PHYLLUM ANNELIDA (15,000 spp) Segmented worms

2/3 marine worms (Class POLYCHAETES)

1/3 earthworms (Class OLIGOCHAETES) and leeches (Class HIRUDINEA)

Protostomes

Eucoelous

Complete Digestive Tract

All Organ systems present & well developed

Primitive Metamerism

Metamerism is great advance - lays ground work for specialized metamerism of arthropods.

Functional specialization seen in the two most successful phyla, Arthropoda & Chordata.

A. Coelome - highest stage of development

Hydrostatic pressure control by Metameres & Septa

B. Gastro-intestinal tract well differentiated

C. Increased cephalization

Specialized head region (Prostomium) with multiple differentiated organs (tentacles, palps, eyespots, etc.).

Brain (Ganglia) & 2 fused longitudinal ventral nerve cords.

D. Closed circulatory system of some complexity

Muscular aortic arches & Hemoglobin

E. Fleshy Parapoda (in polychaetes)

Locomotion & respiration

Suggestive of evolution toward paired limds

F. Well developed nephridia

Paired per body segment

Remove wastes from blood & coelome - consequence of closed circulatory system

G. Body wall - outer layer of circular muscle, inner of longitudinal muscle

H. Dioecious (polychaetes) and monoecious (oligochaetes & leeches)

Class POLYCHAETA ("many hairs", 11,500 spp)

Characterized by Parapodia

Notopodium

Aciculum

(chitinous rod) Neuropodium

Ecology correlated with structure/function relationships

Surface dwellers have well developed sensory structures on the head:

1-2 pairs of eyes

5 pairs of antennae

1 pair of palps

Primitive polychaetes were probably burrowers

Convergence with earthworms	Surface crawlers
< parapoda	> parapoda
< sensory organs	> sensory organs
Sedentary predators & deposit feeders	Most predatious, some scavengers & herbivores

Surface Crawlers - Errant & and pelagic polychaetes

Parapodia

Nervous System

Body wall musculature

Specialized jaw structures (chitinous teeth)

Gallery Dwellers - blood worms

Adapted for burrowing in sand & mud - mucous-lined burrows (< cave ins)

Prostomium

Parapodia

Septa & circular muscles (peristaltic movement)

Burrow ventilation & food gathering

Sedentary Burrowers (lugworm,"U" shaped burrow)

Tube-dewellers (Feather duster, blind burrow)

Class OLIGOCHAETA ("few hairs", 3,000 spp)

Freshwater & terrestrial

No sensory structures (e.g., eyes), simple

prostomium - light detectors on body segments

No specialized respiratory structures (gas exchange across most skin - sensitive to water-logged soils)

Detritivore - no specialized feeding structures

Calciferous Gland excretes excess Ca

Chloragogen Cells act as liver

Typhlosole > digestive surface area

Setae

No parapodia

Reproduction - monoecious - exchange sperm

Class HIRUDINEA ("leech", 500 spp)

Have a sucker composed of anterior segments about mouth & posterior segments form a larger sucker about anus

Reduced segmentation (Reductionism)

No parapodia or head appendages

Septa lost - move by looping

Strong longitudinal muscles - for looping

No setae

Hermaphodites

3/4 of leech species are ectoparasites (feed on blood)
1/4 of leech species are predacious carnivores of invertebrates

hirudin - salivary substance (anesthetic & anti-coaggulant of blood) has medical application (heparin)

Reproduction similar to oligochaetes (monoecious, clitellum & cocoon)