

Deuterostomes

Bryozoa

Phoronida "lophophorates"

Brachiopoda

Echinodermata

Asterozoa

Stelleroidea

Asteroidea

Ophiuroidea

Echinozoa

Holothuroidea

Echinoidea

Crinozoa

Crinoidea

Chaetognatha (arrow worms)

Hemichordata (acorn worms)

Chordata

Urochordata (sea squirt)

Cephalochordata (amphioxoius)

Vertebrata

PHYLUM CHAETOGNATHA (70 spp) Arrow worms

Fossils from the Cambrium

Carnivorous - link between small phytoplankton and larger zooplankton (1-15 cm long)

Pharyngeal gill pores

No notochord

Peculiar origin for mesoderm (not strictly enterocoelous)

Uncertain relationship with echinoderms

PHYLUM HEMICHORDATA (120 spp) Acorn worms

Pharyngeal gill pores

No notochord (Stomochord cartilaginous and once thought homologous w/notochord)

Tornaria larvae very similar to asteroidea Bipinnaria larvae

CLASS ENTEROPNEUSTA (acorn worms)

Marine, bottom dwellers

CLASS PTEROBRANCHIA

Colonial, sessile, filter feeding, tube dwellers

Small (1-2 mm), "U" shaped gut, no gill slits

PHYLUM CHORDATA

Body segmented

Axial notochord

Dorsal hollow nerve chord

Paired gill slits

Post anal tail

SUBPHYLUM UROCHORDATA

Marine, sessile

Body covered in a cellulose tunic ("Tunicates")

Filter feeder (200 L/day) - perforated pharynx

adapted for filtering & respiration

Pharyngeal basket contractable - squirts water when exposed at low tide

Hermaphrodites

Tadpole larvae w/chordate characteristics (neoteny)

CLASS ASCIDIACEA (sea squirt/tunicate - sessile)

No excretory system

Open circulatory system (can reverse blood flow)

Endostyle - (homologous to thyroid of vertebrates) ciliated groove secretes

mucous - cilia (distributed over pharyngeal basket) trap plankton

which are transported to esophagus

Monoecious - can reproduce by budding!!

CLASS THALIACEA - free-swimming plankton

CLASS LARVACEA - small neotonic plankton

Phylum Chordata

SUBPHYLUM CEPHALOCHORDATA (Amphioxus)

Fish-like, borrows in sandy bottoms

Metameristic

Adult stage has all chordate characteristics

Pharyngeal gill slits function in filter feeding

Once thought to be direct line to vertebrates, but animals have too many specialized features to be considered primitive to vertebrates

Metapleural Folds to paired fins

Myomeres - blocks of muscles for swimming

Dioecious - external fertilization

No heart - arteries contract

No brain

Protonephridia