free swimming with cuticular test containing tunicin.
- Free-swimming, pelagic, solitary or colonial forms. Muscles in the form of circular bands. Exhibits an alternation of generation.
- Muscle bands are always incomplete ventrally.

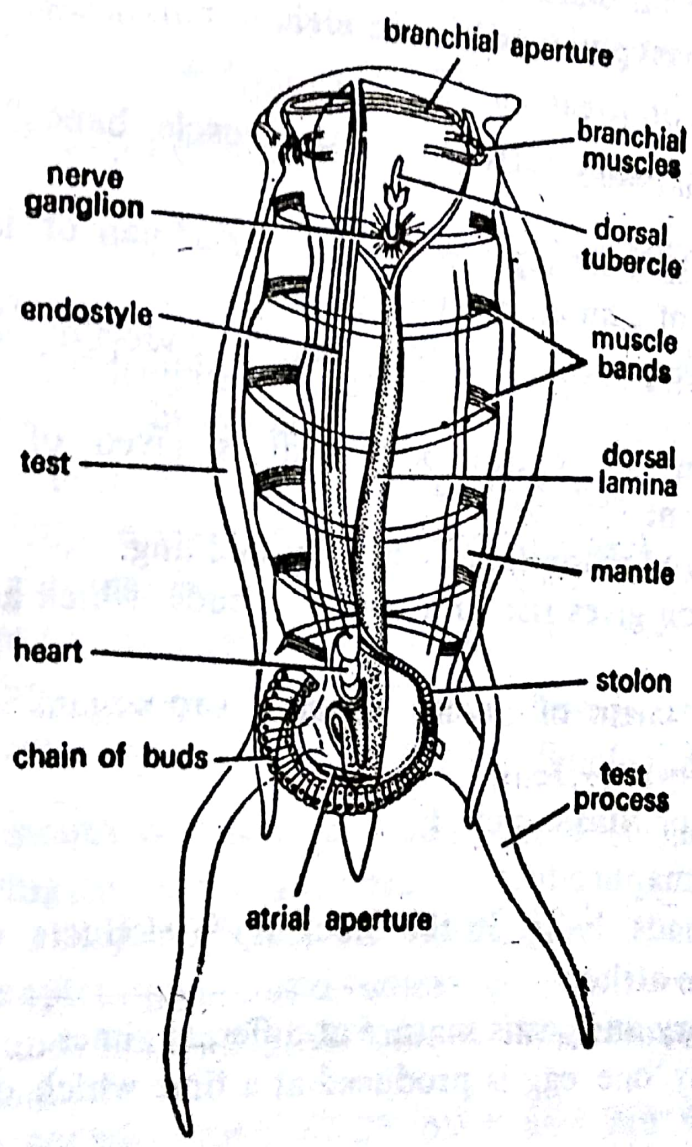


Fig. 70. *Salpa* (asexual phase).

**Characters :**

*Salpa* is a free swimming, solitary pelagic form.

**General organization :**

1. Body is barrel-shaped with mouth and atrial apertures at opposite ends.
2. Test is transparent.
3. Endostyle and pharyngeal bands are present.
4. Dorsal lamina is present and is known as gill.
5. A single tentacle is present on the dorsal surface.
6. Digestive system and the heart are present in a spot known as nucleus.

7. Near the nerve ganglion the eye is present.
8. Dorsal tubercle is present in front of the pharynx.
9. Subneural gland is present ventral to the ganglion.
10. *Salpa* is found in two forms, viz.,
  - (i) Asexual phase or oozoid.
  - (ii) Sexual phase or blastozoid.

**Asexual phase or Oozoid :**

1. Seven incomplete loop-like muscle bands surround the body.
2. Gill-slits are represented only by a pair of large apertures on either side of a single median gill-bar.
3. Nerve ganglion, sensory organ, endostyle and heart are present.
4. From the ventral body wall is given of an outgrowth known as stolon.
5. Reproduction takes place by budding.
6. Stolon gives rise to numerous buds which arise as a chain of zooids.
7. The chain of zooids develop sex organs and break off from the parent colony.

**Sexual phase or Blastozoid :**

1. Hermaphroditic.
2. Gonads lying in the nucleus, gonoducts opening separately into the atrium.
3. Ovary and testis mature at different times.
4. Only one egg is produced at a time which develops in the atrial cavity.
5. No tailed-larva in the development
6. Embryo develops into an asexual form and separates from the parent.

**Geographical distribution :** *Salpa* is generally found in all tropical seas.