Type study – Herdmania

Phy → Chordata
Subph. → Urochordata → Tunicata
Class → Ascidiacea
Order → Stolidobranchia
Genus → Herdmania (sea squirts)

Notochord & Nervechord to the tail of their Tadpole larvae
marine, sedentary, Hermaphrodite
It shows commensal to the shell of a living gastropod mollusca
↓
It carries Herdmania from place to place & provide food.

Teacher's Signature : _____

is covered by the
arts : body proper and foot.

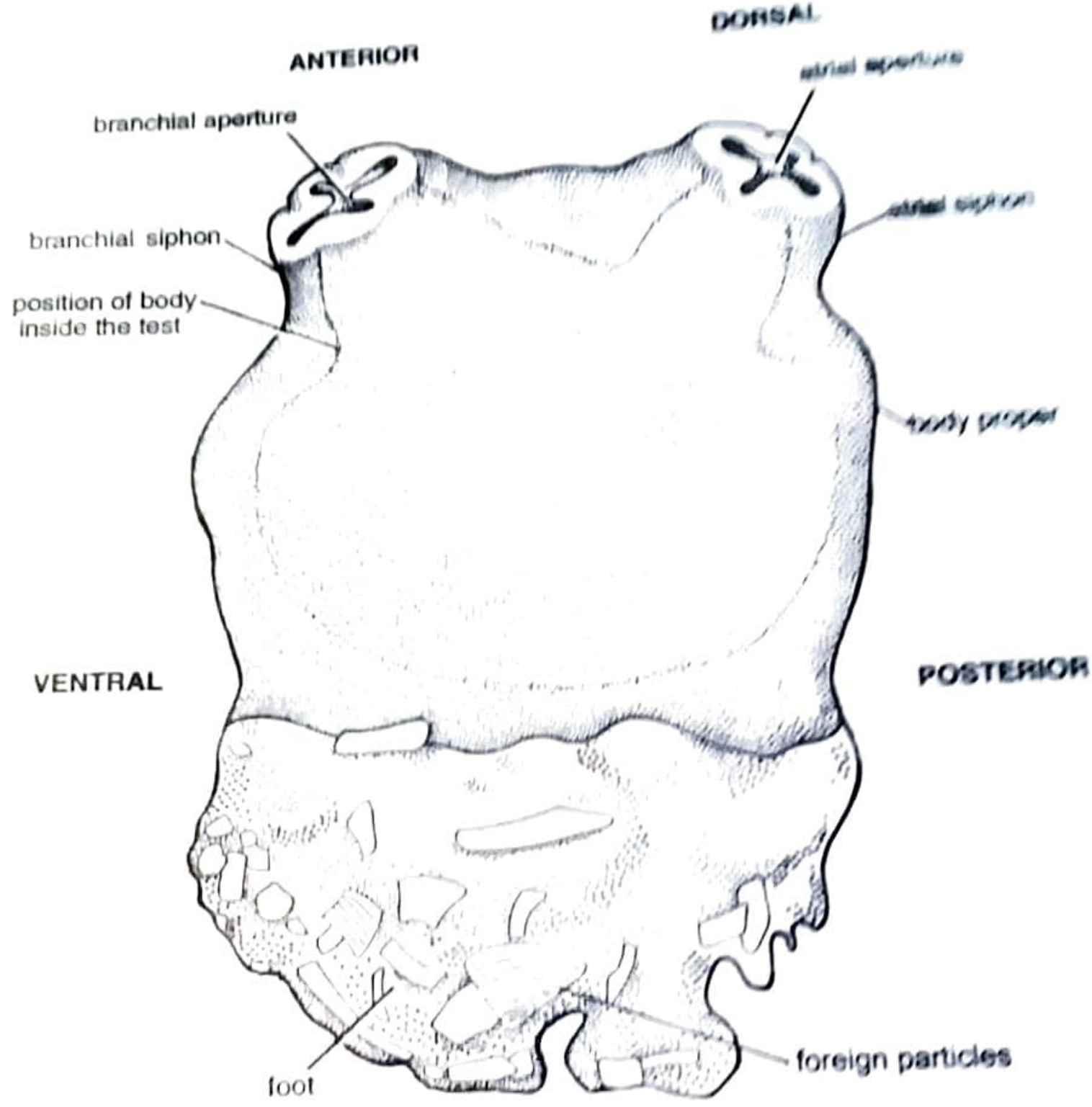

Fig. 1. *Herdmania*. External features in left view.

External morphology :

→ Body ÷ into 2 parts

① Body proper ② Foot

Diagram

① Body proper : → Distal free part

→ Broad & longer then foot

→ Free end of the body proper is drawn into 2 projection → branchial siphon
→ Atrial siphon

→ ① Branchial siphon bears branchial aperture (मुख) (mouth)
[incurrent opening]

BA

→ ② Atrial siphon bears atrial aperture (cloaca)

AA

[excurrent opening]

Date

Date

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② foot → → Made up of tunic
→ rough due to sand particles, shell pieces & other foreign bodies

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Test

→ Protective jacket
→ accessory respiratory organ & receptor organ
→ transparent in young stage
→ made up of ⇒ ① gelatinous matrix
② Corpuscles (various types)
③ Interlacing fibrils
④ Blood vessels
⑤ Calcareous spicules

① matrix → Made up of polysaccharide called tunicin

② Corpuscles :-

Teacher's Signature :

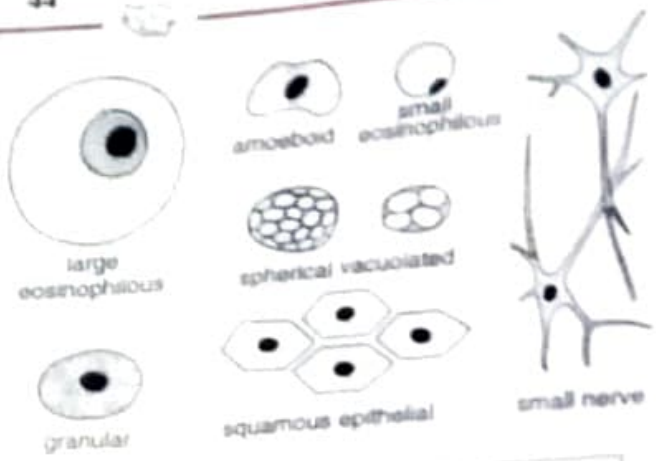

Fig. 3. *Herdmania*. Different types of cells found in test.

(B) Corpuscles

The cells found in matrix are mesodermal in origin and are of 6 or 7 different types (i) large eosinophilous cells are spherical in shape and fewer in number. These cells stain bright red with eosin. (ii) small amoeboid cells are small cells, amoeboid in nature, without any constant shape. (iii) small eosinophilous cells possess an eccentric nucleus and are more numerous. (iv) spherical vacuolated cells are small in size, possessing vacuoles and nucleus is invisible. (v) granular receptor cells are probably sensory in function. These cells are less abundant and are surrounded by nerve fibers. (vi) small branched nerve cells are small and possess two to six long processes (dendrites). These cells are more numerous than the receptor cells. Nerve cells are supposed to play an important role in communication of the stimuli from the receptor cells to the other parts of the test. According to Das (1936), the sensitiveness of *Herdmania* is due to the presence of nerve cells in the test, and (vii) squamous epithelial cells (Fig. 3).

(C) Interlacing Fibrils

These from a fine network in the test. Some of them are like smooth muscle fibres, while others resemble nerve fibres.

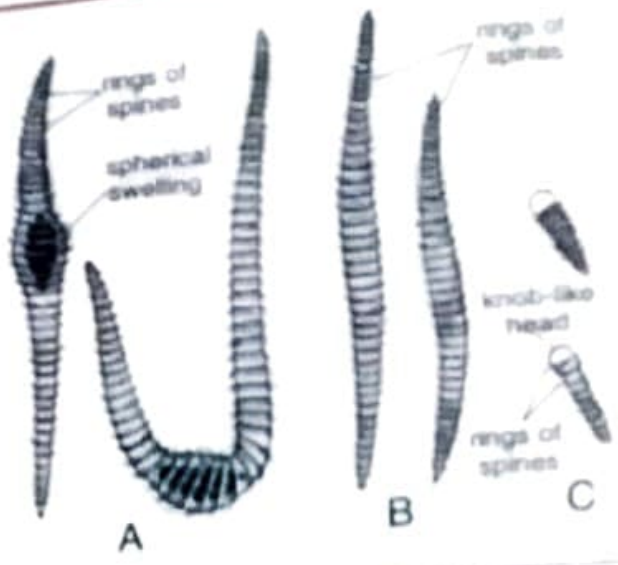

Fig. 4. *Herdmania*. Types of spicules. **A.** Pipette-shaped megascleres. **B.** Spindle-shaped megascleres. **C.** Microscleres.

(D) Blood Vessels

These form an anastomosing system in the test. Numerous branches near the surface form oval or pear-shaped terminal knobs or ampullae responsible for red patches visible on the surface of test. The ampullae serve as accessory respiratory as well as receptor organs, being connected to nerve cells.

(E) Spicules

Herdmania has large numbers of calcareous spicules of two types. All the spicules bear several equi-distant rings of minute spines all pointing in the same direction all along their length (Fig. 4).

1. Megascleres. The large sized megascleres occur in all the parts of body except the heart. They are again of two varieties. (i) Pipette-shaped megascleres reach upto 3.5 mm in length. They may be straight or curved with pointed ends. Each has a large spherical swelling in the middle acquiring the characteristic pipette-like appearance. (ii) Spindle-shaped megascleres are only 1.5 to 2.5 mm long, more abundant and usually present in bundles. Equipped with 20-60 equally spaced rings of spines.

2. **Microscleres.** These are very small in size, only 40 to 80 μ long, and confined to the test only. Each resembles a paper pin having a rounded knob-like **head** and a tapering **body**. The body is beset with 5-20 equidistant rings of spines.

The spicules provide an internal rigid supporting framework like endoskeleton*, keep the mantle firmly fixed to the test, stiffen the walls of blood vessels to avoid their collapse, and ward off the predators.

MANTLE OR BODYWALL

Beneath the test lies the **bodywall** or **mantle** which is visible on removal of the test which it secretes. The mantle is suspended inside the test and attached only at the branchial and atrial apertures forming the corresponding siphons. It is not developed uniformly throughout the body, being thick, highly muscular and opaque on the antero-dorsal side but thin, transparent and almost without muscles on the postero-ventral side where the internal organs (viscera) are quite visible through it. Mantle encloses a large water-filled cavity, the **atrium**.

Histologically, the mantle is composed of three cellular layers : outer epidermis, middle mesenchyme and inner epidermis.

(A) Outer Epidermis

The outer epidermis is made of single layer of flat, hexagonal cells. At the branchial and atrial apertures it is inturned to reach up to the base of the siphons and forming stomodaeum and proctodaeum, respectively. The outer epidermis secretes the test.

(B) Mesenchyme

It lies below the outer epidermis and is derived from mesoderm. It consists of connective tissue