

Torsion in Mollusca

Torsion is defined as the rotation of the visceral organs to an angle of 180° in the anticlockwise direction. It occurs in the larva of gastropods. It converts the symmetrical larva into an asymmetrical adult. Torsion occurs in majority of gastropods the gastropods exhibiting torsion are included in the group streptoeura. eg Pila.

Process of Torsion

The larva of gastropod is symmetrical. The symmetrical larva has the following features -

1. The alimentary canal is straight with the mouth at the anterior end and the anus at the posterior end.
2. The mantle cavity is located on the posterior side.
3. The ctenidia are located posteriorly
4. The nervous system is bilaterally symmetrical.
5. The auricles lie posterior to the ventricle.

The larva develops torsion in order to become the adult.

Fig: - Torsion

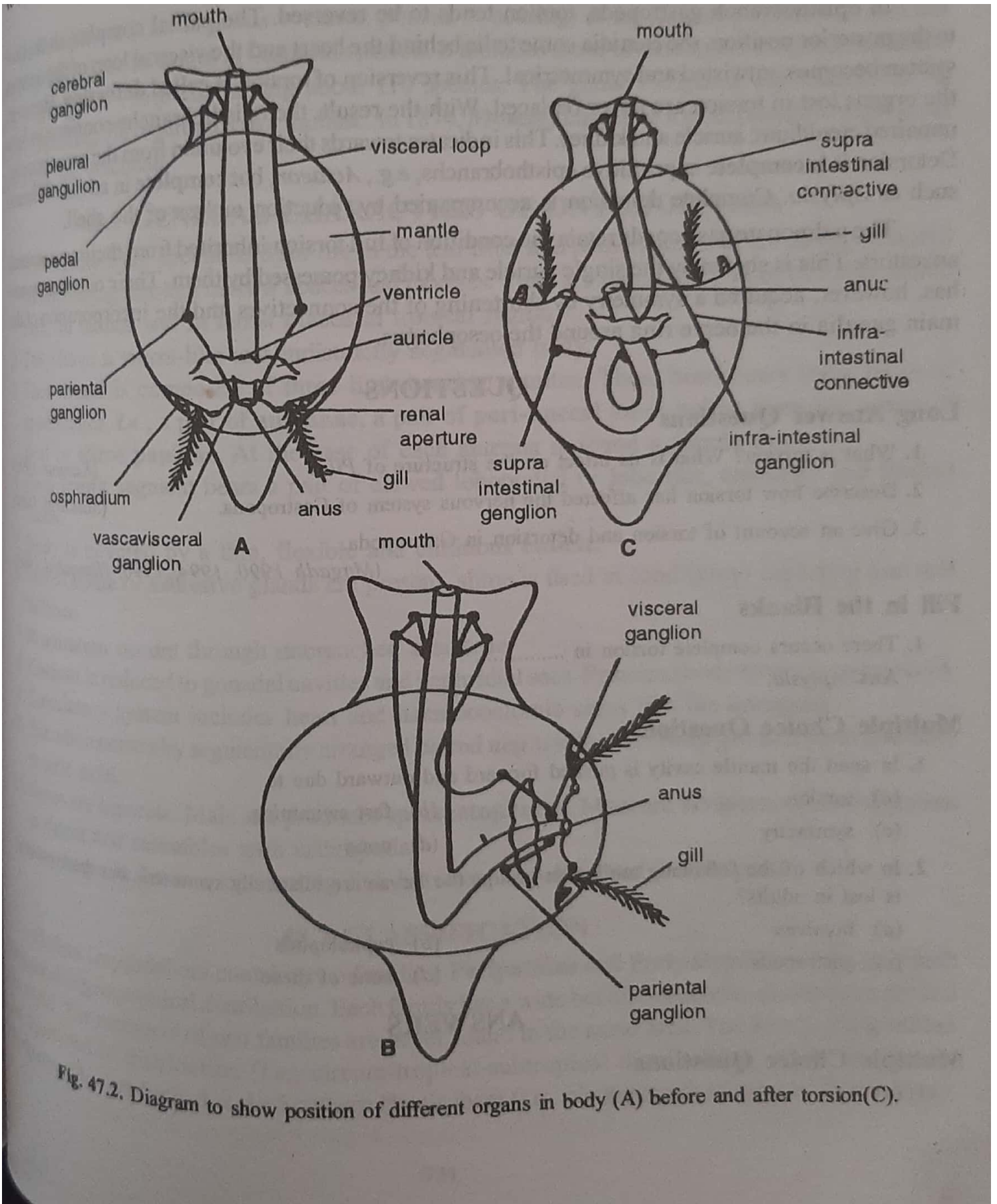


Fig. 47.2. Diagram to show position of different organs in body (A) before and after torsion(C).

3. Anticlockwise rotation → The mantle and the pallial complex rotate to an angle of 180° in the anticlockwise direction. This process shifts the organs from the left side to the right side.

Events in Torsion

Torsion produces the following changes:-

1) Looping of Alimentary canal - the alimentary canal becomes loop like. the anus is brought forward near the mouth.

2) Twisting of Nervous system - the pleuro visceral connectives becomes twisted in a figure of 8. This phenomenon is called chiastoneury.

3) Displacement of Mantle cavity - The mantle cavity is shifted forward.

4) change in the position of ctenidia - the ctenidia are brought and directed forward.

5) Displacement of Auricles - the auricles are shifted to the front of ventricle.

6) Coiling of shell and visceral mass - the shell and the visceral mass are coiled.

7) Degeneration of structure on the left side - the organs located on the

left side of the larva degenerate.
3) Loss of Symmetry — the bilateral-symmetry of the larva is lost as a result of torsion.

Detorsion

In some gastropods, after torsion, there is a reversion of torsion. The reversion of torsion is called detorsion. During detorsion the visceral mass shifts to an angle of 180° in the clock wise direction. The mantle cavity is brought forward the alimentary canal is untwisted the anus is brought back ward. Detorsion occurs in Euthyneura. Eg: - Aplysia.

Advantages of Torsion

Torsion provides the following advantages to the animals.

1.) Respiration — Before torsion the gills and anus are situated posteriorly. As the animals move forward, the faecal matter is released behind. Hence the water becomes turbid and impure. This impure water is inhaled into the mantle cavity for respiration. But after torsion the gills are brought forward. Hence the respiratory water is taken in from a head of the animal. Hence by torsion

the animal gets the privilege of using fresh water for respiration.

2) Locomotion — Before torsion the respiratory water is taken in from behind the animal. Hence this water current moves forward inside the animal. When the animal moves forward, it has to push the water - backwardly. So before so before torsion the respiratory current and locomotory current oppose each other. This creates difficulty to locomotion. After torsion the gills are placed forwards and hence the respiratory water is taken from ahead. So the respiratory current coincides with the locomotory current. This does not produce any hindrance to locomotion.

3) Sensation — Before torsion the osphradium is situated backward. But after torsion the osphradium is brought forward. This anteriorly placed osphradium helps the animal to test the suitability of the water lying ahead.

4) Protection — Before torsion the foot is withdrawn into the body first. Only after the foot is drawn in the more sensitive parts like the head and tentacles are taken in. But after torsion the head and tentacles

are withdrawn first. Only lastly the foot is withdrawn. This gives protection from enemies.

Disadvantages

Torsion produces the following disadvantages

1) Sanitation - Torsion brings the anus close to the mouth. The faeces released from the anus gives rise to sanitation problem.

2) Respiration - The faecal matter is released forward it makes the water lying ahead impure. The same impure water is inhaled for respiration.
