

Respiratory system

Respiration:

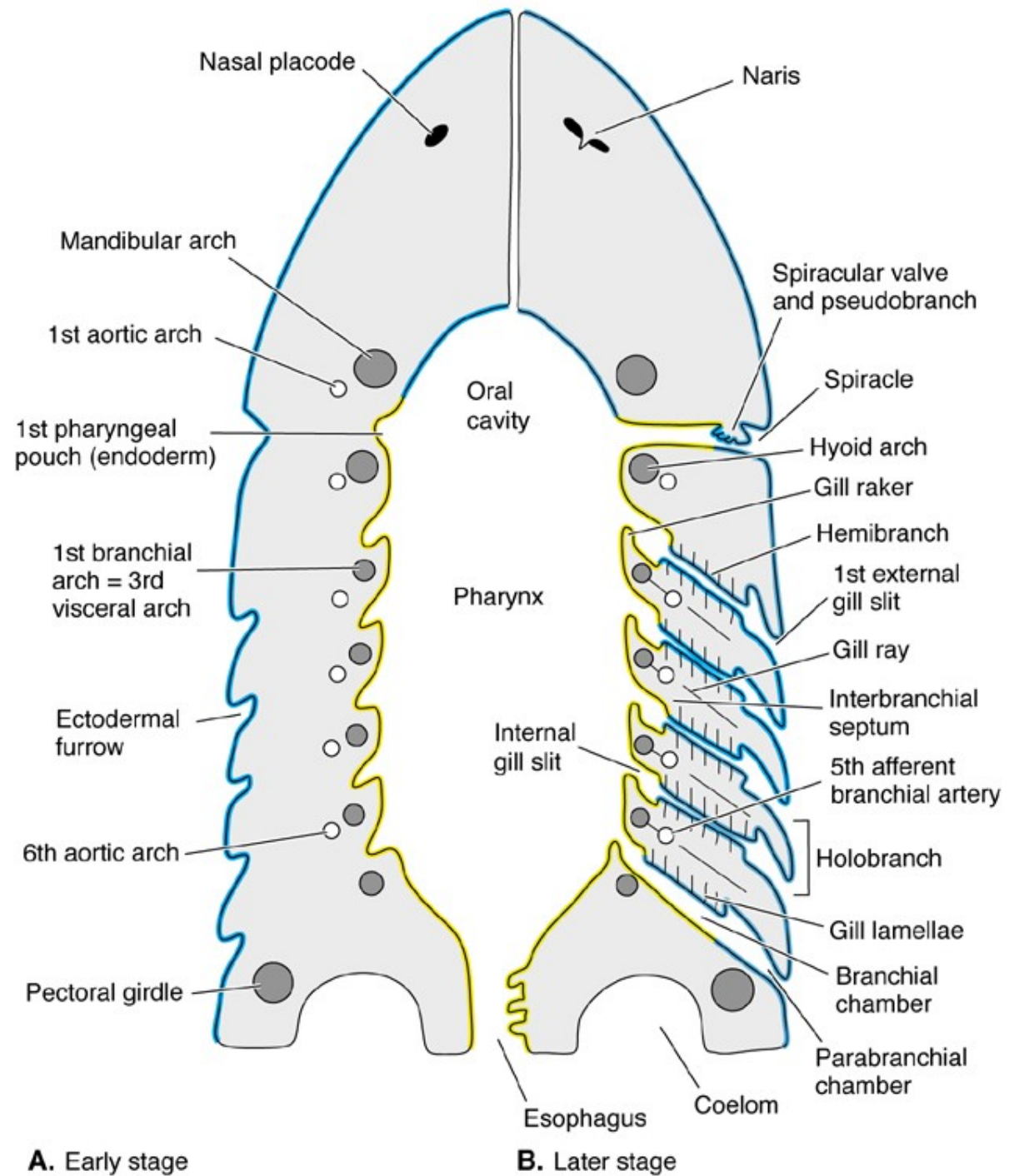
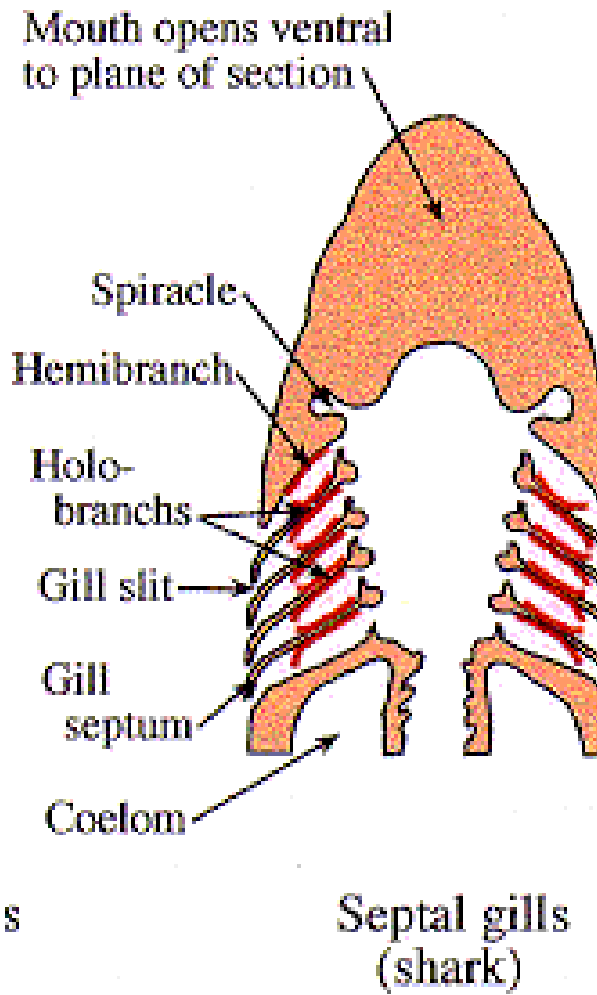
Exchange of respiratory gases.

Respiratory organ, mechanism of respiration and
Physiology of respiration.

Aquatic respiration; gills

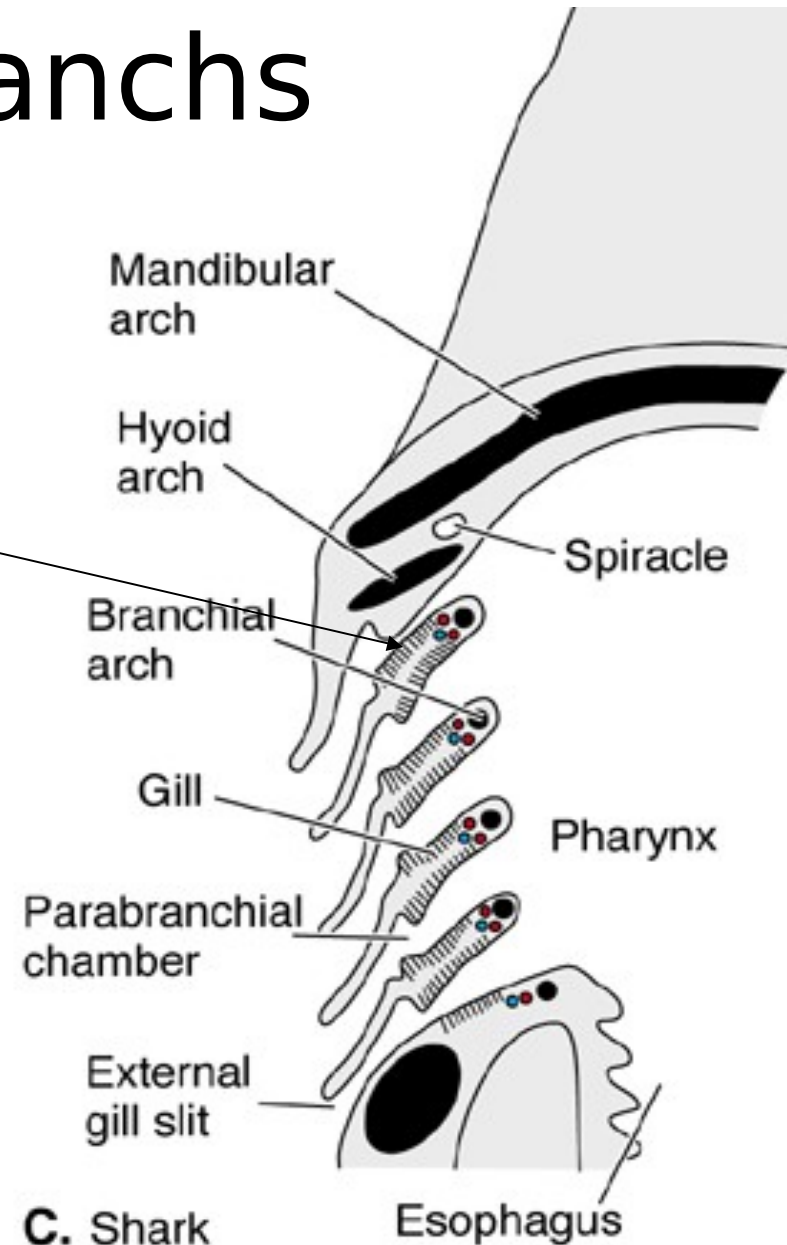
Internal branchial aperture and
external branchial aperture

Branchial lamellae and inter-branchial septa
visceral arch, gill rays; gill rakers.



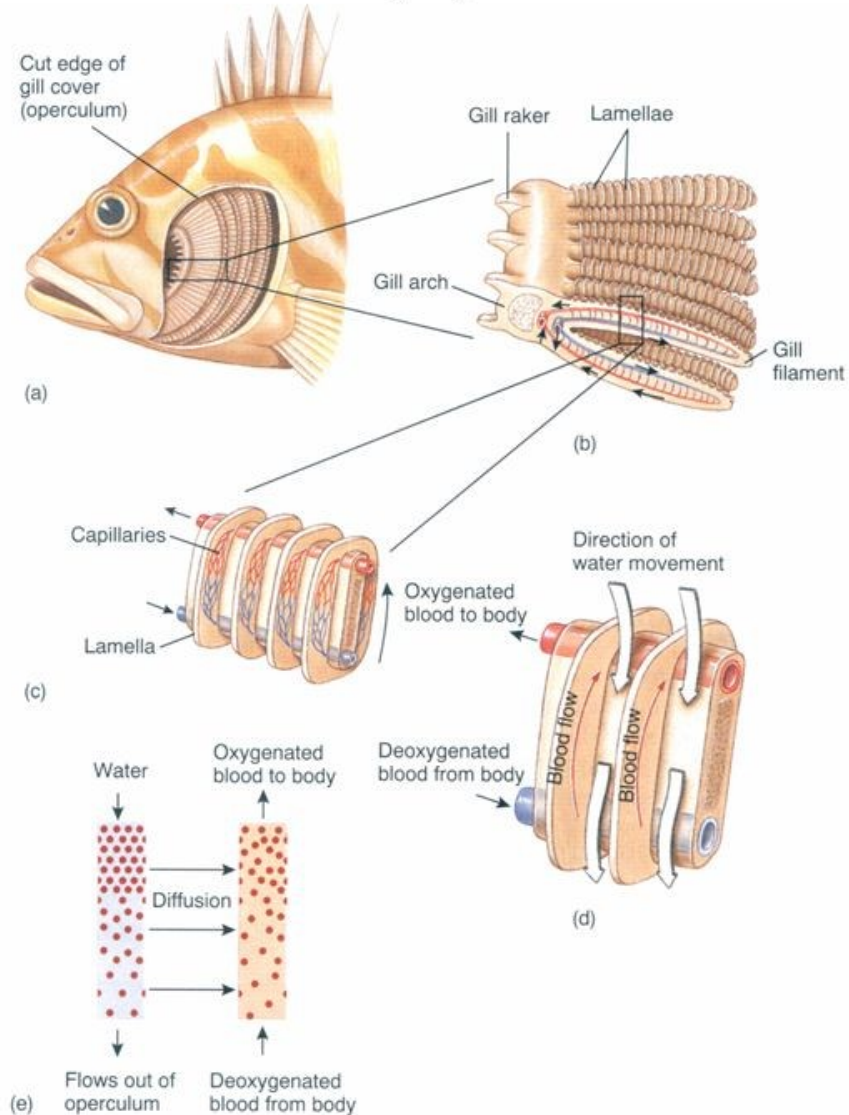
Gills of Elasmobranchs

- Branchial pouches
 - Narrow chambers
 - Lamellae on Septa
 - “Septal” Gills



Marine Fishes – Circulatory System

Gas exchange occurs in the gills, where a counter-current flowing blood/water system allows for very efficient oxygenation of the blood...



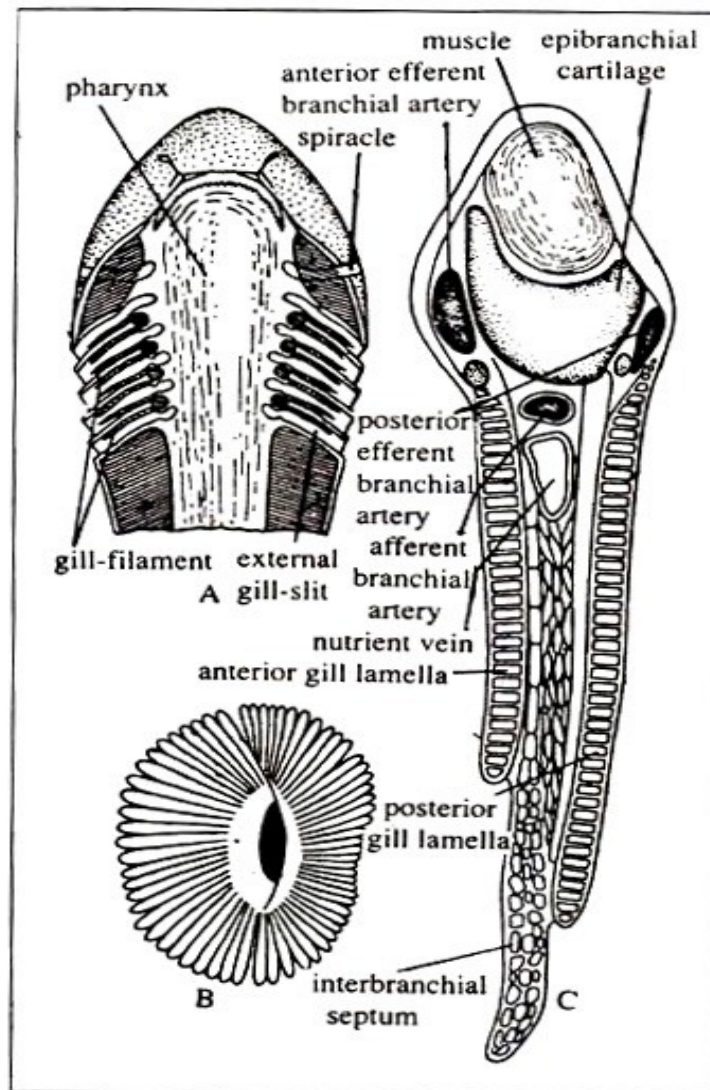


Fig. 6.8 : Respiratory structures of dogfish. A. Dissection of the head showing the position of the gill apparatus of *Scoliodon*. B. Structure of a gill-pouch of *Brachaelurus*. C. Diagrammatic sectional view of a holobranch of *Scoliodon*.

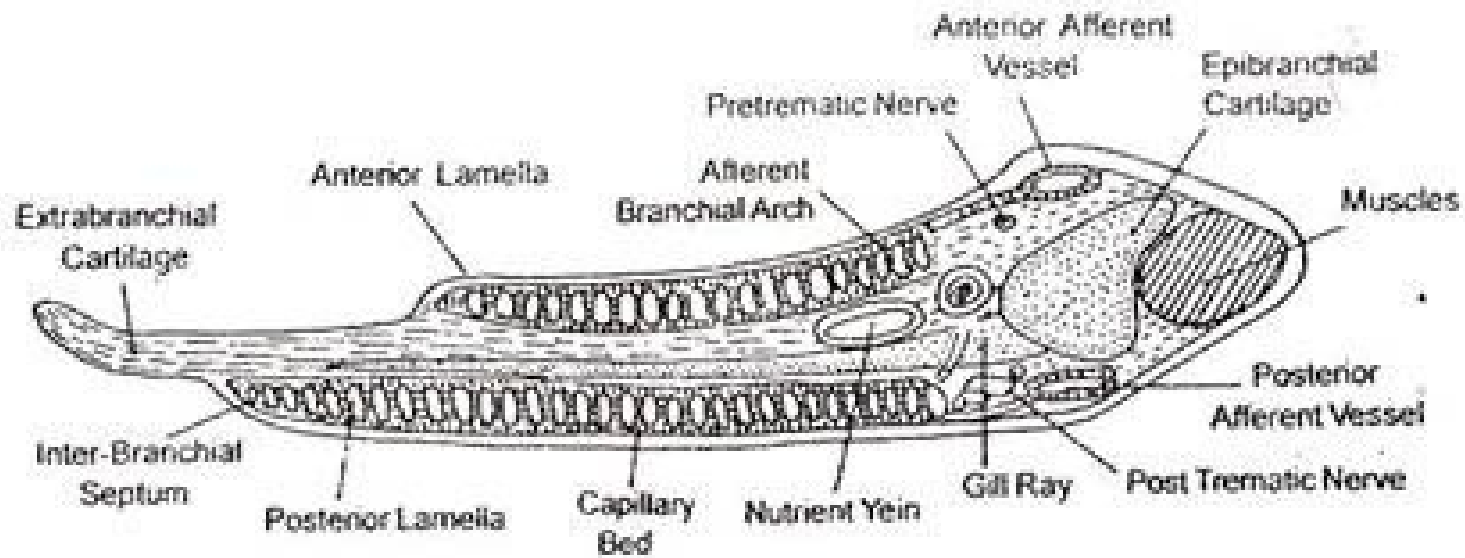
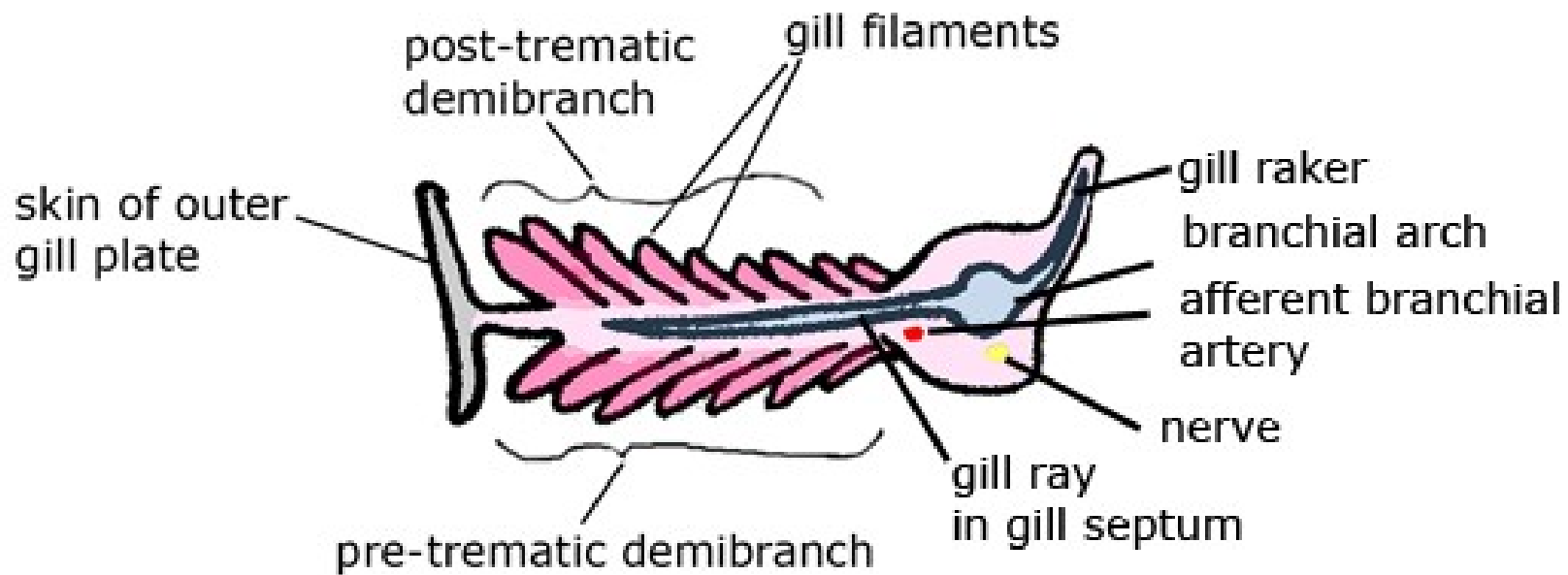
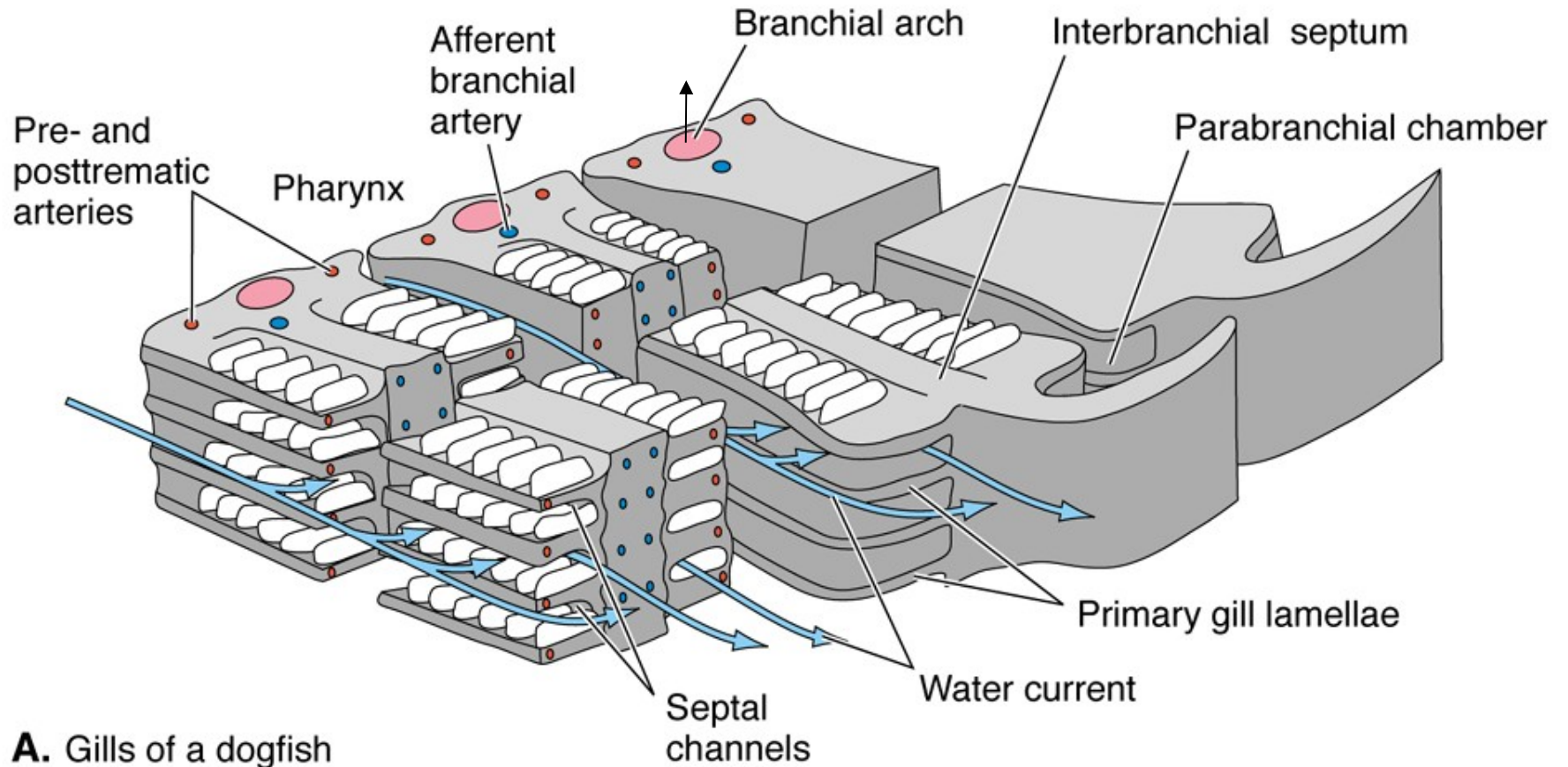


Fig.7.6 *Scoliodon* – horizontal section of a holobranch, arrows indicate the flow of blood.



(Efferent flow to dorsal aorta)



A. Gills of a dogfish

Respiratory organ

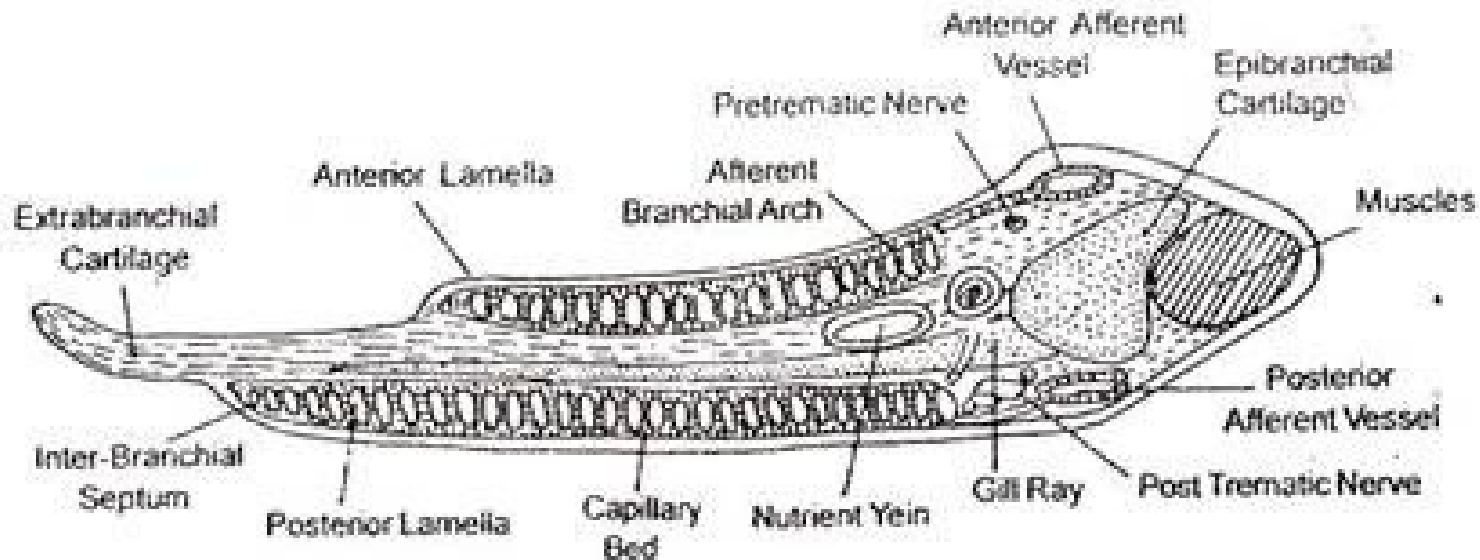


Fig.7.6 Scoliodon – horizontal section of a holobranch, arrows indicate the flow of blood.



Respiration:

pairs of gill slits or gill pouches

Each gill septum is supported by a cartilaginous viscer

Each or gill arch with its slender branchial rays

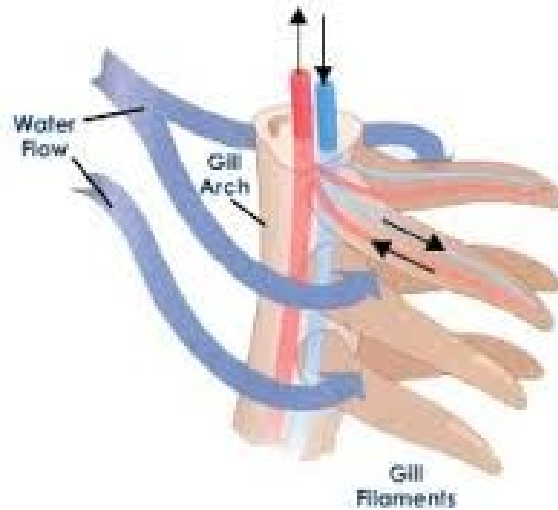
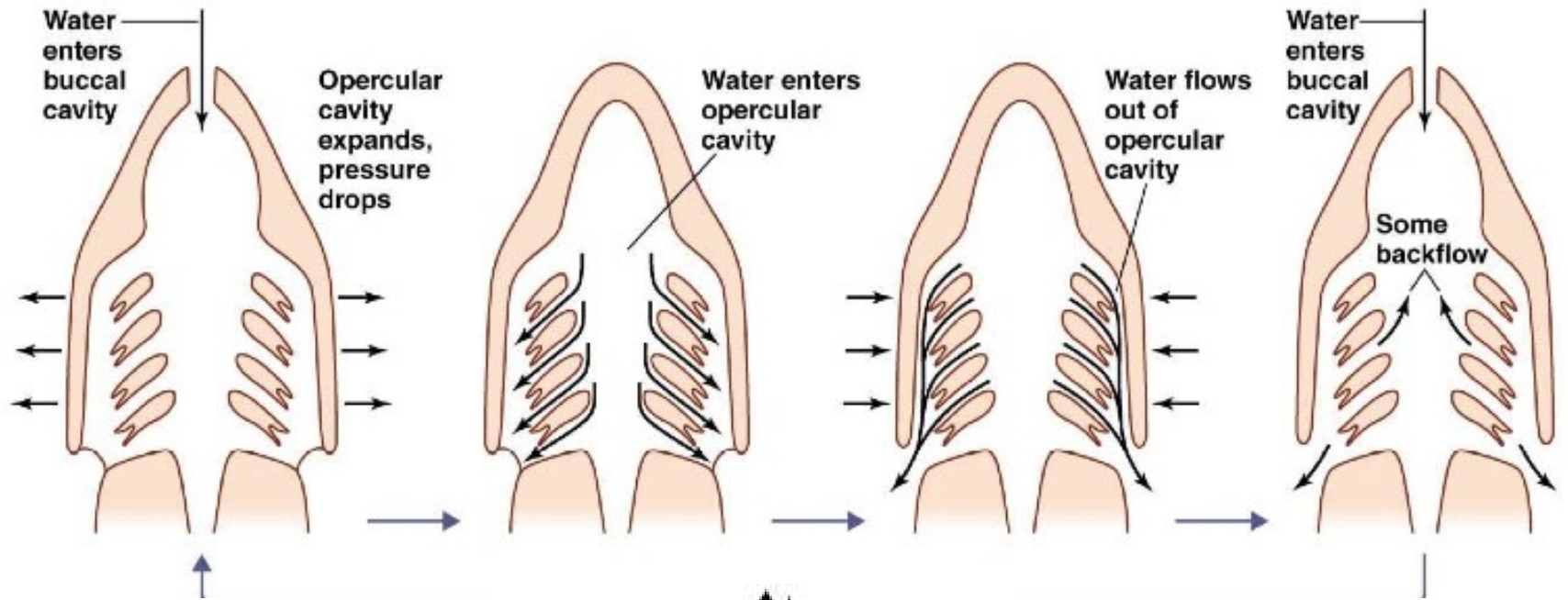
Horizontal leaf like folds called gill lamellae or gill

filaments. Each septum bears two sets of gill-lamellae

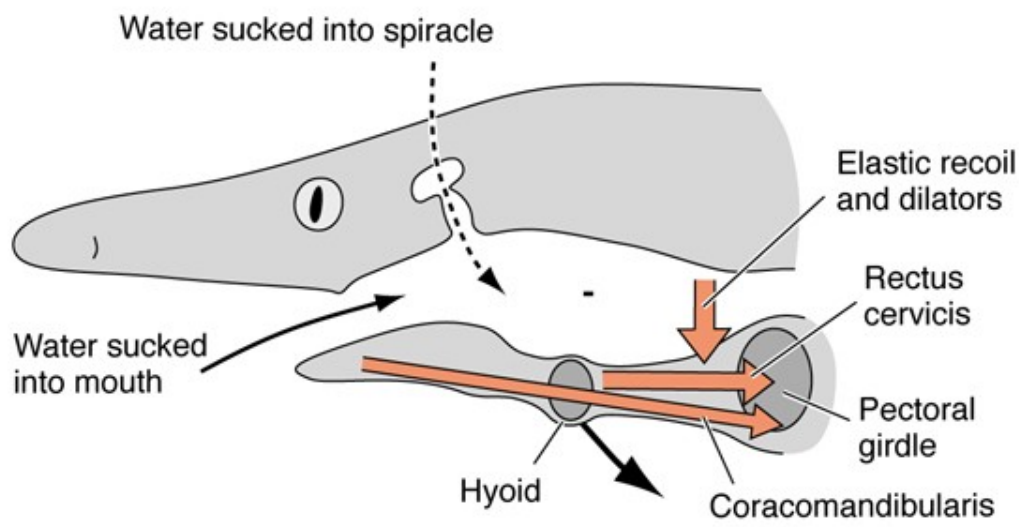
Mechanism of respiration

Inspiration:

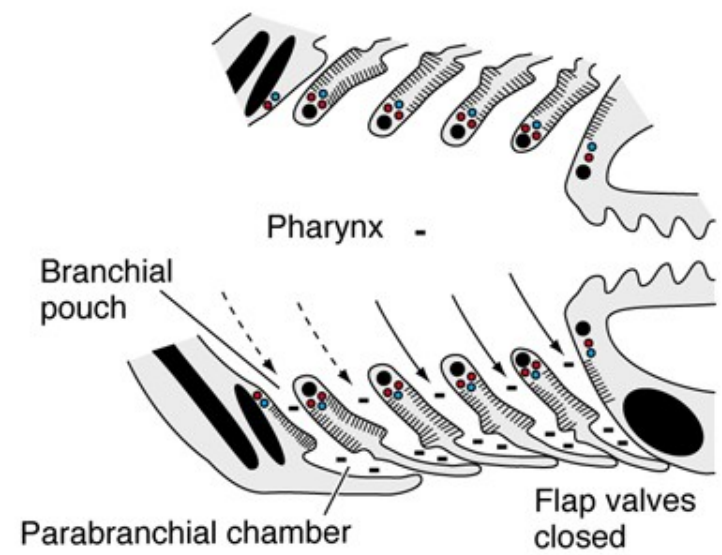
Expiration:



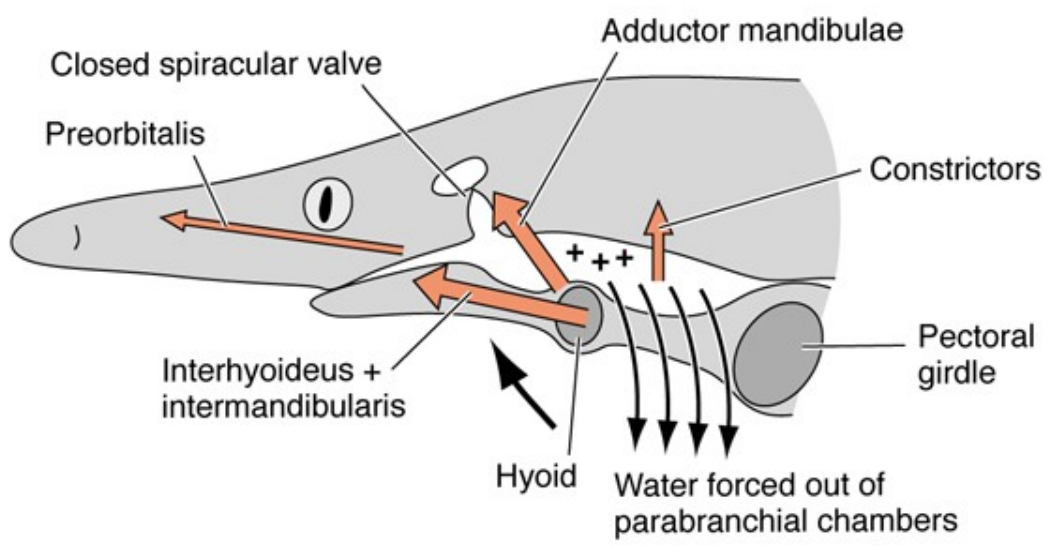
Pump Ventilation in the Dogfish



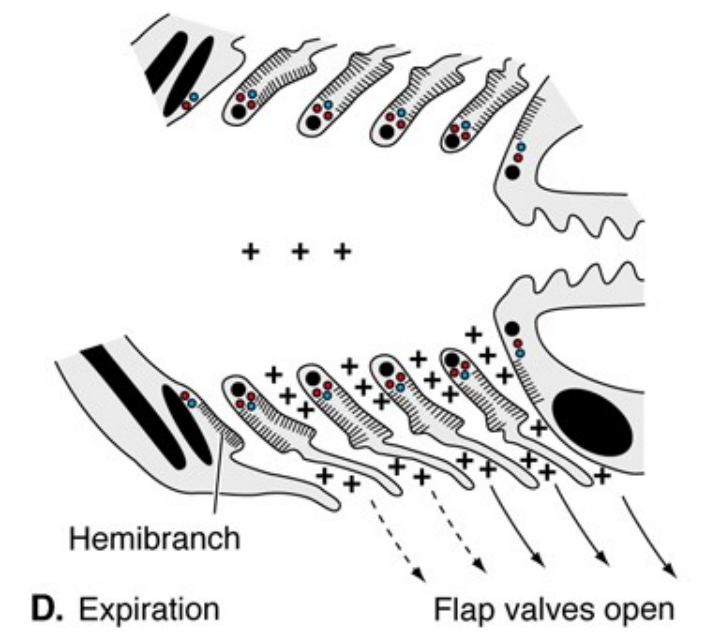
A. Suction pump



B. Inspiration



C. Force pump



D. Expiration

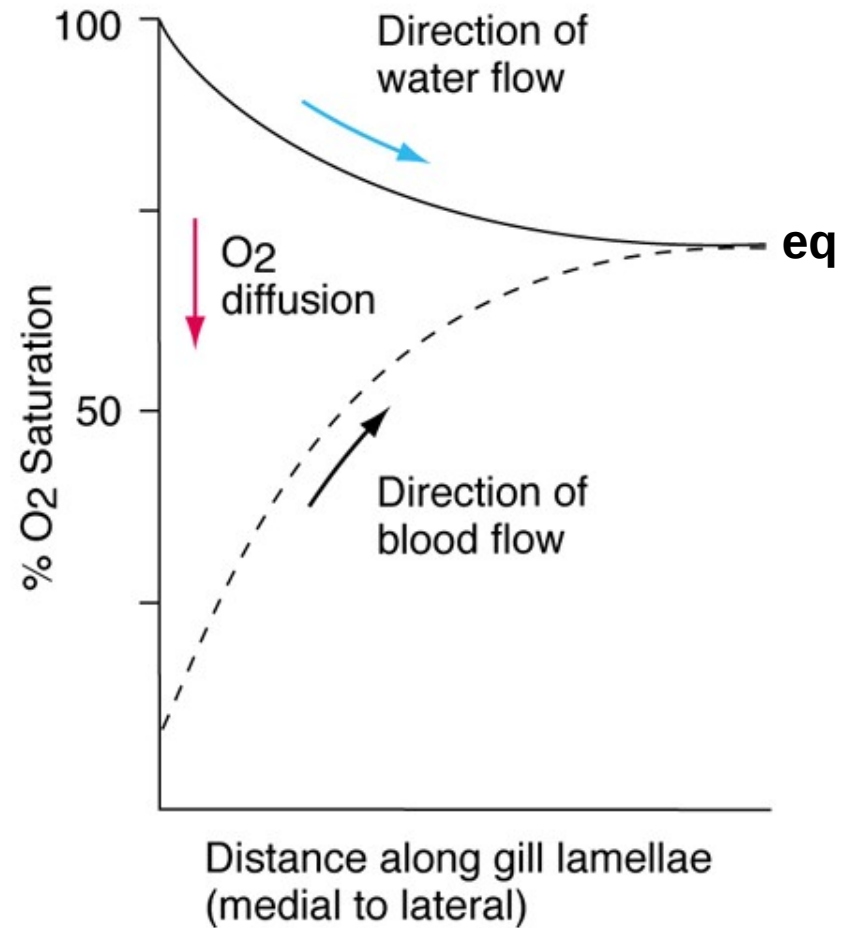
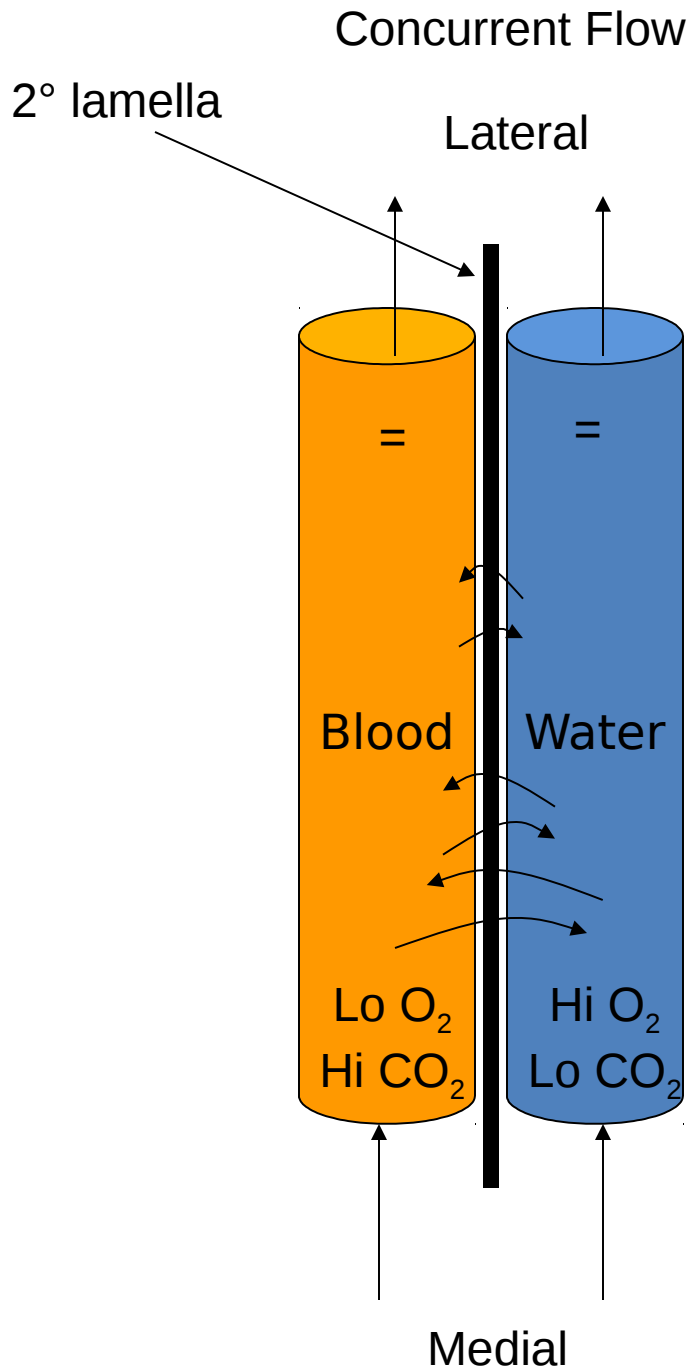


Physiology of Respiration :

Venous blood from an afferent branchial artery and pass it on to an efferent or epibranchial artery.

During the passage of blood through this network it becomes oxygenated by exchanging O_2 and CO_2 between the water and blood. This process is called external respiration.

As this oxygenated blood circulates through body its O_2 is used by tissues to oxidise food stuffs and CO_2 is released into blood which is formed during oxidization of food stuffs. This



A. Concurrent flow

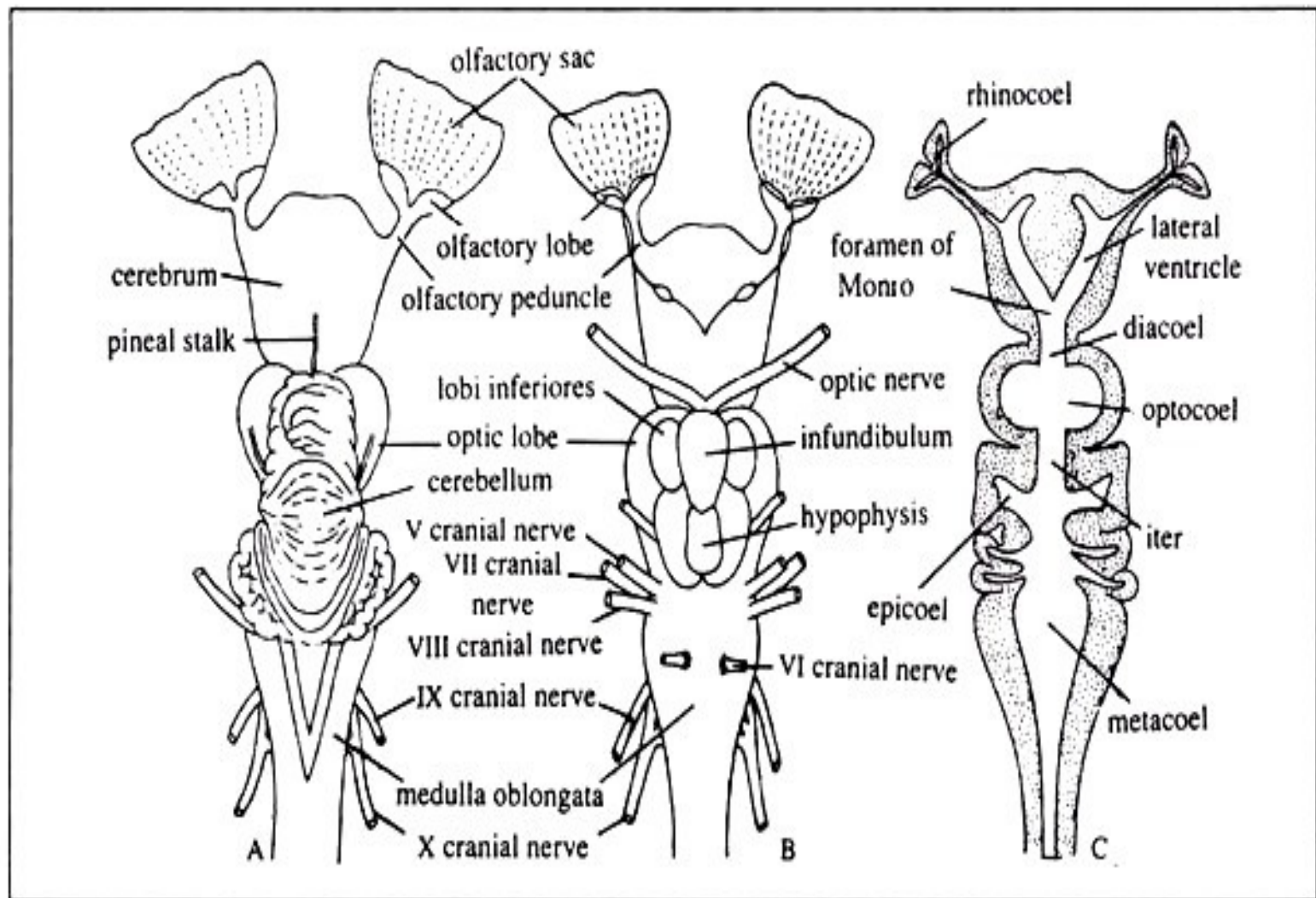


Fig. 6.12 : Brain of *Scoliodon*. A. Dorsal view. B. Ventral view. C. Diagrammatic longitudinal section. Note the position of different ventricles.