

PHYLUM CHORDATA (Ch. 26)

1. INTRODUCTION

3 subphyla - 2 invertebrates plus vertebrates

hallmark characteristics

1. notochord - cellular endoskeleton
 - dorsal to digestive tract, flexible support
2. dorsal hollow nerve cord
 - tubular, dorsal to notochord
3. pharyngeal gill slits - originally for filter-feeding
 - evolved for respiration
4. postanal tail - originally for swimming

2. SUBPHYLUM UROCHORDATA

tunicates - 2k species, size mm to 30 cm

- marine filter-feeder, barrel-shaped
- adult sessile (larva free-swimming)

tunic - cellulose coat outside body

atrium - internal cavity, circulates seawater

branchial sac - basket in throat, filters seawater

chordate characteristics - retain gill slits in branchial sac

- lose notochord, nerve cord, & tail

3. SUBPHYLUM CEPHALOCHORDATA

lancelets - 30 species, size 5 to 10 cm

- marine filter-feed, elongate & flat
- adult burrow (larva swim)

head - protrudes from burrow, surrounded by tentacles

atrium - in throat, water exits thru separate pore

pharynx - in atrium, for filter-feeding

- water exits thru gill slits

chordate characteristics - idealized model of chordate
- retain notochord, nerve, gill slits, & tail

4. SUBPHYLUM VERTEBRATA

diversity - 42.5k species, size 1 cm to 30 m
- 2 pairs of appendages (pectoral & pelvic)

chordate characteristics - only during embryo
- notochord replaced by vertebrae
- nerve cord developed into spinal cord & brain
- gill slits respiratory or nonfunctional
- postanal tail variable

2 superclasses

- Pisces - 3-4 classes of fishes
- Tetrapoda - 4 classes of land vertebrates

5. EVOLUTION

evolved from which phylum?

- every major phyla proposed, but none explains ventral nerve/heart & dorsal digestive tract

ancestral deuterostome evolved 2 branches

- >> echinoderm (evolved radial)
- >> chordate (remained bilateral)
 - >> tunicate (evolved sessile)
 - >> neotenous (remained free-swimming)
 - >> lancelet (overdeveloped notochord)
 - >> vertebrate (developed nerve cord)