Phylum Annelida

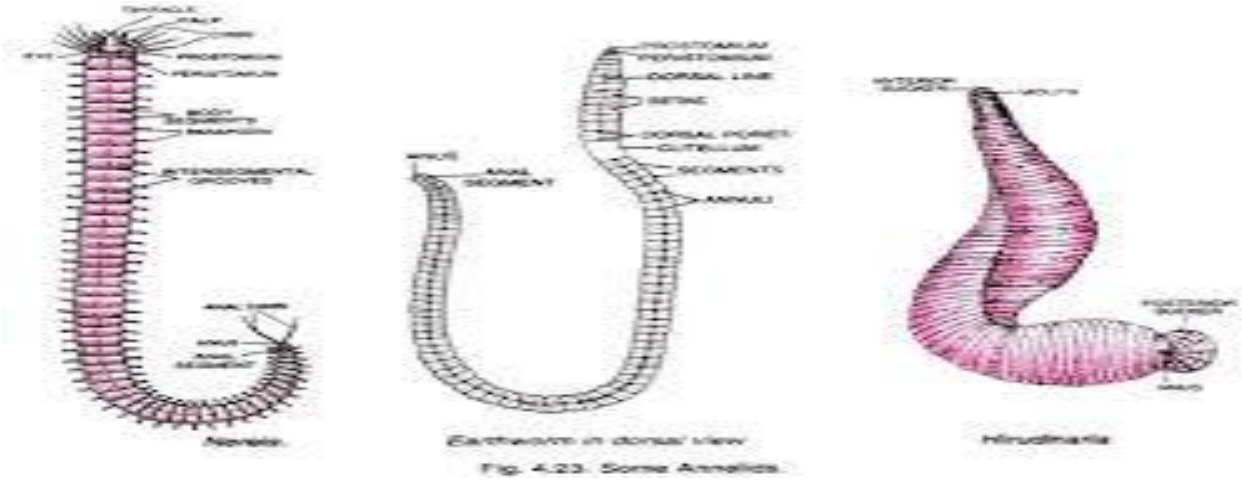
Introduction

Annelida includes Earthworms, Leeches, Blister worms etc. They are triploblastic, bilaterally symmetrical schizocoelomate protostomes. They exhibit metameric segmentation and true coelom. Their fluid filled coelom acts as hydrostatic skeleton and helps for burrowing and locomotion.

General Characters of Phylum Annelida

1. Cephalization is more pronounced with distinct head, bearing tentacles, eyes etc.
2. Annelida exhibits homonomous metamerism. Body is divided into linear series of similar segments, which are separate from one another externally by inter segmental grooves and internally by inter segmental septa.
3. In Annelida, body is divided into three regions: prostomium, trunk and pygidium. Trunk consists of a longitudinal series of similar segments. Growth results from the addition of new segments from teloblastic growth zone located just in front of pygidium.
4. Body wall consists of fibrous collagenous cuticle, epidermis, dermis, musculature and parietal peritoneum.
5. Chitinous bristles that project out from the epidermis are called setae. They provide grip on the substratum.
6. Body cavity is schizocoelom, formed by the splitting of mesodermal cells. Each segment has a pair of coelomic cavities separated from each other by dorsal and ventral mesenteries. Coelomic fluid acts as hydrostatic skeleton.
7. Alimentary canal is straight muscular type in Annelida. Digestive glands occur in the walls of the alimentary canal.

8. Exchange of respiratory gases occurs by diffusion through the body wall and gills. In many polychaetes parts of parapodia are modified into gills.
9. Blood vascular system is of closed type. In all non-chordates respiratory pigments if present, are dissolved in the blood plasma unlike chordates where they are retained in the blood corpuscles.
10. Excretory organs are segmentally arranged metanephridia. They open into coelom by nephrostome and to exterior by a nephridiopore.
11. Nervous system consists of circum-pharyngeal nerve ring and a ganglionated double ventral nerve cord.
12. Sensory structures include eyes and simple receptors like photoreceptors, chemoreceptors and mechanoreceptors.
13. Unisexual forms spawn gametes through metanephridia. Bisexual forms have gonoducts.
14. Cleavage is spiral and holoblastic in Annelida. Development is direct or indirect. Larva is trochophore.
15. During metamorphosis the larval episphere becomes the prostomium whereas the part posterior to the telotorch becomes the pygidium. Trunk segments arise from a growth zone anterior to the telotorch.



Annelida is divided into 3 classes: (i) Polychaeta (ii) Oligochaeta and (iii) Hirudinea.

Class 1- Polychaeta (Gr., **poly=**many**, chaeta=**bristles/hair)

- Chiefly marine, some freshwater.
- Carnivorous
- Body segmentation is internal and external.
- Head consists of prostomium and peristomium and bears eyes, tentacles cirri, and palps.
- Setae numerous on lateral parapodia.
- The clitellum is absent.
- Cirri or branchiae or both may be present for respiration.
- The coelom is spacious usually divided by intersegmental septa.
- The alimentary canal provided with the eversible buccal region and protrusible pharynx.
- The excretory organ is segmentally paired nephridia.
- Sexes separate. Gonads temporary and in many segments.
- Fertilization external.
- Asexual reproduction by lateral budding.
- Trochophore larva present.

Polychaeta divided into two subclasses, Errantia and sedentaria after Fauvel (1959). However, according to Dab (1963), this division is artificial and not a natural one.

Subclass 1. Errantia

- Free-swimming, crawling, burrowing or tube-dwelling and predatory polychaetes.
- Segmentation similar, except at anterior and posterior ends.
- The prostomium is distinct with sensory organs.
- Parapodia, provided with cirri, are equally developed throughout.
- Pharynx protrusible, enlarged and usually with jaws and teeth.
- **Examples:** ***Nereis***

Class 2- Oligochaeta (Gr., **oligos**=few+ **chaete=**hair**)**

- Mostly terrestrial or some freshwater forms.
- Body with conspicuous external and internal segmentation.
- Head indistinct, without sensory organs.
- Setae few, embedded in the skin.
- Parapodia absent.
- Glandular clitellum present for cocoon formation.
- The pharynx is not eversible and without jaws.
- Hermaphroditic i.e. sexes united.
- Testes anterior to ovaries.
- Development is direct. fertilization external (in cocoon); no larval stage.

.

Order 2. Neooligochaeta

- Usually terrestrial forms.
- The body is large and many segmented.
- Setae are managed in a lumbricine Manner.
- The gizzard is well developed.
- The clitellum is composed of two or more layers of cells and never begins before twelfth segments.
- Female genital aperture is always on the 14^{th} segment and the male pore lies a few segments behind them.
- Vasa differentia are elongated extending over 3 or 4 segments.
- Eyespots are never developed.
- Reproduction sexual. Asexual reproduction is not known.
- **Examples: *Pheretima, Eutypheus, Megascolex, Lumbricus*.**

Class 3- Hirudinea (L., **hirudo=** a leech**)**

- Mostly ectoparasitic, blood-sucking or carnivorous. Few are marine, freshwater or terrestrial.
- The body is elongated and usually flattened and dorso-ventrally or cylindrical.
- The body consists of a fixed number of segments (33). Each segment breaks up into 2 to 4 rings or annuli.
- Segmentation external without internal septa.
- Par podia and setae are absent.
- Both anterior and posterior ends of the body with ventrally situated suckers.
- The mouth opens on the ventral surface on anterior suckers, while anus opens dorsal to the posterior suckers.
- Coelom much reduced due to filling by botryoidal tissues, and form haemocoelomic sinuses.
- Hermaphrodite with one male and one female gonopore.
- Fertilization internal.
- Asexual reproduction is not known.

- Eggs are always laid in cocoons.
- Development is direct without a free-swimming larval stage.

Order 3. Gnathobdellia

- Freshwater and terrestrial form. Ectoparasitic blood-sucking leeches.
- Each typical body segment consists of 5 rings or annuli.
- Anterior suckers with 3 jaws, 1 median dorsal and 2 ventrolateral.
- The proboscis is absent.
- Blood is red-colored.
- Botryoidal tissues present.
- **Examples: *Hirudo, Hirudinaria, Haemadipsa, Herpobdella*.**