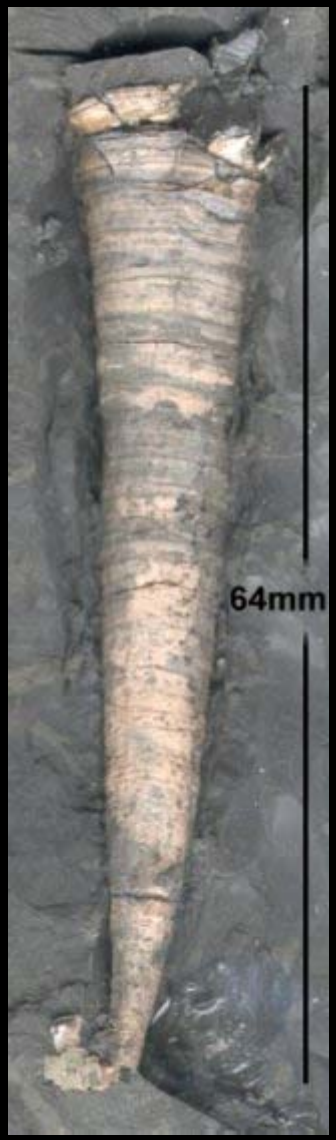
Ph. Mollusca
(7 classes)



Cl. Scaphopoda

Cl. Aplacophora

Cl. Monoplacophora

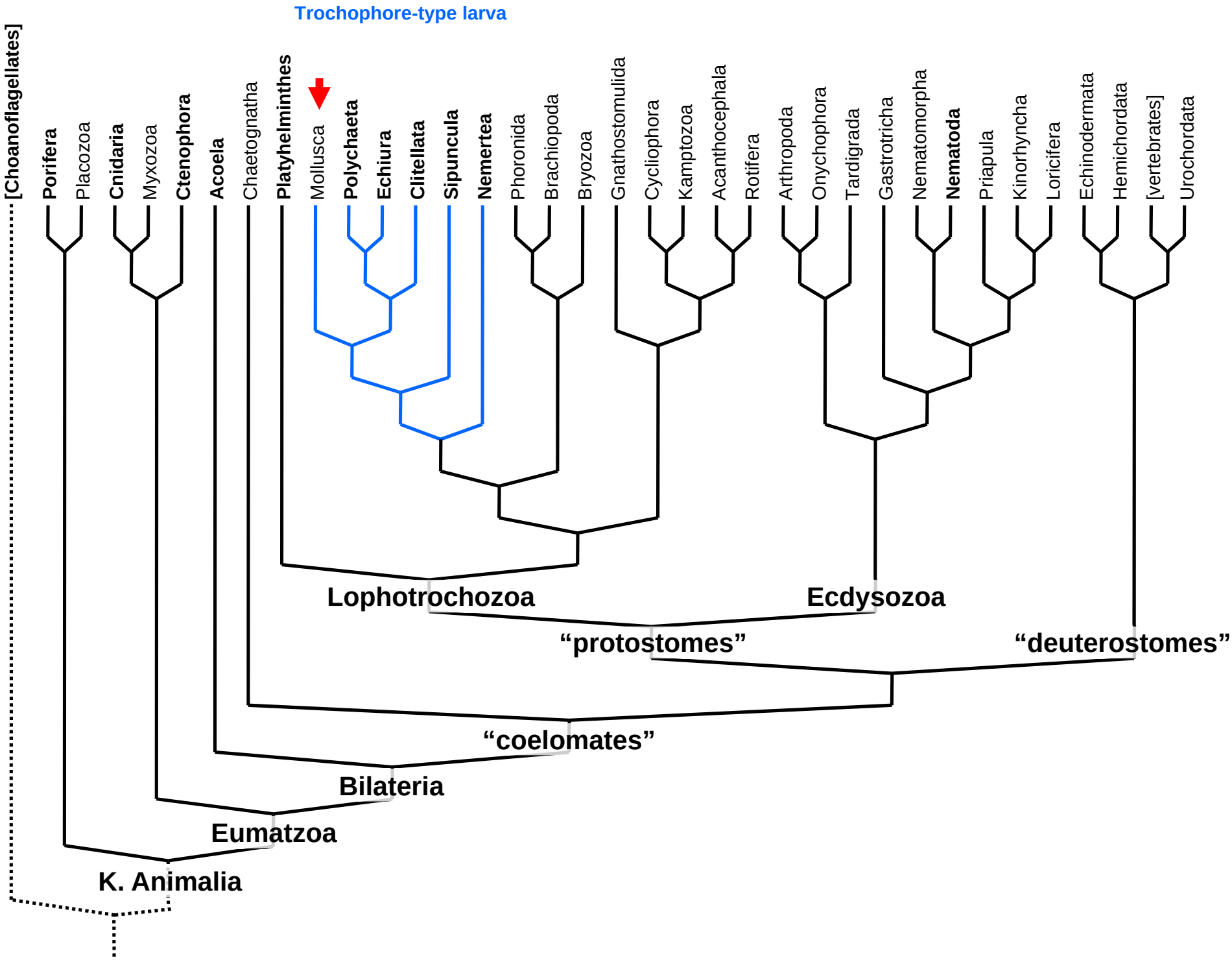
Cl. Polyplacophora

Cl. Bivalvia

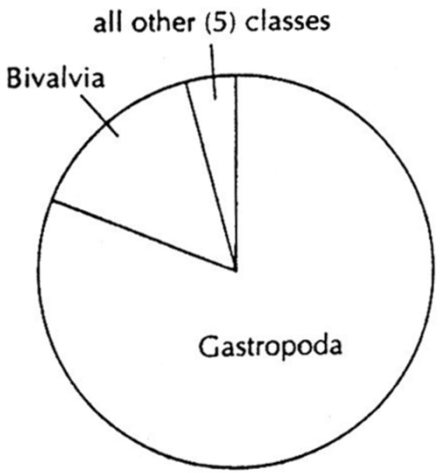
Cl. Gastropoda

Cl. Cephalopoda

***Theme*: class level body plans**

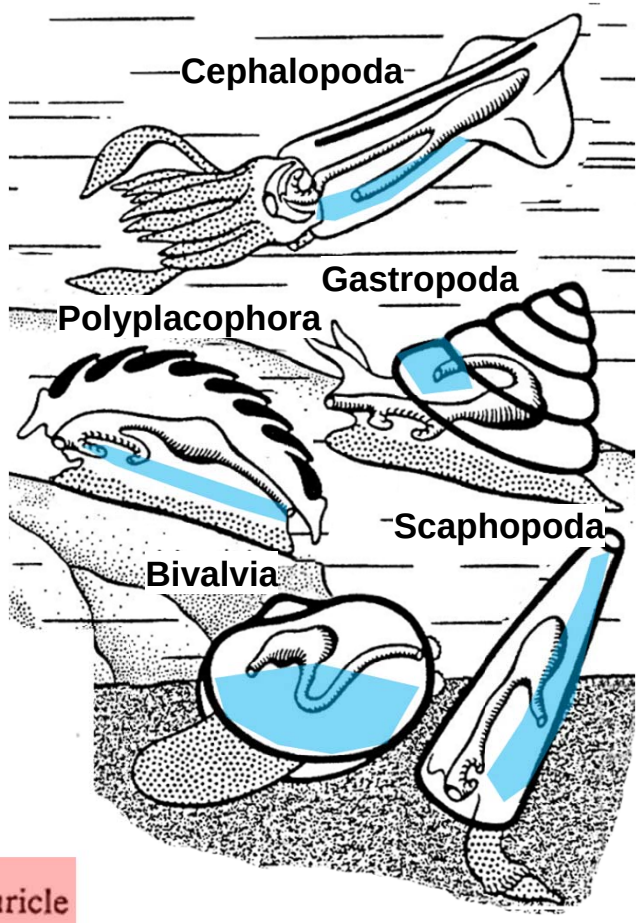

Trochophore-type larva
[Choanoflagellates]
Porifera
Placozoa
Cnidaria
Myxozoa
Ctenophora
Acoela
Chaetognatha
Platyhelminthes
Mollusca
Polychaeta
Echiura
Clitellata
Sipuncula
Nemertea
Phoronida
Brachiopoda
Bryozoa
Gnathostomulida
Cycliophora
Kamptozoa
Acanthocephala
Rotifera
Arthropoda
Onychophora
Tardigrada
Gastrotricha
Nematomorpha
Nematoda
Priapula
Kinorhyncha
Loricifera
Echinodermata
Hemichordata
[vertebrates]
Urochordata
Lophotrochozoa
Ecdysozoa
“protostomes”
“deuterostomes”
“coelomates”
Bilateria
Eumatzoa
K. Animalia

Ph. Mollusca

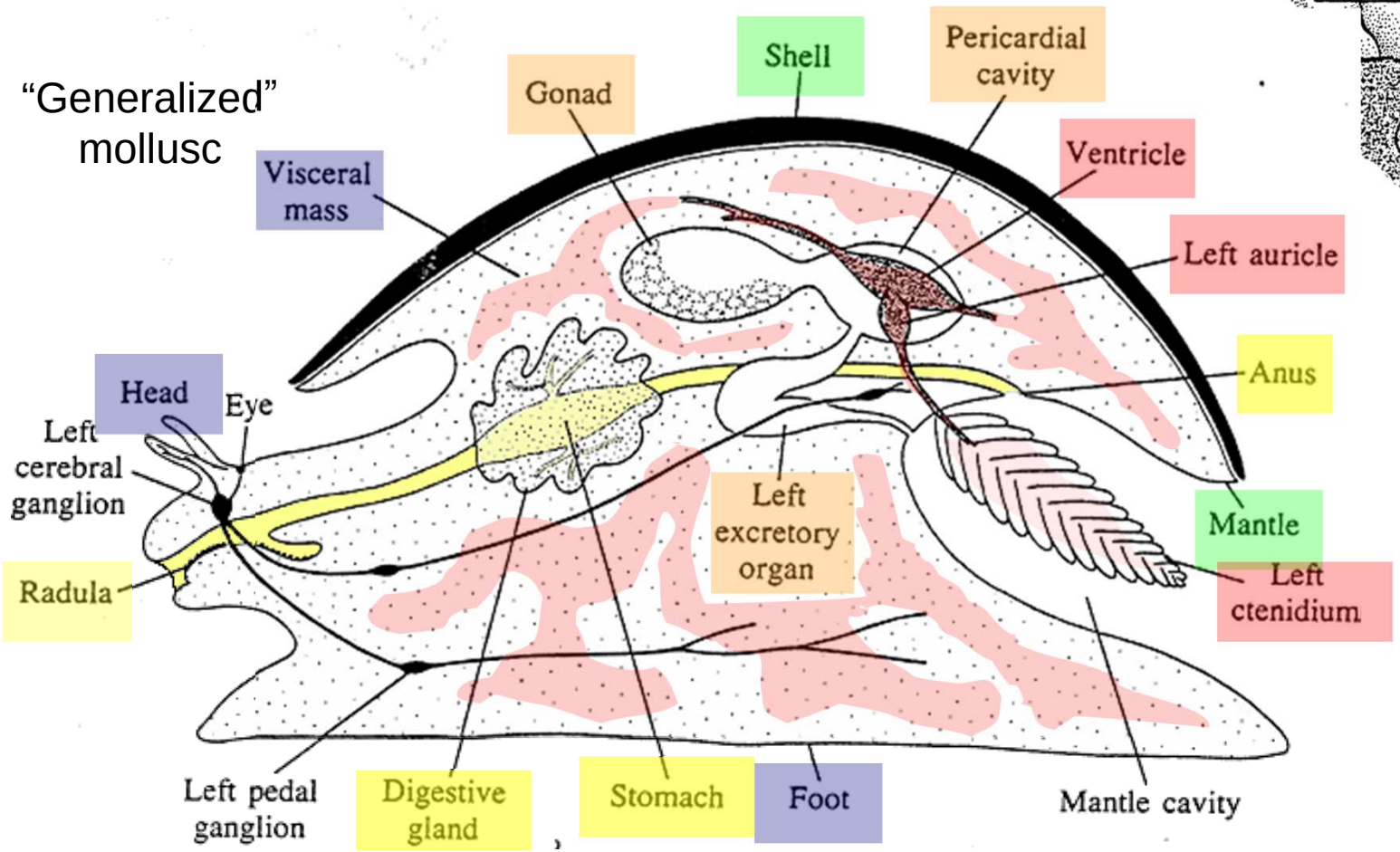


The molluscan body plan has been modified in the various groups. In this diagram, the digestive tract is shaded, the foot is stippled, and the shell is marked by a heavy black line. The squid is most readily compared to the other molluscs when oriented with the head and foot down.

- digestive tract
- foot
- shell
- mantle cavity

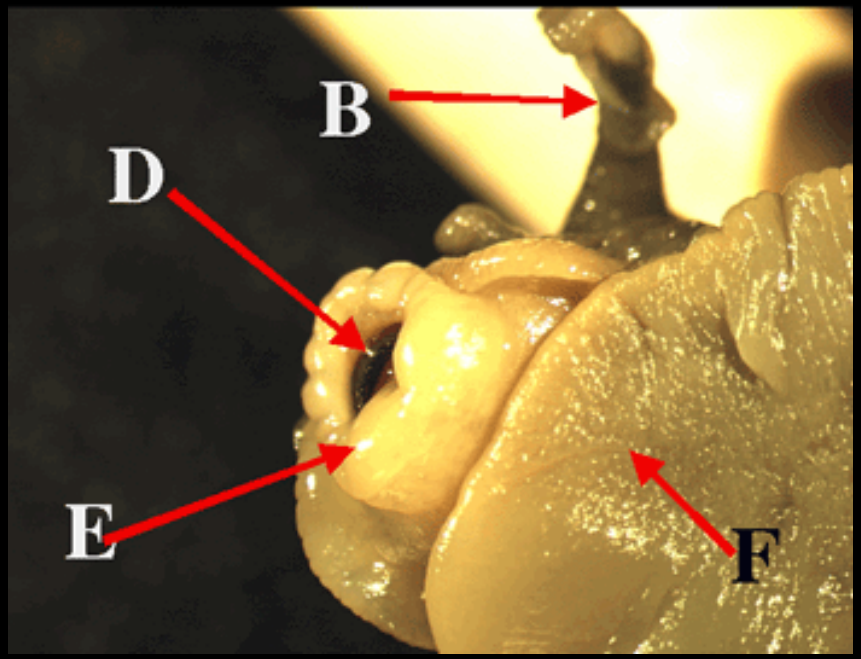


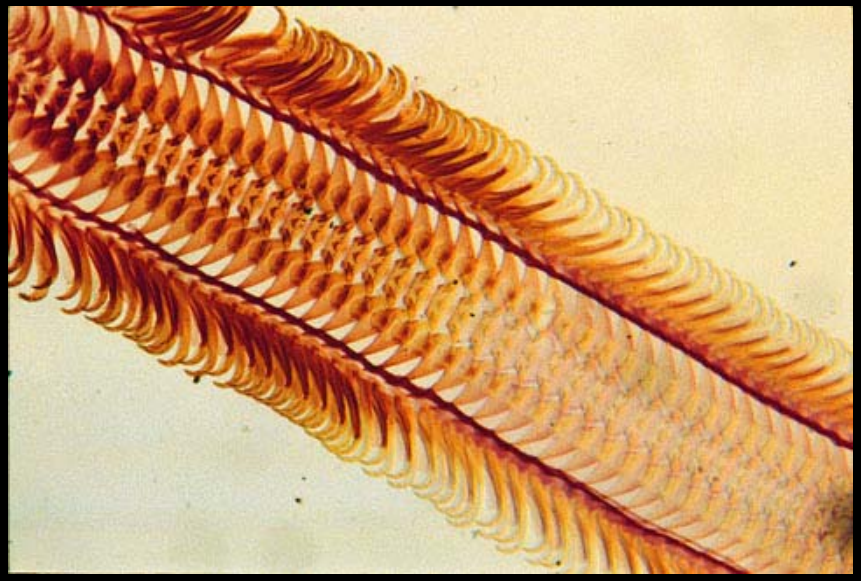
"Generalized" mollusc

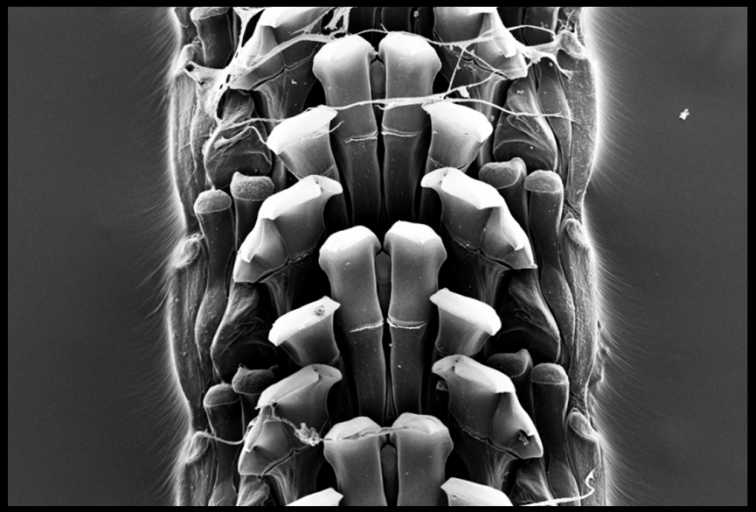


Radular teeth can vary with diet

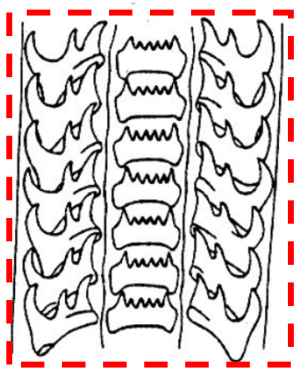
(within and between species)

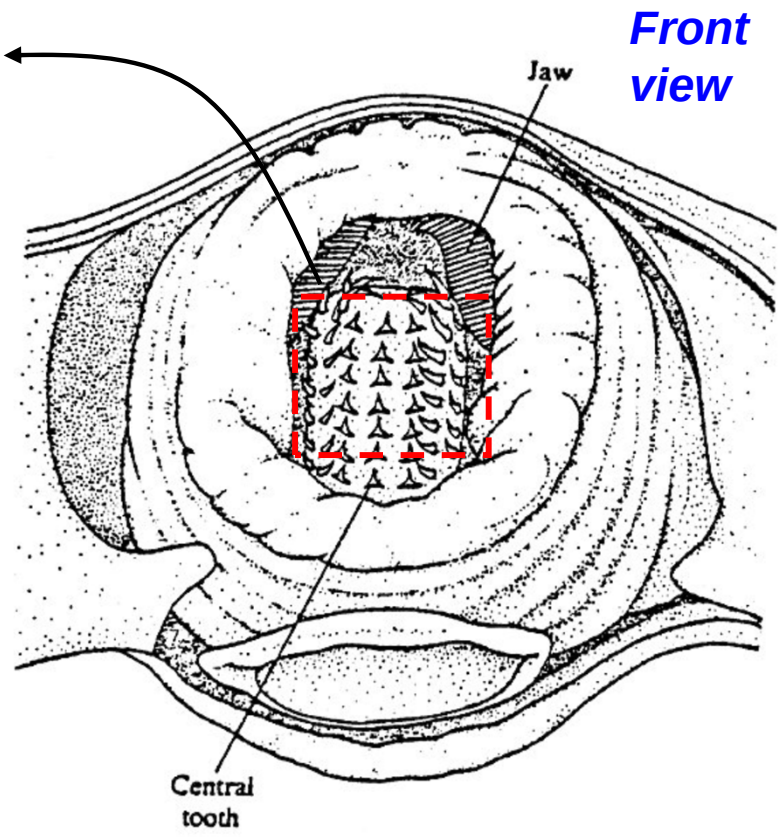


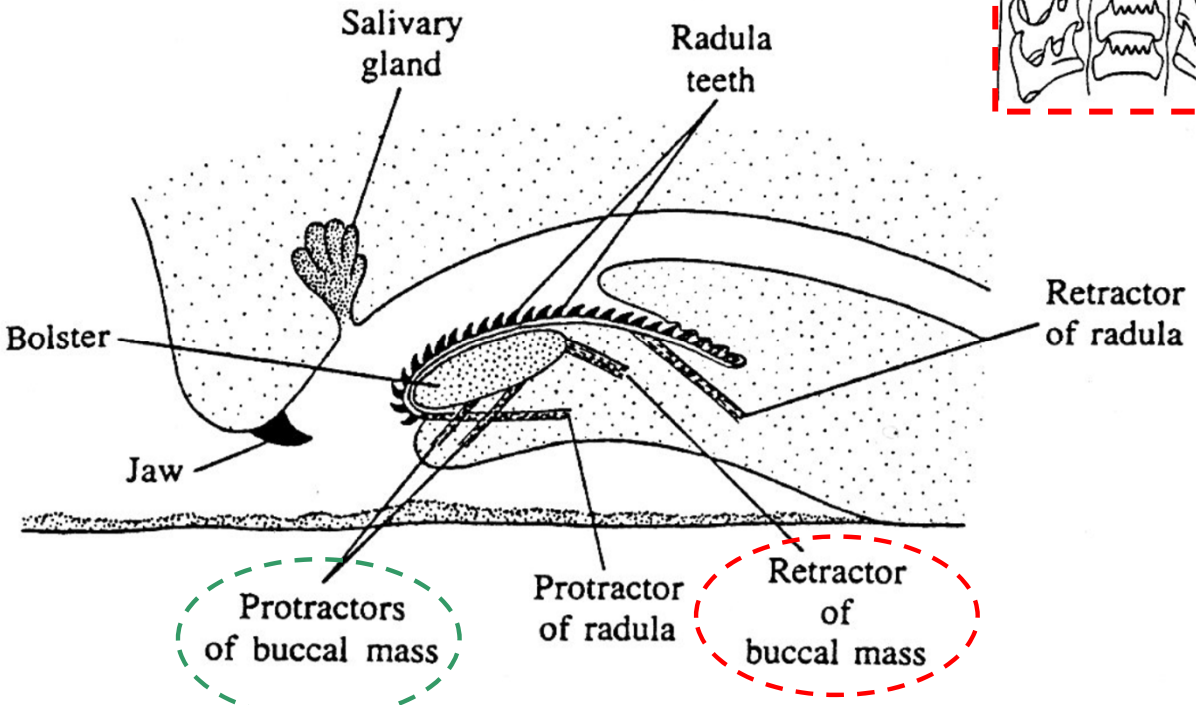


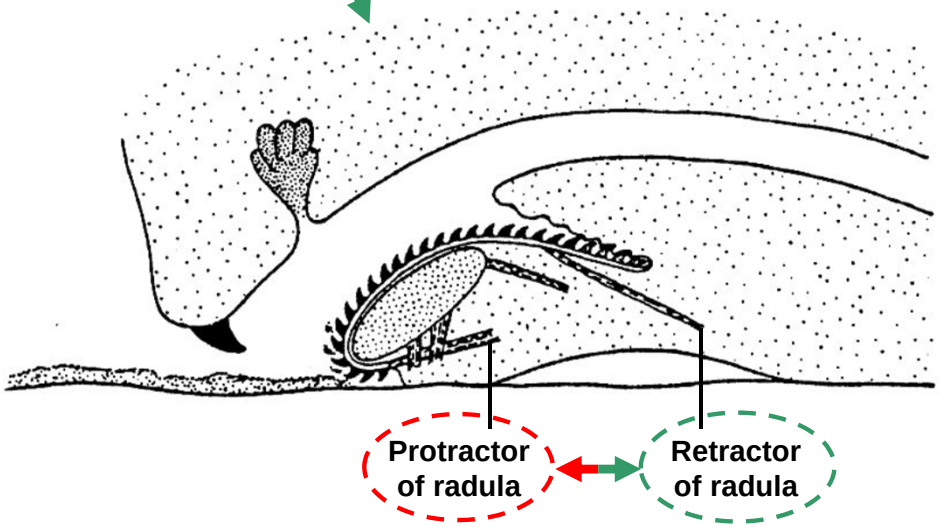


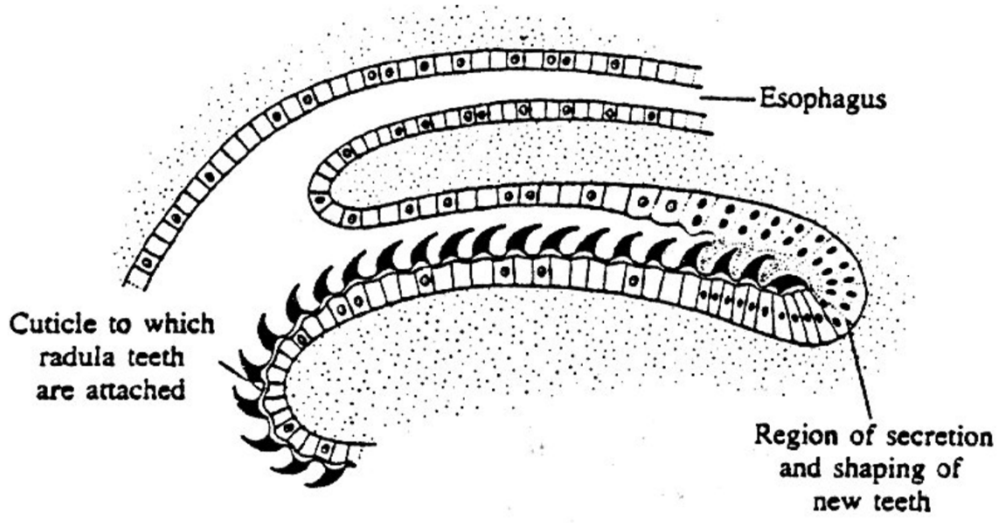
The molluscan radula







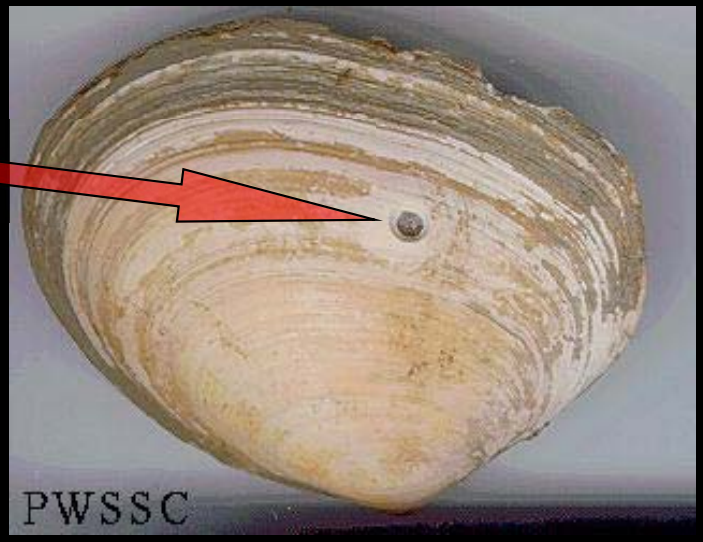




pattern left by a land snail's radula scraping algae from greenhouse glass

Predatory prosobranchs

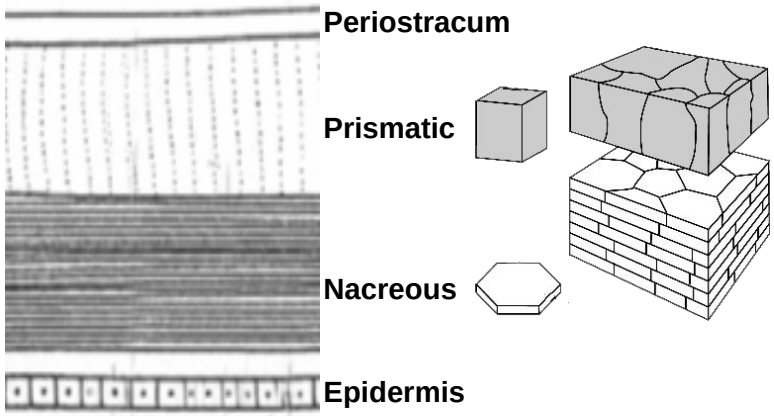
moon snail (mesogastropod)



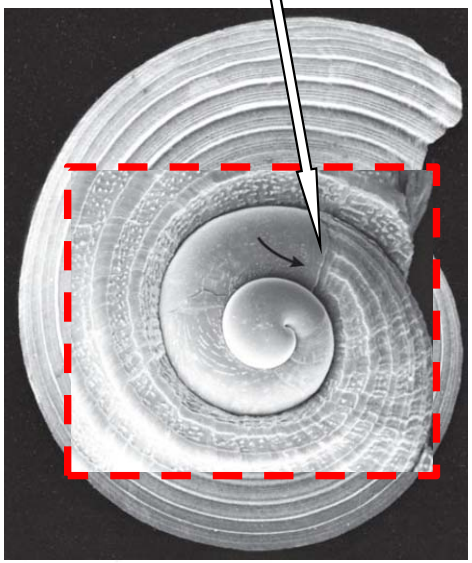
whelk (neogastropod)

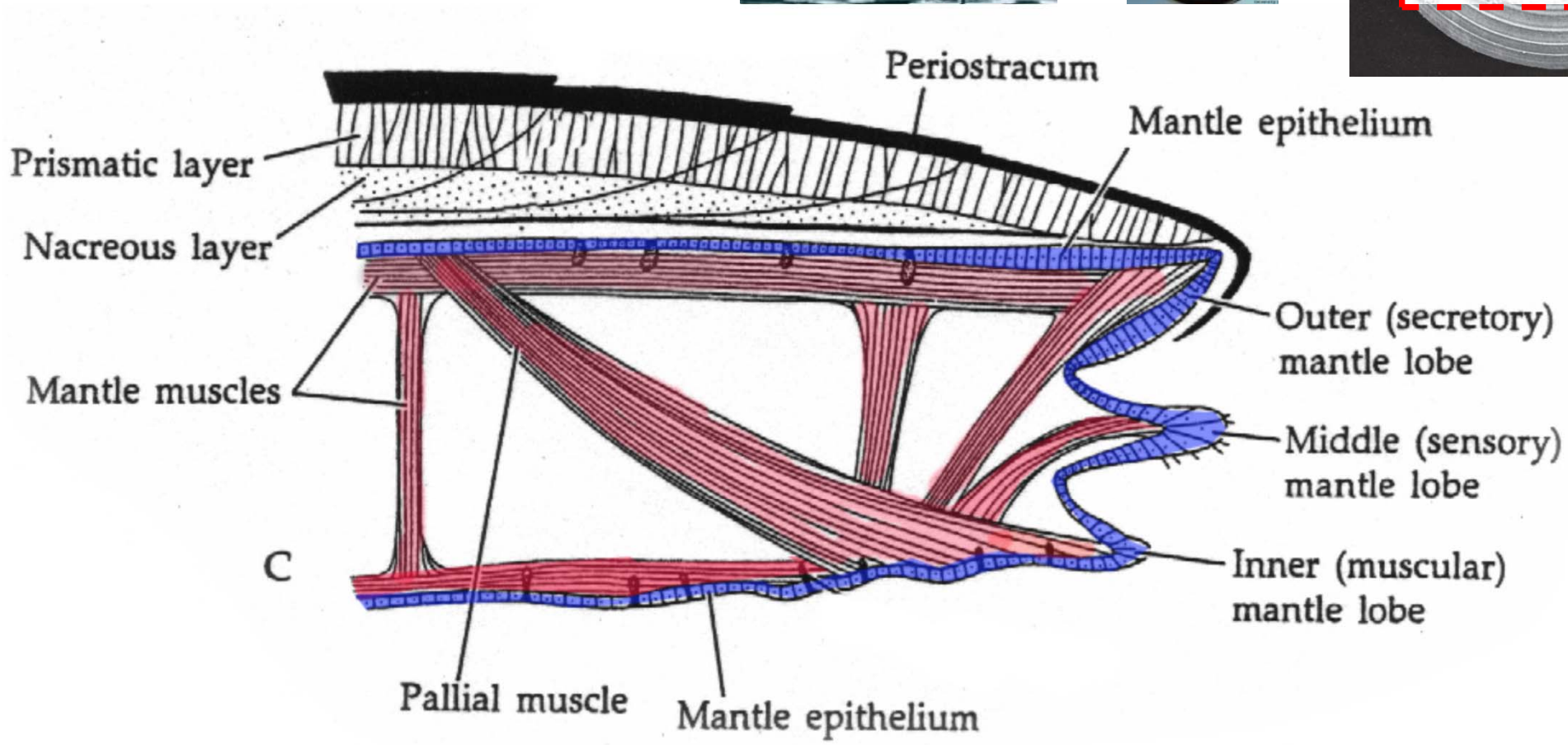
The molluscan shell

$CaCO_3$ and conchiolin



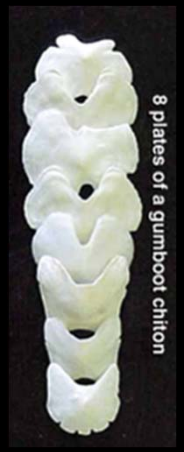
larval-to-juvenile transition!





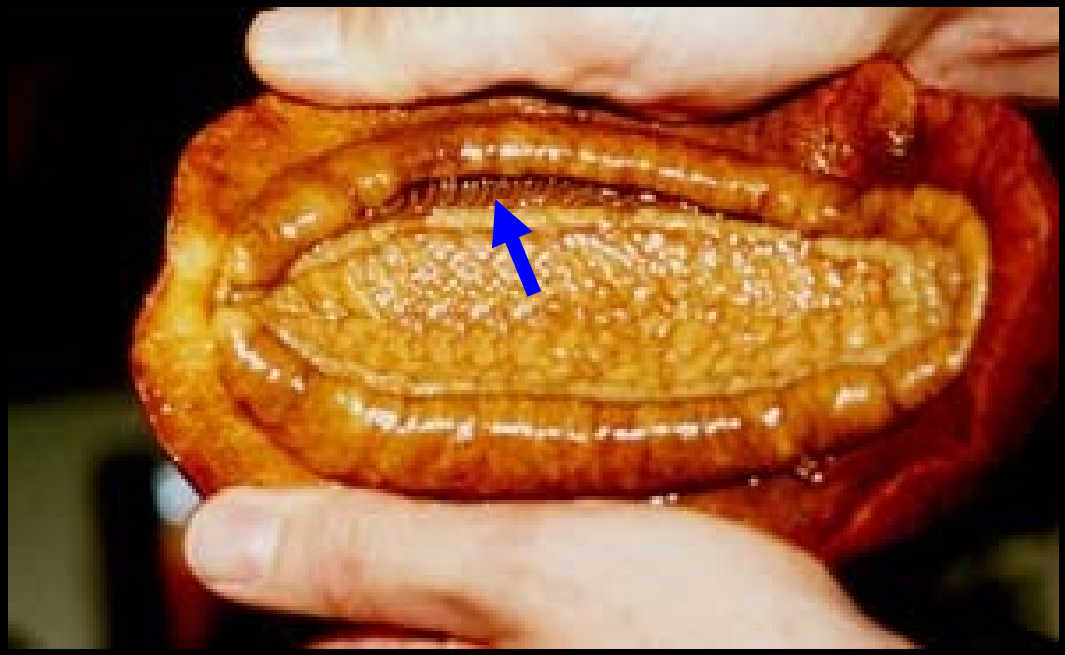
Ph. Mollusca

Cl. Polyplacophora



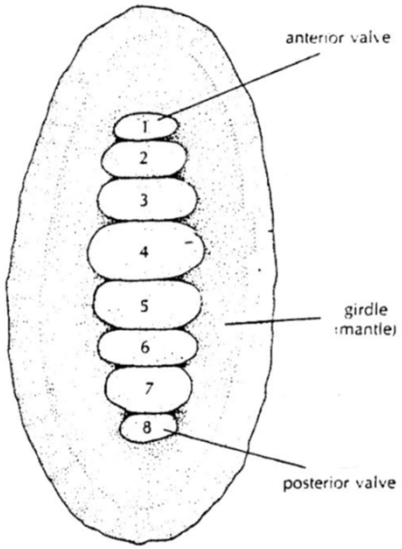
Gumboot chiton
Cryptochiton stelleri

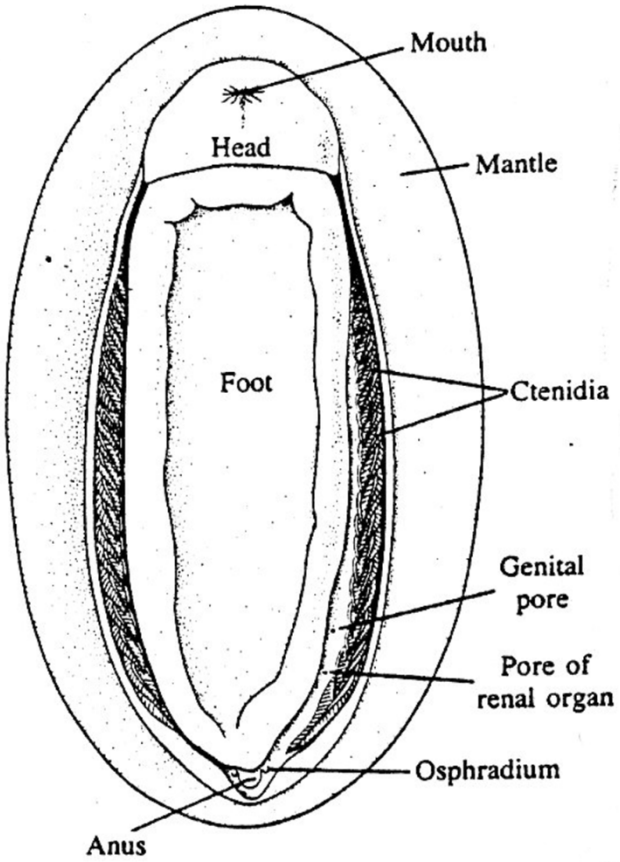
ctenidia in mantle cavity

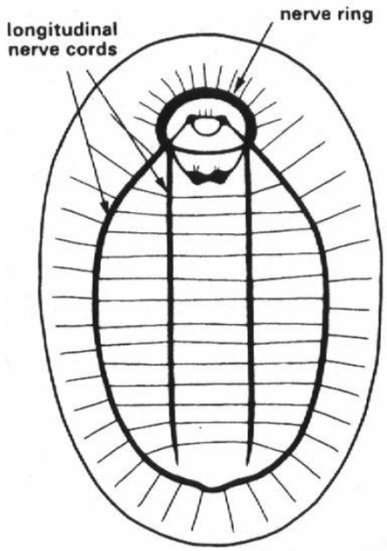


Hairy chiton
Mopalia lignosa

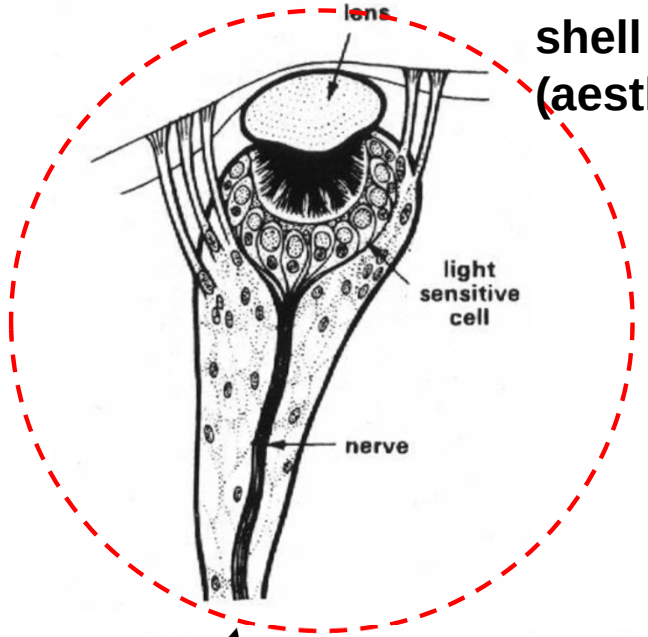
Cl. Polyplacophora

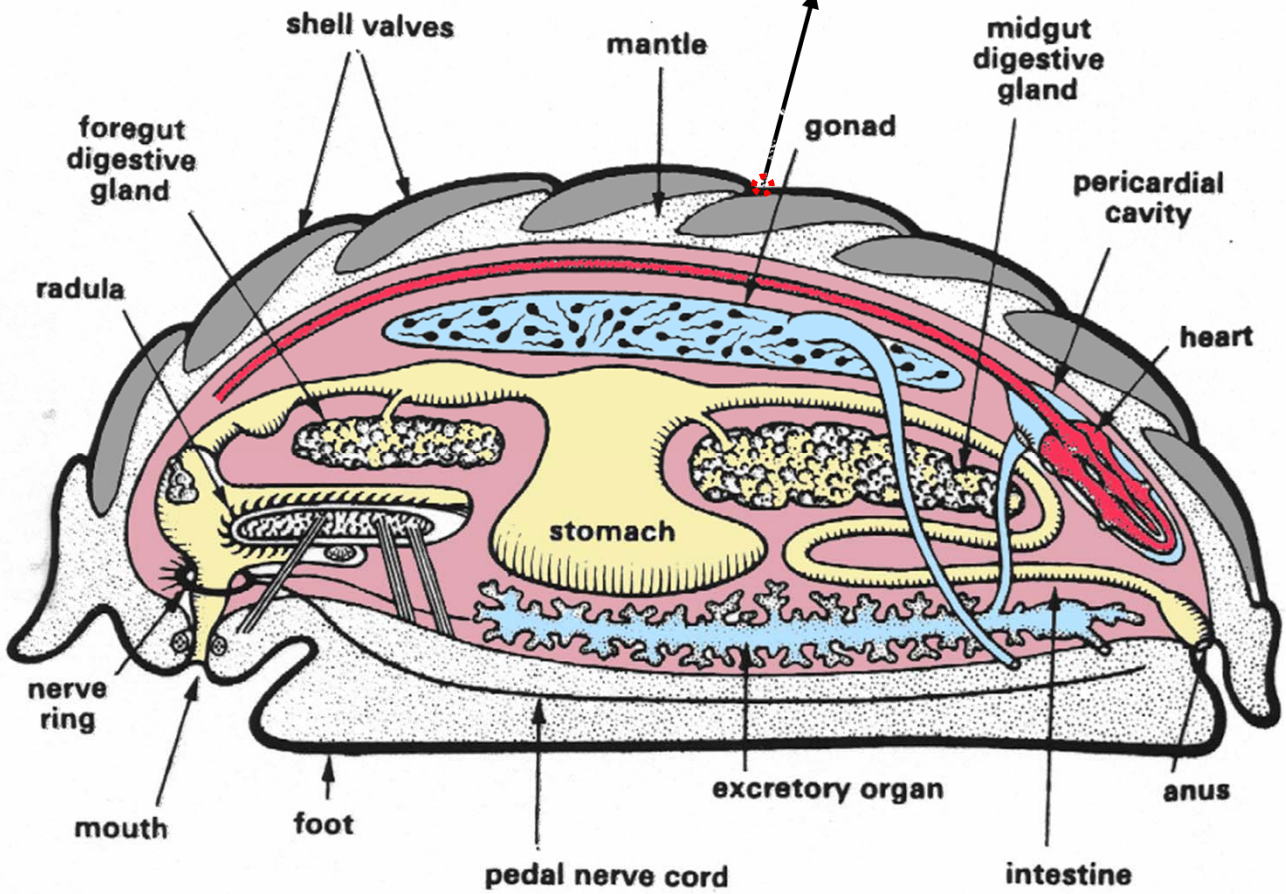


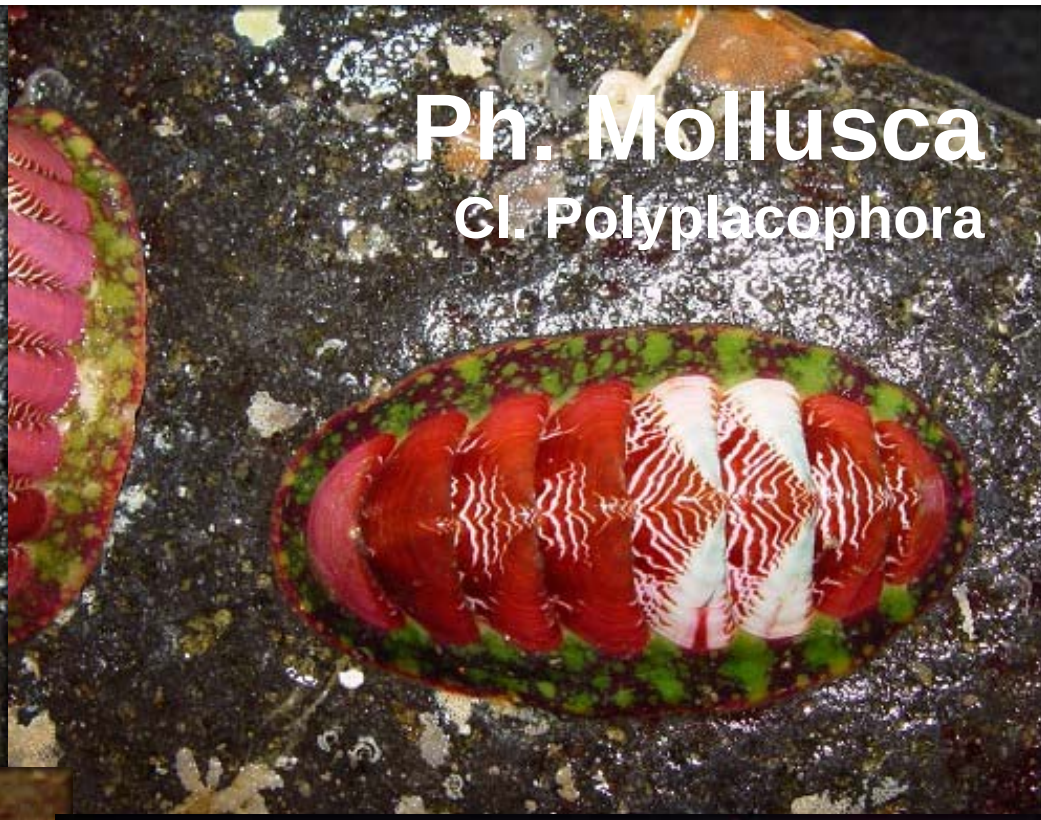




shell eye
(aesthete)

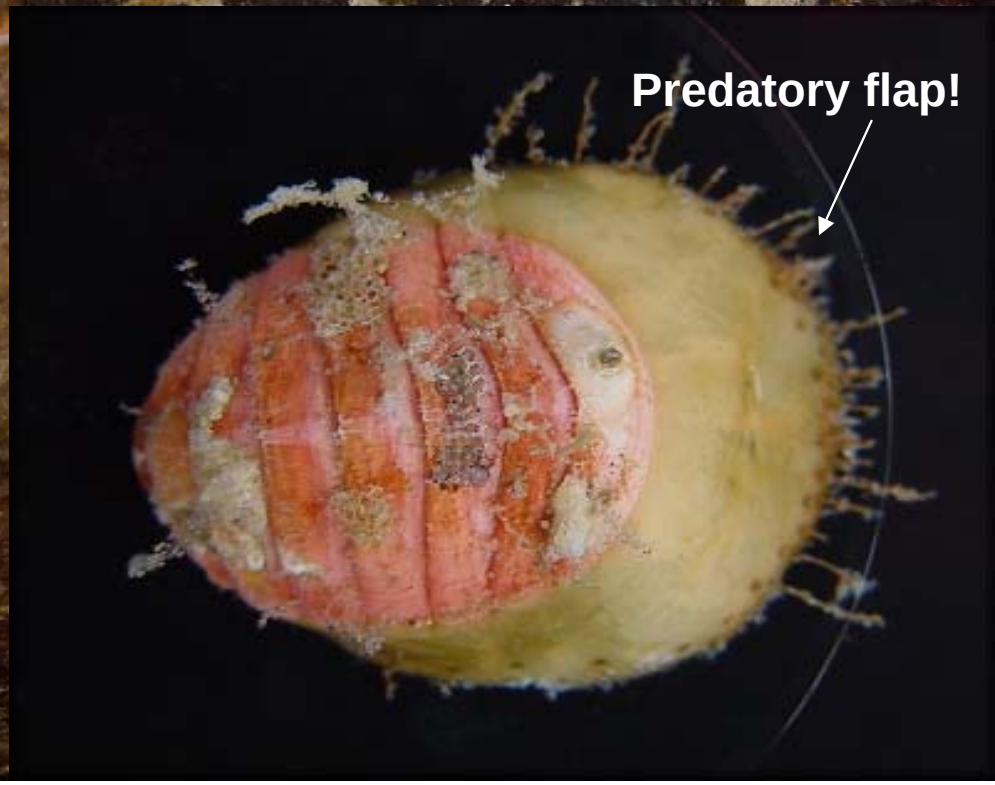






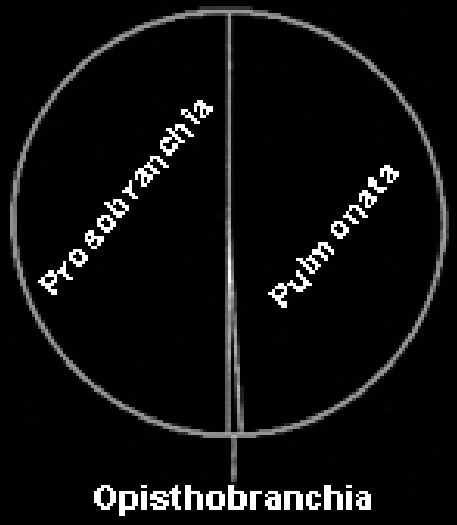
Ph. Mollusca

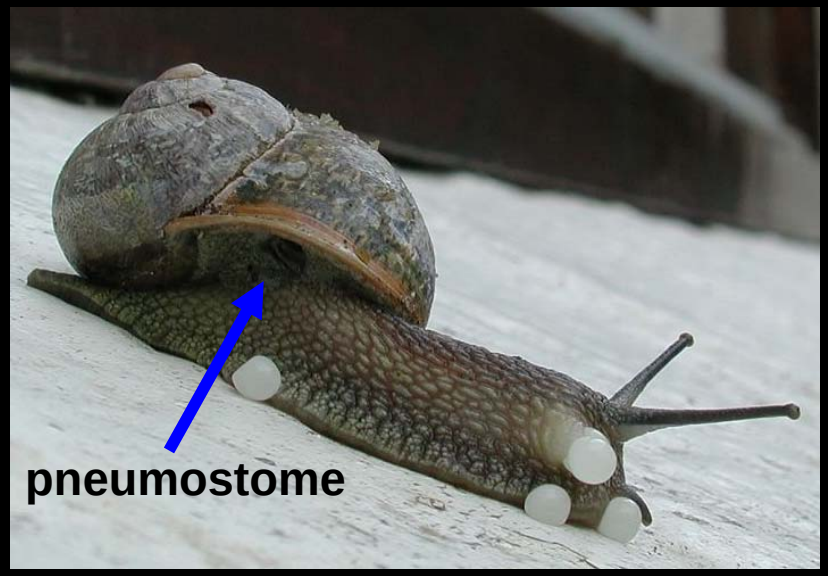
Cl. Polyplacophora



Ph. Mollusca

Cl. Gastropoda



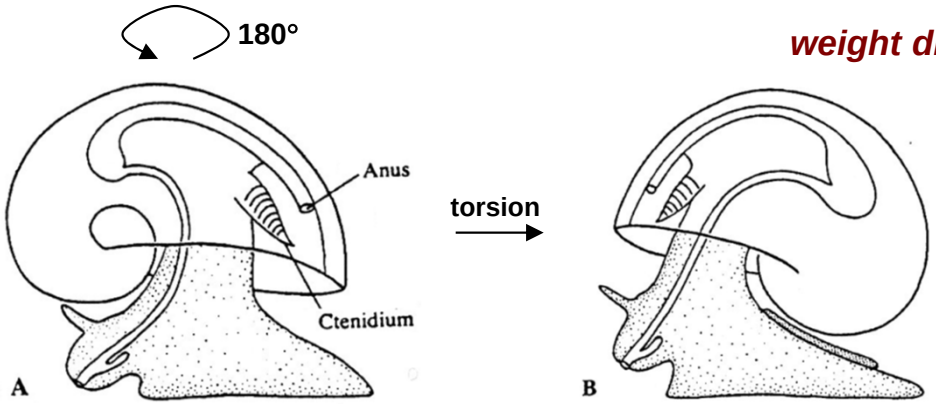


Subcl. Pulmonata
(land snails/slugs)

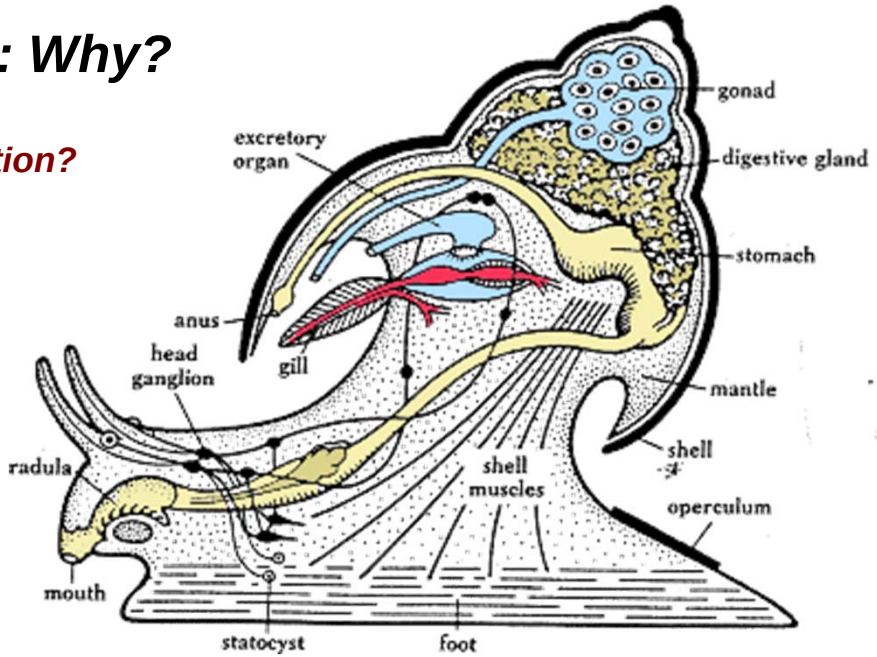
Subcl. Prosobranchia
(snails, limpets)

Subcl. Opishtobranchia
(nudibranchs, bubble snails)

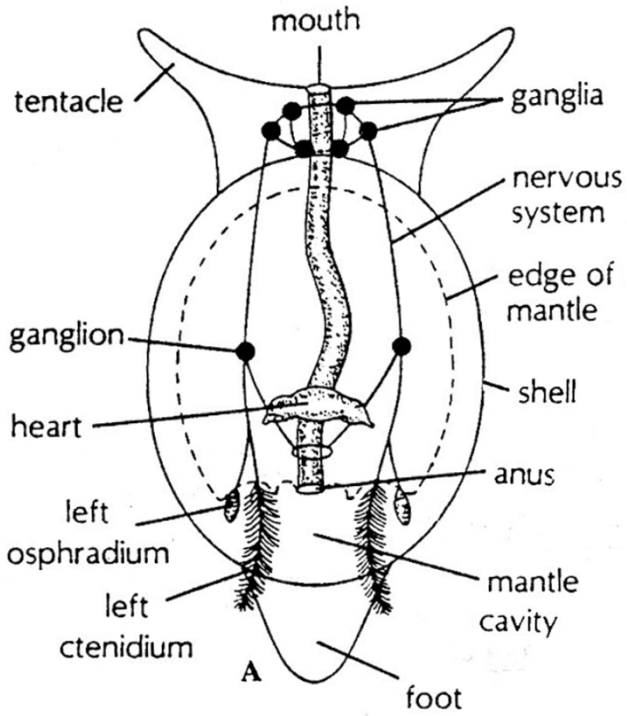
Consequences of gastropod torsion *Q: Why?*



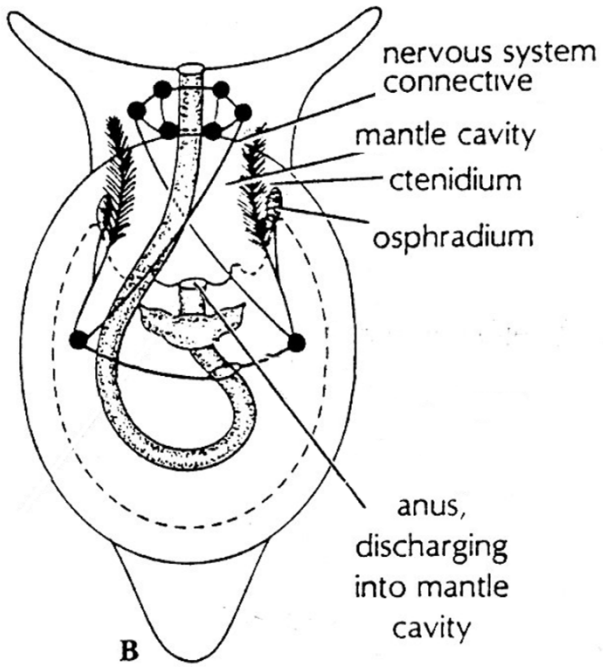
weight distribution?



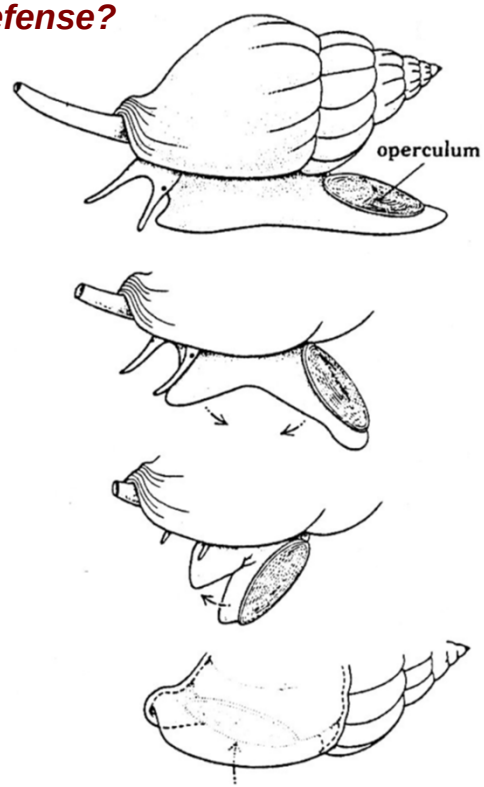
"Pre-torsion"



"Post-torsion"

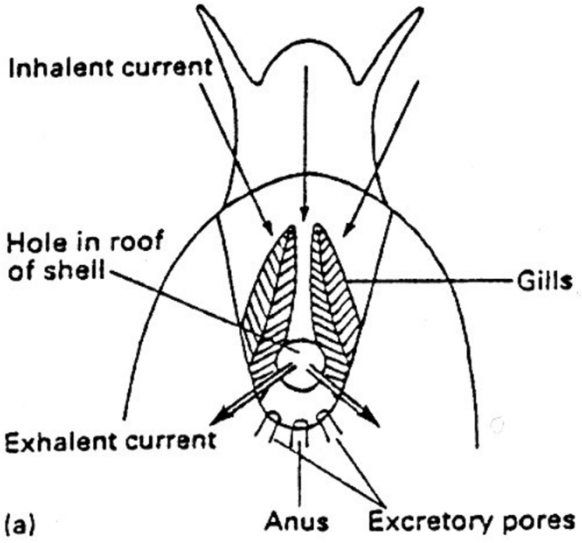


defense?



Consequences of gastropod torsion

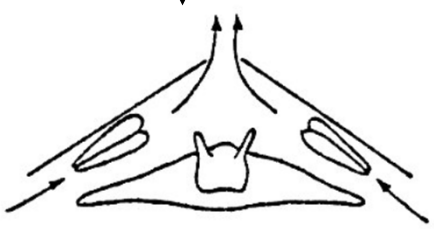
water currents, gas exchange, and defecation



Subcl. Prosobranchia

O. Archaeogastropoda

(keyhole limpet, abalone)



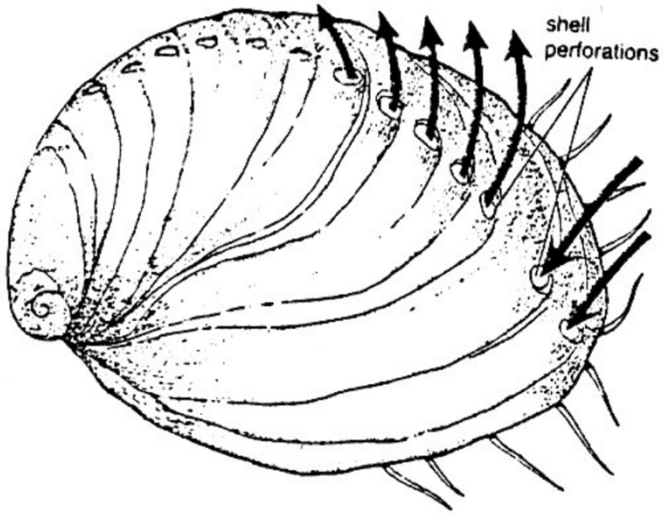
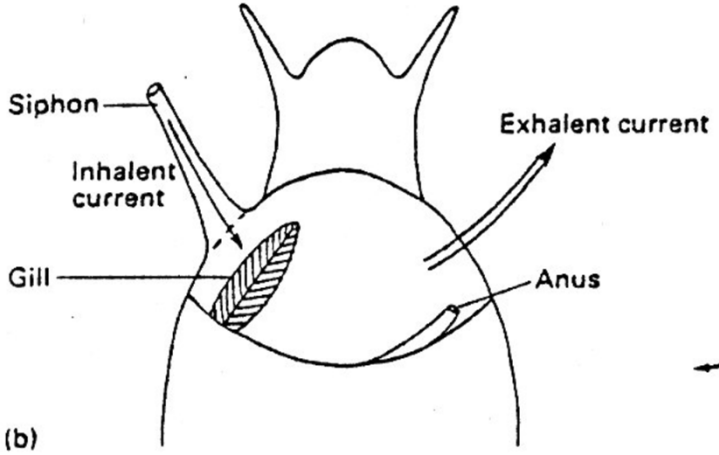
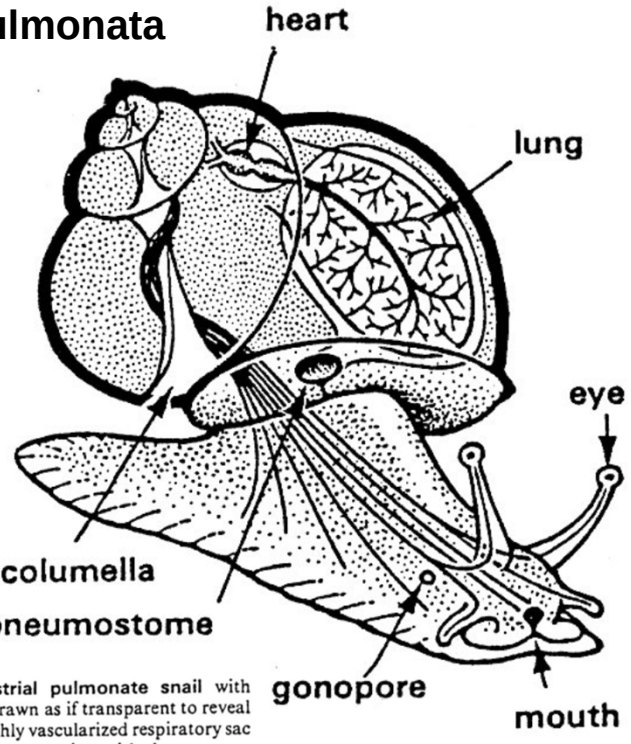


Fig. 5.14 Two modifications of the path of the respiratory water current in gastropods, necessitated by torsion: (a) the exhalent current leaving via a dorsal hole in the shell; (b) loss of the right ctenidium and production of a cross-directed current, the anus being displaced in the direction of the current.

Other prosobranch orders

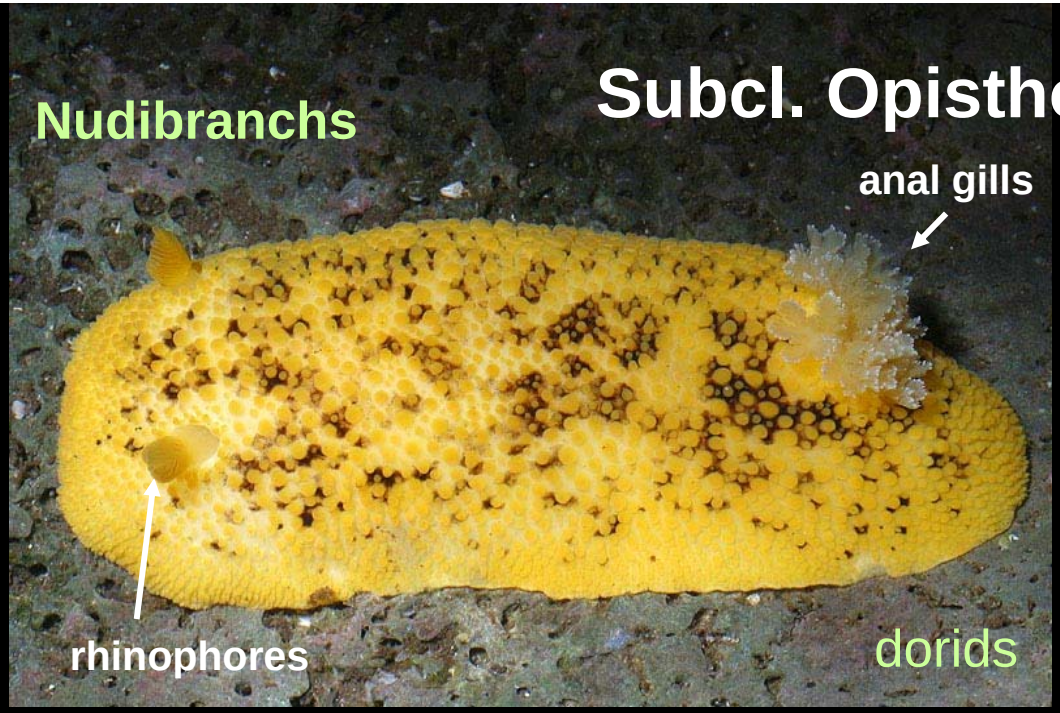


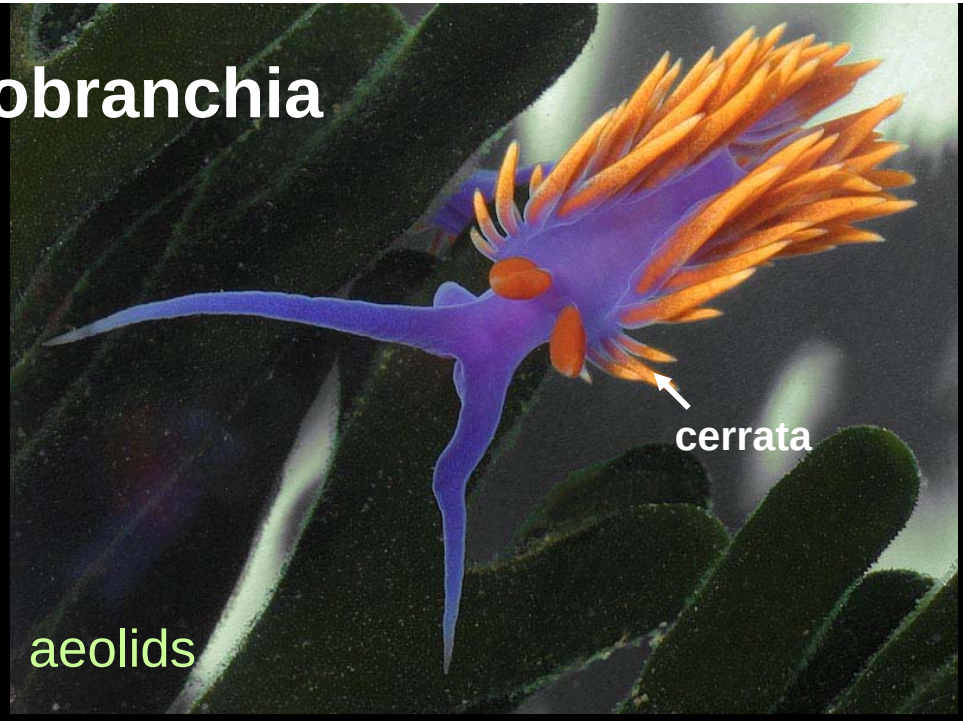
Subcl. Pulmonata

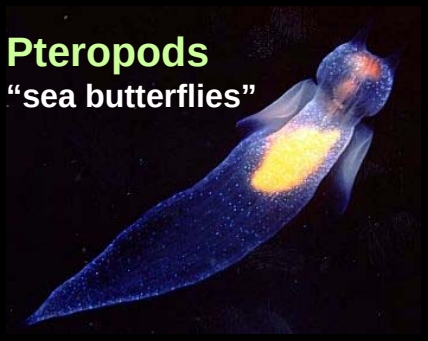


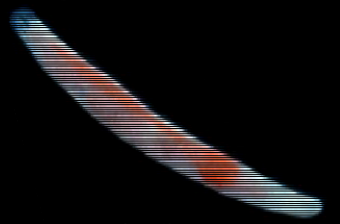
Terrestrial pulmonate snail with shell drawn as if transparent to reveal the highly vascularized respiratory sac and its connection with the pneumostome through which air enters and leaves.

Subcl. Opisthobranchia









Aposematic coloration in nudibranchs

Nudibranch families *Chromodorididae* and *Phyllidiidae*

Flatworm family *Psuedocerotidae*

Mimicry in flatworms

Counter-current gas exchange (in molluscan ctenidia)

(alternative diagrams p. 209)

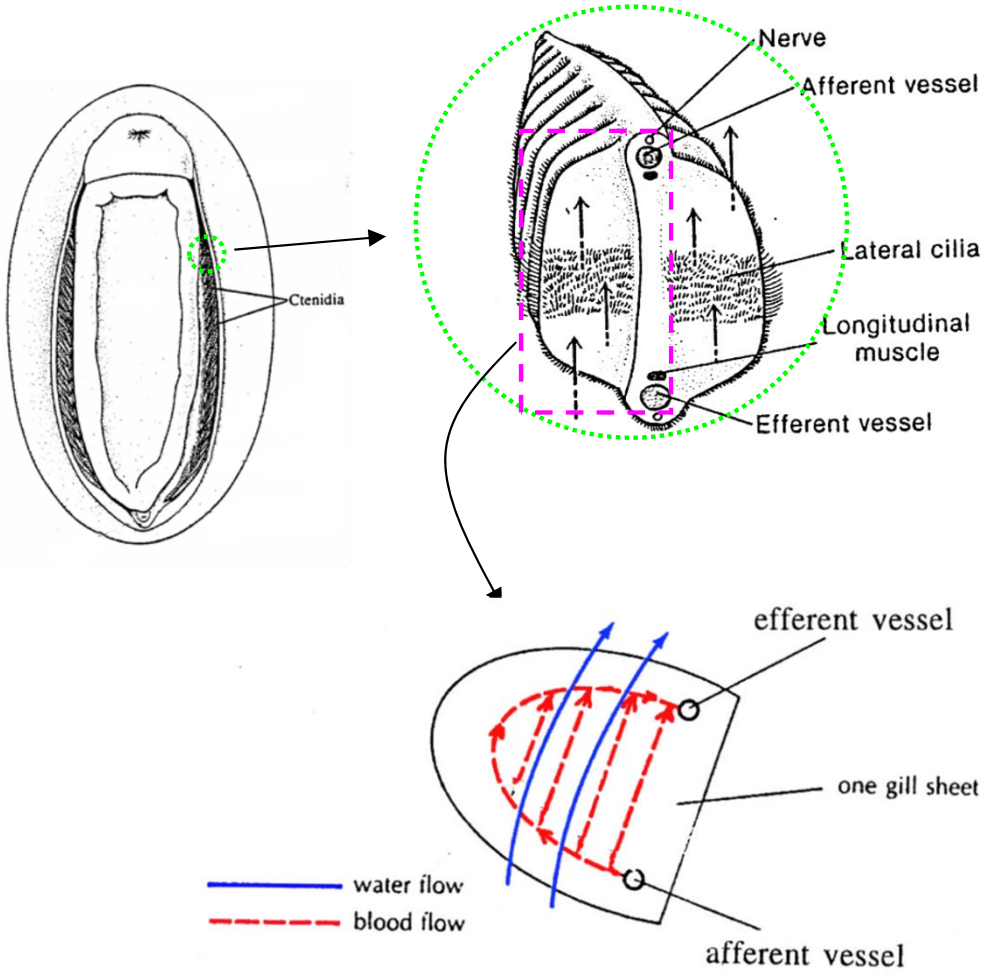
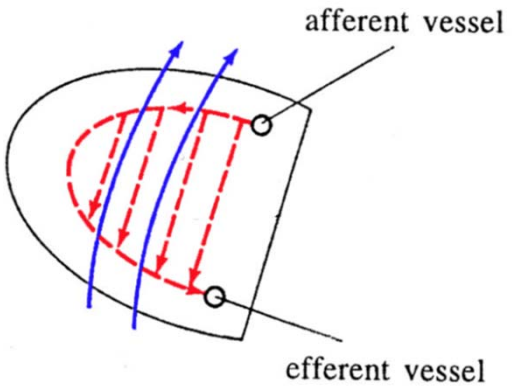
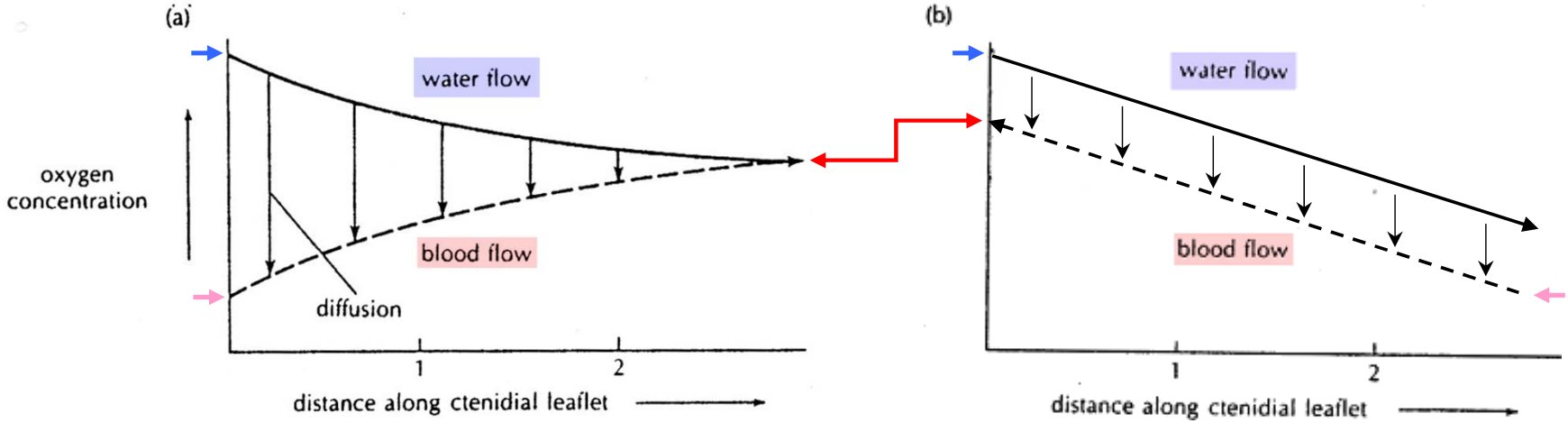


Figure 14.15. Changes in O_2 concentration for cases of (a) water and blood running in the same direction and (b) countercurrent exchange. Note the relative positions of the afferent vessel, which carries O_2-depleted water from the body tissues to the gill, and the efferent vessel, which carries O_2-enriched blood to the heart and then to the body tissues.





Gastropod creeping locomotion

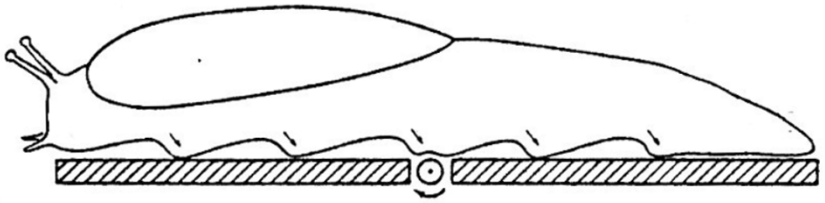
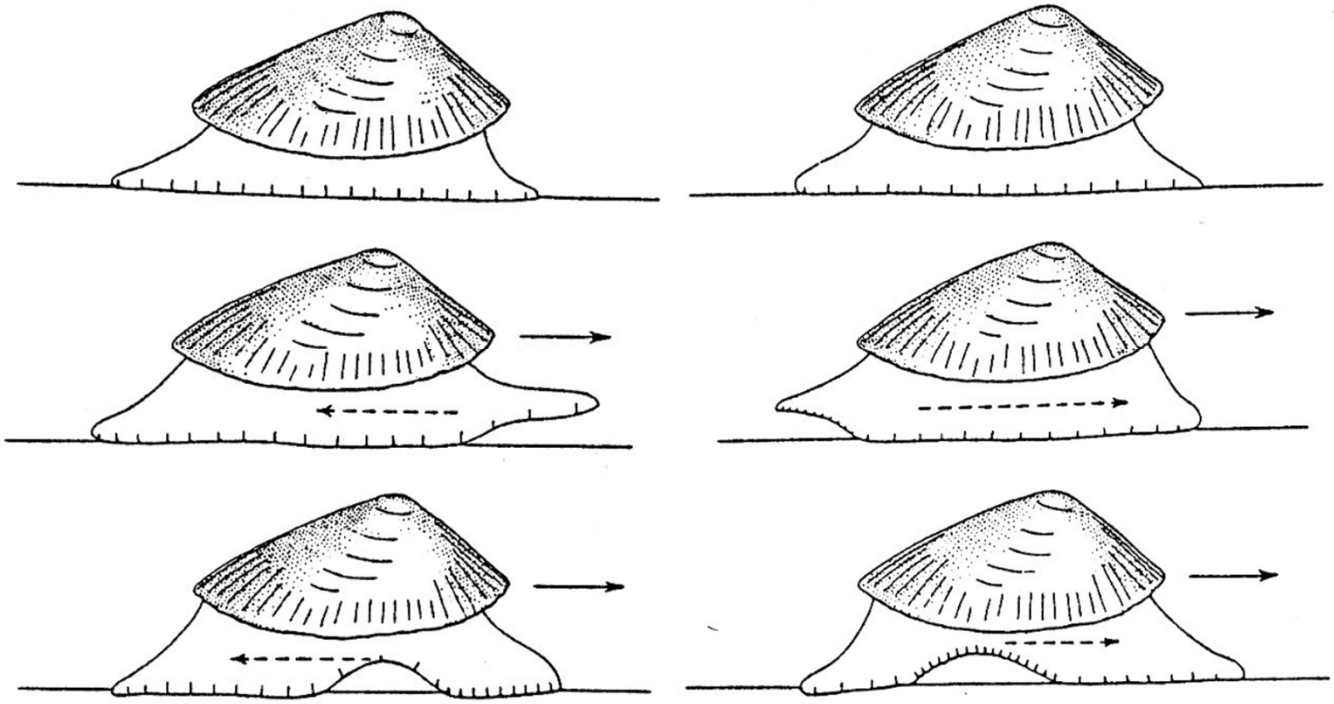


FIGURE 13.18 Diagram showing the waves of muscular activity in the foot of a slug. The roller is turned by the waves as they impinge on it.

Two forms of "creeping" locomotion used by gastropods and chitons. (1) How can waves that move in opposite directions both create forward movement? (2) Which types of muscles must be used, and in what sequence, to achieve each type of wave?



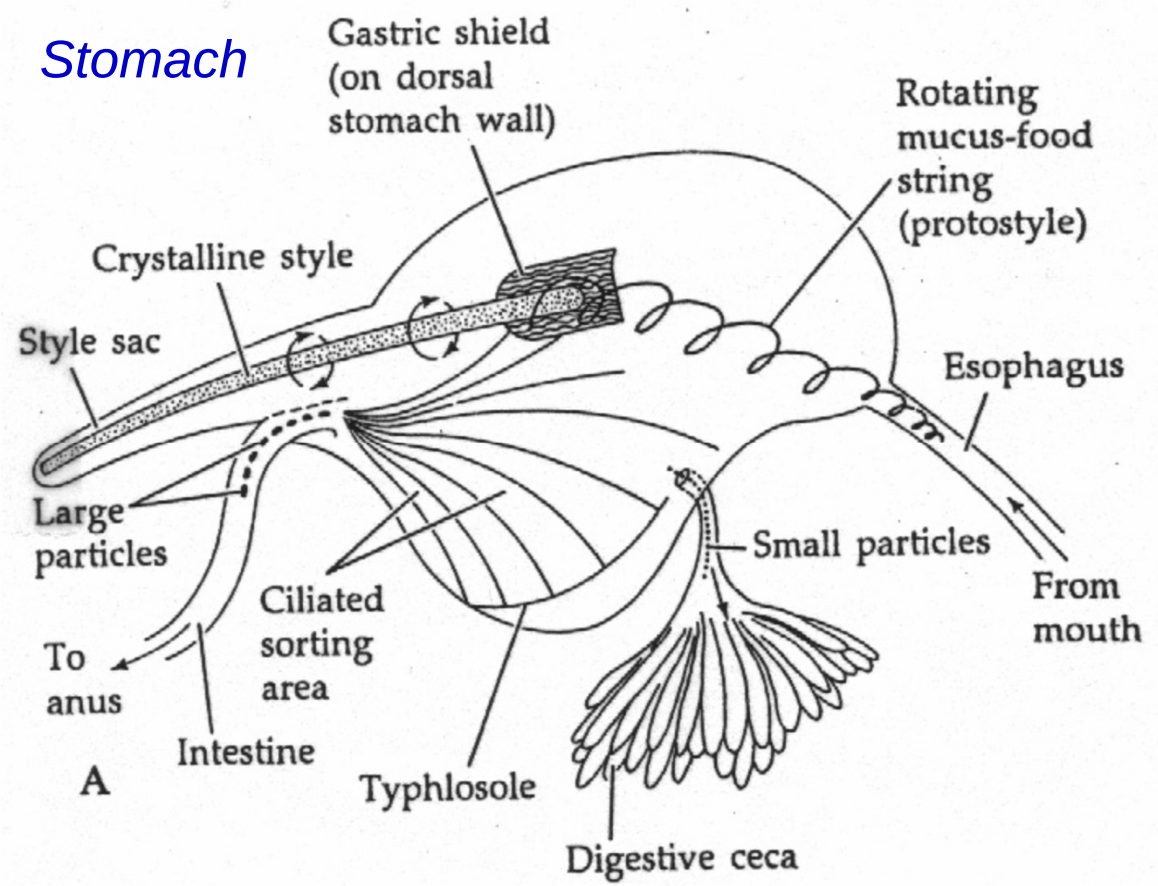
"retrograde" wave

"direct" wave

Gastropod feeding diversity

- Benthic grazing (algal crusts or epiphytes)
- Predation (drilling, browsing)
- Planktonic grazing and predation
- Suspension feeding (with mucus or ctenidia)
- Kleptoparasitism
- Toxic harpooning

Stomach



Digestive system