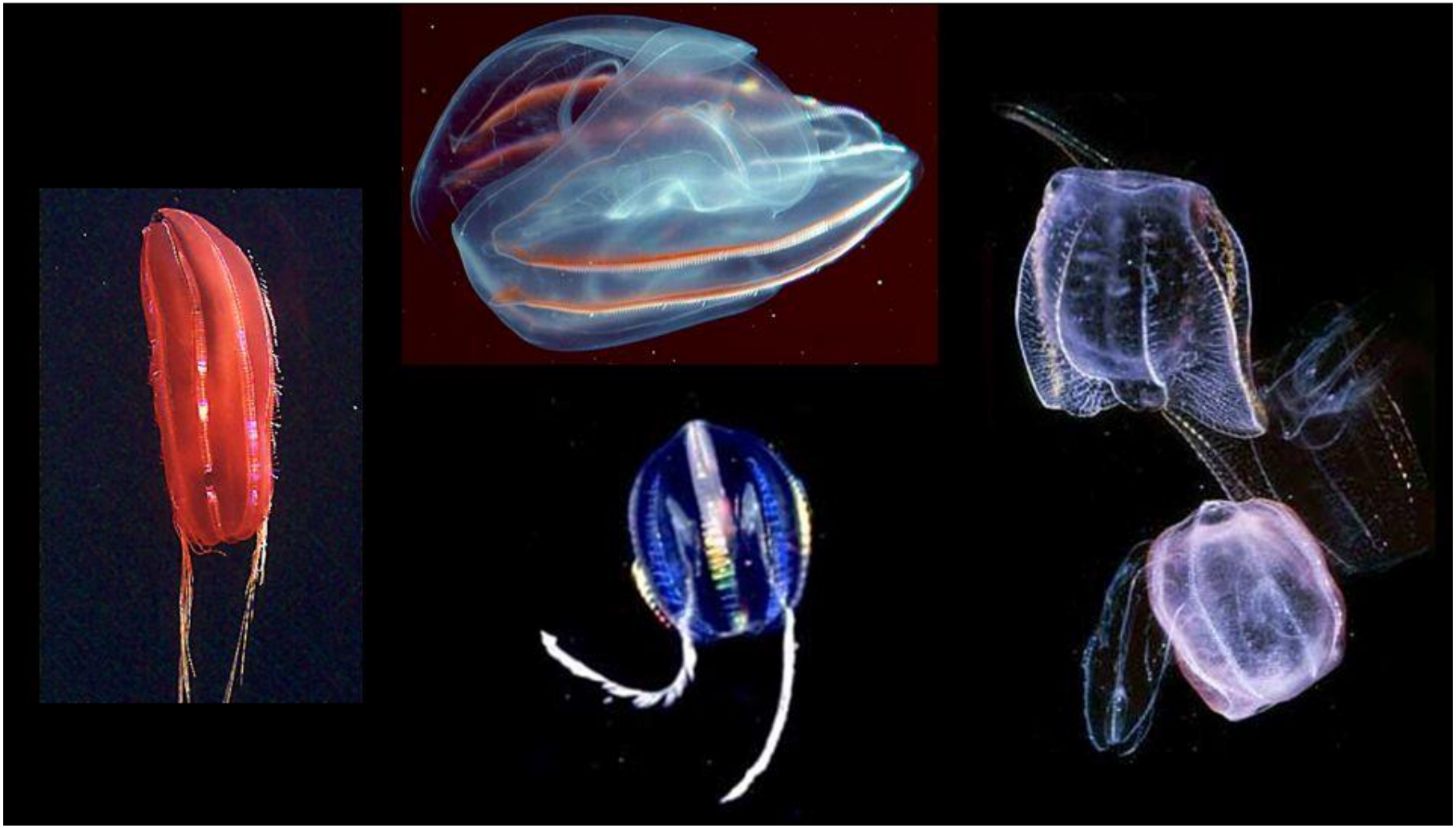
Ctenophores

General characteristics of Ctenophores

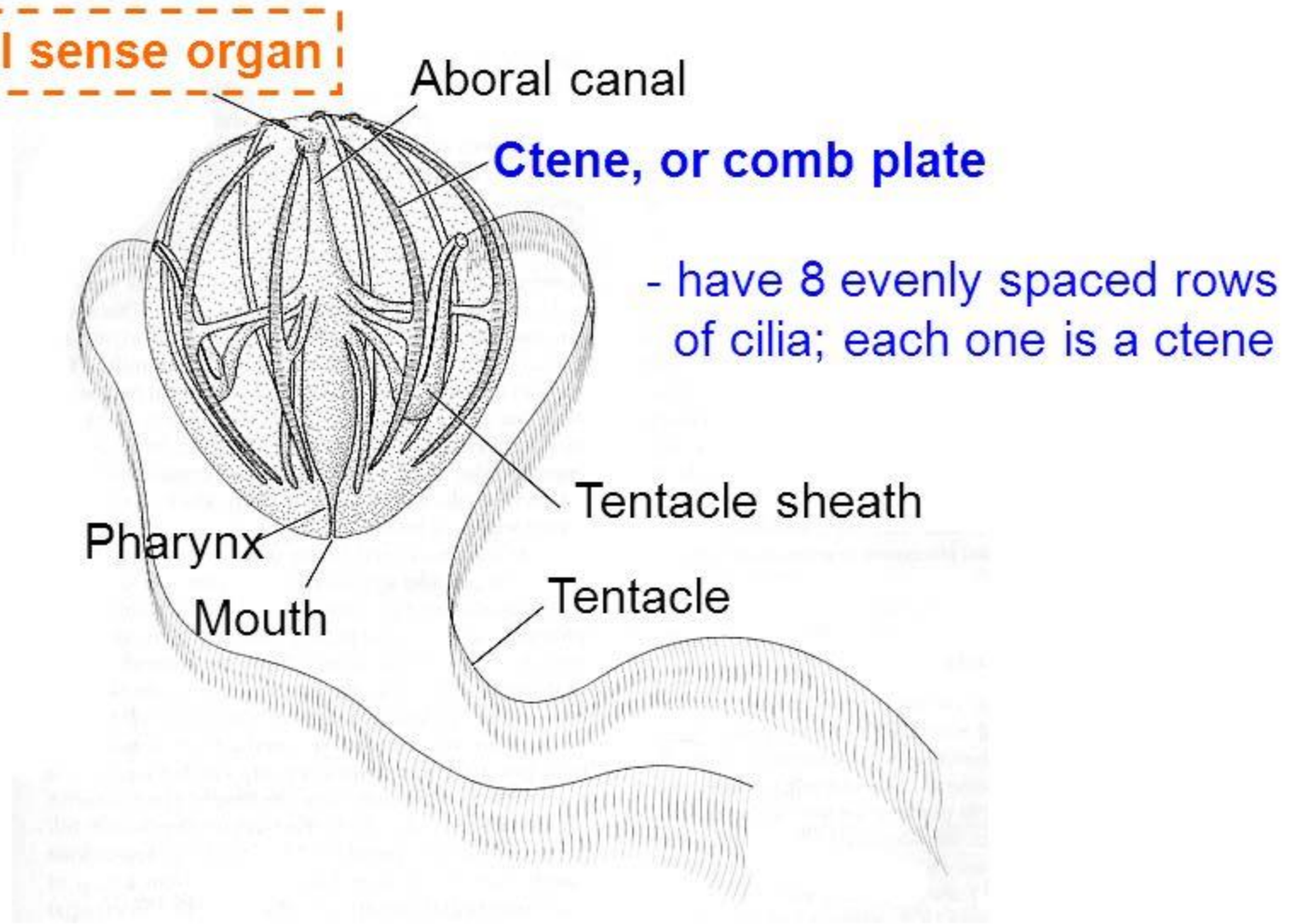
- They are free-swimming, marine, solitary, pelagic animals.
- The body is transparent, gelatinous, pear-shaped
- Triploblastic, acoelomate animals
- Biradially symmetrical body
- Tissue grade of organization
- Their digestive system contains the mouth, stomodaeum, complex gastrovascular canals, and 2 aboral anal pores.
- They lack nematocysts.
- They have special adhesive and sensory cell i.e. colloblasts or lasso cells present in tentacles which helps in food captures.
- They lack skeletal, circulatory, respiratory, and excretory organs.
- Nervous system is diffused type having statocysts
- They are monoecious
- Their development indirect with characteristic cydippid larva.

Most ctenophores are pelagic predators

Ecologically, can be the dominant predators in the plankton



Ctenophore body plan

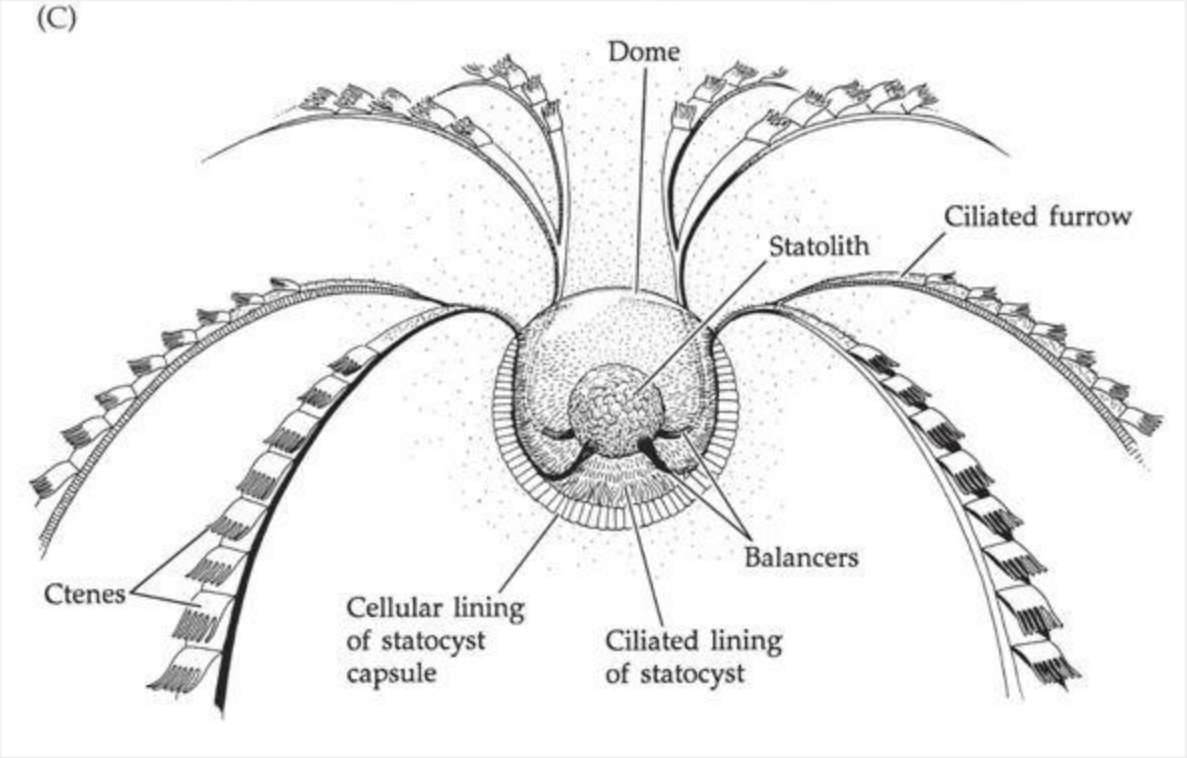


Apical sense organ: functioning

- Statocyst pushes against balancers →
- Beating of cilia in furrow → Beating of 1st comb
- Combs transmit waves mechanically

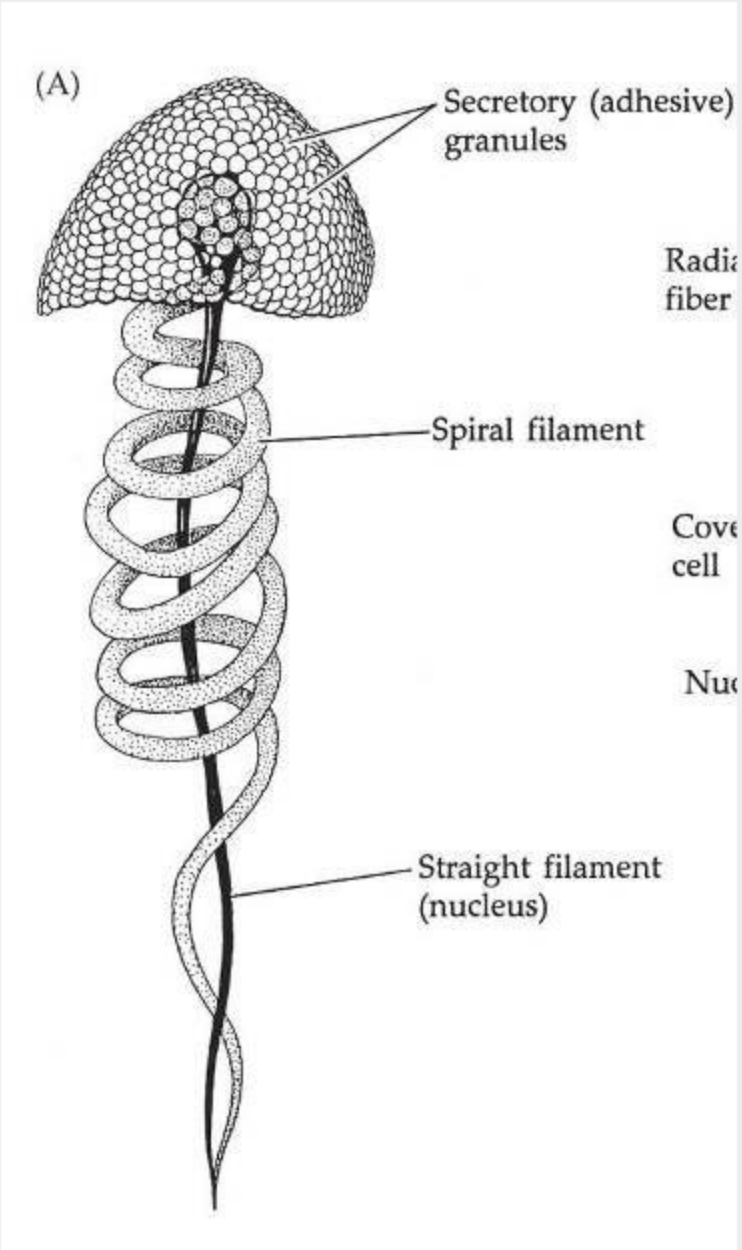
  ★ How do we know this?

- Tilting → More vigorous beating in lower rows



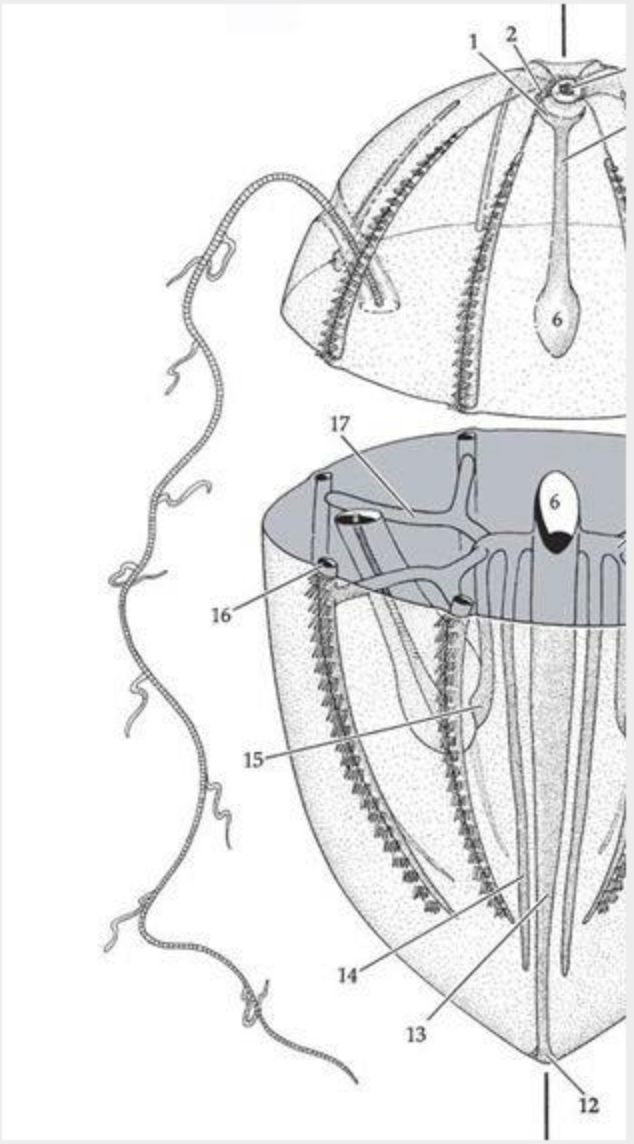
Feeding (focus on *Pleurobrachia*)

- **Focus: Colloblasts**
  - ★ **On tentacles**
  - ★ **Near/on mouth**
  - ★ **Anchored in muscle**
  - ★ **Structure**
    - Straight filament
    - Spiral filament
    - Head with adhesive granules
    - Associated neuron
  - ★ **Granules replaced**



Feeding (focus on *Pleurobrachia*)

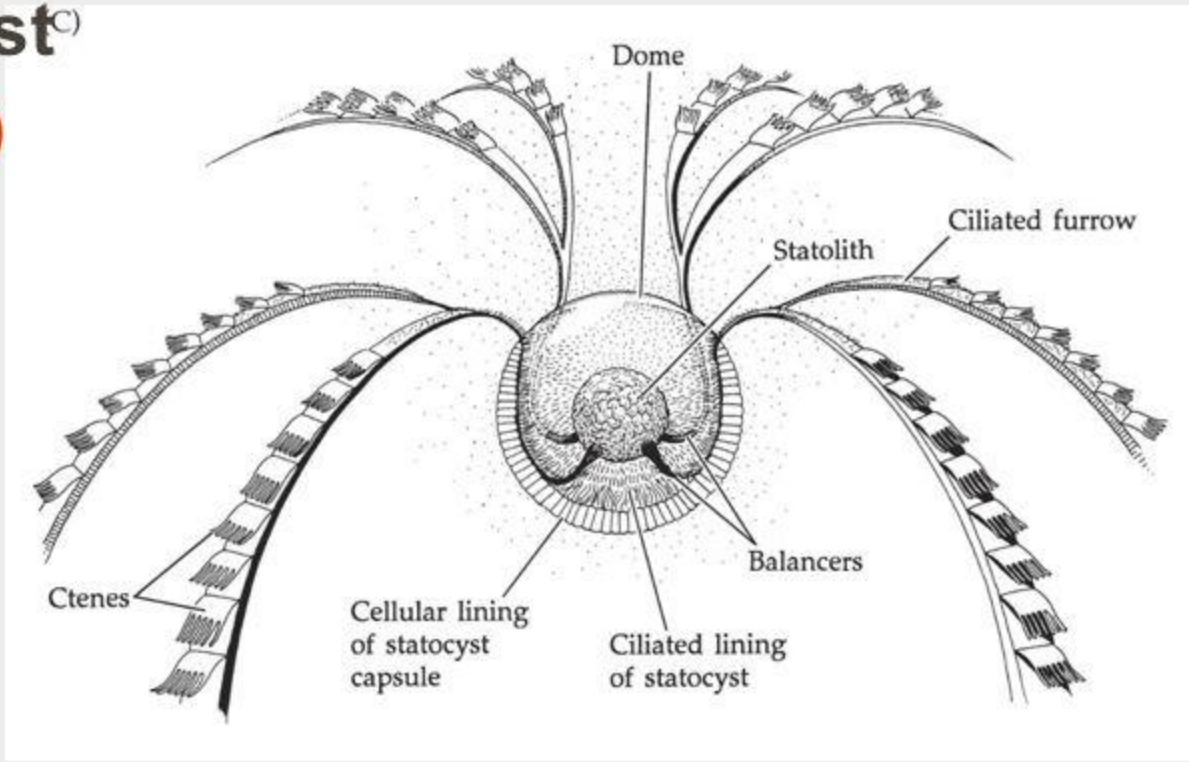
- Predatory!
- Tentacles
  - ★ Extend up to 100X their body length
  - ★ Retract into sheaths
  - ★ Food sticks to them, and then they wipe them off in their mouth
    - What causes food to stick?



Nervous system/movement

- Control of comb rows: **apical sense organ**

- Modified Statocyst[C)]
  - ★ Dome (from cilia)
  - ★ Statolith
  - ★ Balancers
  - ★ Ciliated furrows
    - One per comb row



Affinities of Ctenophores

1. Affinities with Cnidaria:

1.Having a strong biradial symmetry and an oral-aboral axis.
2. Diploblastic body.
3. Medusa like body with a gelatinous mesenchymal mesogloea.
4. Absence of coelom.
5. Similar but more advanced endodermal gastrovascular cavity.
6. Diffused epidermal nerve plexus.
7. Presence of statocyst.
8. Absence of nephridia.
9. Absence of respiratory organs.
10. Endodermal gonads.

Affinities of Ctenophores

Differences from Cnidaria:

1. Presence of combplates.
2. No tentacles around mouth.
3. Presence of colloblasts.
4. An aboral sense organ.
5. Mesenchymal muscles.
6. Definite organization of digestive system.
7. Presence of anal pores.
8. Determinate cleavage.
9. Absence of a planula larva.
10. Presence of cydippid larva.
11. Complete absence of polymorphism.
12. Absence of alternation of generation and asexual reproduction.

2. Affinities with Platyhelminthes:

1. Dorsoventrally flattened body.

2. Crawling mode of locomotion.

3. Ciliated epidermis.

4. Lobed gastrovascular cavity.