

## Classification of Phylum Annelida upto orders

Dr Anita Kumari  
Assistant Prof. (Guest faculty)  
L.S.College  
B.R.A.B.U., Muzaffarpur

The classification of Phylum Annelida is still unstable.  
**Before 1950 the class Annelida has been divided into 3 classes:**

- (i) Chaetopoda (the marine Polychaeta, terrestrial and fresh water Oligochaeta),
- (ii) Hirudinea (leeches) and
- (iii) Archiannelida.

This scheme was used by Parker and Haswell in 1940 .

**But in the VII<sup>th</sup> edition in 1972, Parker and Haswell , accepted Knox's scheme in which the Annelida has been divided into 4 classes such as:**

- (i) Polychaeta
- (ii) Archiannelida
- (iii) Oligochaeta and
- (iv) Hirudinea.

**Barnes (1987) divided Annelida into 3 classes:**

- (i) Polychaeta
- (ii) Oligochaeta and
- (iii) Hirudinea.

He included archiannelids in polychaeta.

## **Classification with Characters:**

### **Class 1. Polychaeta**

#### **Distribution:**

the polychaetes are really cosmopolitan and most of the species are common in the Indo-Pacific coasts. Many species have a worldwide distribution and the inter-tropical are the same in all the oceans. Thus the distribution of polychaeta is mainly limited by temperature.

#### **Characters:**

1. Body elongated, segmented with identical, cylindrical body segments.
2. Anterior end modified into a head.
3. A distinct head bears sensory appendages, such as eyes, antennae, cirri and palps.
4. Numerous setae on the trunk segments, hence called polychaeta.
5. Each body segment bears a pair of fleshy, lateral, paddle-like outgrowths, called parapodia, bearing numerous long setae in setigerous sacs. The parapodia act as locomotory and respiratory organs.
6. Parapodia basically biramous and supported by acicula.
7. Clitellum absent.

8. Alimentary canal is provided with an eversible buccal region and protrusible pharynx.

9. Highly vascularised gills are present in most large-sized polychaetes used for gas exchange.

**10. Brain complex is same than oligochaeta and divided into 3 regions:**

(i) Fore- brain

(ii) Mid-brain and

(iii) Hind-brain.

11. Protonephridia and Segmental metanephridial excretory systems is present.

12. Sexes separate in most.

13. Fertilization external.

14. A trochophore larval stage in the life cycle.

15. Exclusively marine, and mostly carnivorous but some are herbivorous.

**Examples:**

Aphrodite—sea mouse.

Phyllodoce

Syllis, Autolytus

Dendronereis, Nereis, —ragworms.

Chaetopterus(paddle worms), Arenicola)— lugworms.

## **Archiannelida (Gk. archi – first)**

### **Features:**

- (i) Heterogenous minor group.
- (ii) Body small, simple, elongated and vermiform.
- (iii) Simplified structure.
- (iv) External segmentations indistinct but internal segmentation present.
- (v) Setae and parapodia usually absent.
- (vi) Head bears sense organs,
- (vii) Unisexual or hermaphrodite.
- (viii) Blood vascular system simple or lacking.
- (ix) Larva trochophore.
- (x) Marine, brackish or freshwater species.

### **Examples:**

Nerilla, Troglachaetus, Polygordius, Protodrilus, Dinophilus, Trilobodrilus.

## **Class 2. Oligochaeta**

### **Habitat:**

Most species are found in freshwater or terrestrial habitats, a few species are marine.

### **Characters:**

1. Streamlined body with well-developed segmentation and a simple prostomium without sensory appendages, such as eyes, and tentacles.
2. Head indistinct.

3. Clitellum present.
4. Parapodia and cirri absent.
5. Setae less distributed along the body.
6. Usually no respiratory organs except a few species (e.g., *Dero*, *Branchiura*, etc.) which possess true gills. Gas exchange takes place by diffusion through the moist body wall.
7. Excretory system metanephridial type.
8. Brain simple type with ventral nerve cords.
9. They are hermaphrodites.
10. Fertilization (cross-fertilization) occurs externally.
11. Development direct and takes place within cocoon secreted by the clitellum.
12. Asexual reproduction usually common in freshwater species and involves by the transverse division of the adult body.
13. No larval stage in the life cycle.

**It includes 3 orders:**

**Order 1. Lumbriculida:**

- (i) 4 pairs setae in each segment.
- (ii) Clitellum consists of a single celled layer.
- (iii) Male and female gonopores in the clitellum.
- (iv) Male pores anterior to female pores.
- (v) Inhabitants of freshwater.

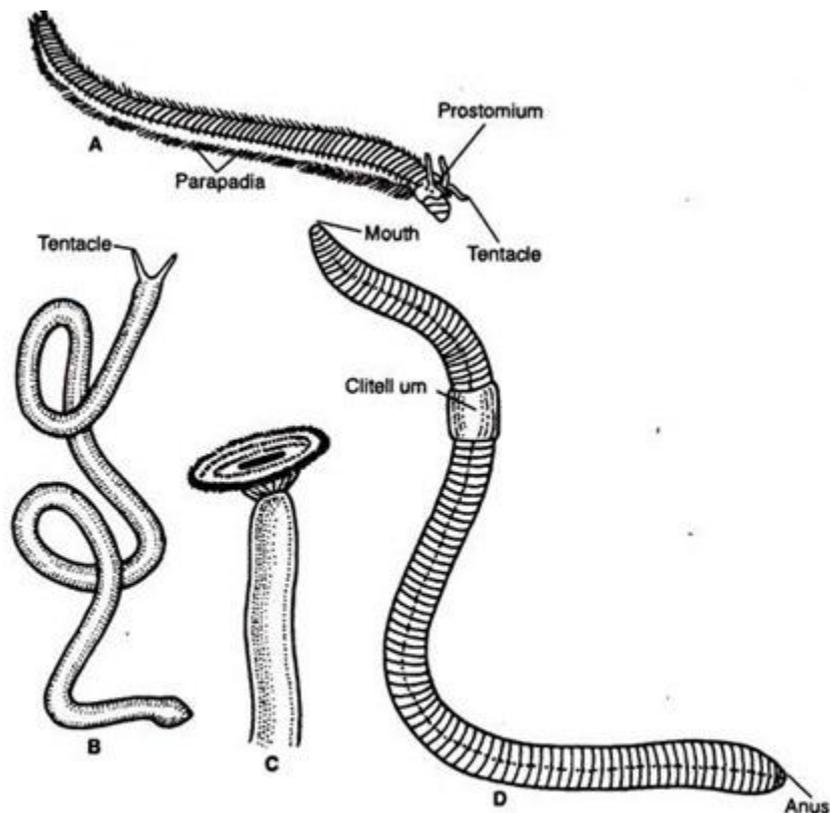


Fig. 17.44: A few members of Phylum Annelida (not drawn up to scale). A. *Nereis*. B. *Polygordius*. C. *Bispira* (tan worm). D. *Lumbricus* (British earthworm).

### Examples:

*Lumbriculus*, *Rhynchelmis*, *Styloscolex*.

### Order 2. Tubificida:

- (i) Setae present in bundles with two or more setae.
- (ii) Clitellum consists of a single-celled layer.
- (iii) Male and female gonopores in the clitellum.
- (iv) Male gonopore in front of the female gonopore.
- (v) One pair of testes followed by a pair of ovaries.
- (vi) Mostly aquatic.

### Examples:

*Tubifex*, *Branchiura*, *Nais*, *Dero*, *Chaetogaster*.

### **Order 3. Haplotaxida:**

(i) Setae simple or forked, and may be 4 or 8 or sometimes multiplied in a ring in each segment.

(ii) Clitellum composed of two or more layers of cells.

(iii) Female gonopores always on the 14th segment and male gonopore a few segments behind them.

(iv) One pair of testes or ovaries or both often absent.

(v) Aquatic or semi-terrestrial.

### **Examples:**

Lumbri- cus, Megascolides, Megascolex, Pheretima, Eudrilus.

### **Class 3. Hirudinea (L Hirudo = a leech):**

#### **Habit and Habitat:**

They are either free living or permanently or intermittently ectoparasites. In freshwater large number of species prey on invertebrates rather than blood sucking species but most marine species are ectoparasites on fishes.

#### **Characters:**

1. Body consists of definite and limited number of segments.
2. Trunk consists of 21 segments with preclitellar region, clitellum and post clitellar region.
3. Clitellum includes 3 segments and never conspicuous except reproductive period.
4. Segments are marked externally by secondary rings or annuli.

5. Usually with a small suctorial anterior sucker and a large powerful posterior sucker.
6. Parapodia and head appendages absent.
7. Coelom generally reduced by the presence of connective tissue, called botryoidal tissue, and muscles.
8. Both sinuses and muscular blood vessels present.
9. Excretory organs include segmentally arranged 10 to 17 pairs of metanephria.
10. Asexual reproduction absent.
11. Hermaphrodite.
12. Gonads and gonoducts restricted to anterior few segments.
13. Fertilization internal.
14. Development direct and takes place within cocoons secreted by clitellum.

**It contains 3 orders:**

**Order 1. Acanthobdellida:**

(i) Short proboscis.

(ii) Anterior sucker absent but posterior sucker well developed.

(iii) Setae present in the anterior five segments (an exceptional case) and a compartmented coelom.

(iv) Parasite on salmonid fish.

A primitive order which forms a connecting link between Oligochaeta and Hirudinea. This order contains a single genus with a single species.

**Example:**

Acanthobdella.

**Order 2. Rhynchobdellida:**

(i) Anterior part of the body can be protruded or retracted as proboscis.

(ii) Anterior sucker present.

(iii) Jaw and setae absent.

(iv) Each typical body segment contains 3, 6 or 12 annuli.

(v) Colourless blood.

(vi) Coelom reduced to sinuses without botryoidal tissues.

(vii) No penis.

(viii) All are aquatic, ectoparasites of both invertebrates and vertebrates in fresh- Water and marine habitats.

**Examples:**

Glossiphonia (parasite on aquatic snails); Piscicola, Pontobdella (parasite on fish or other aquatic vertebrates); Ozobranchus (parasite on turtles and crocodiles).

**Order 3. Arhynchobdellida:**

(i) Non-reversible pharynx present.

(ii) Anterior sucker with 3 pairs of jaws (e.g., Hirudinidae) or jaws absent (e.g., Erpobdellidae).

(iii) Each typical body segment contains 5 annuli.

- (iv) Blood red coloured.
- (v) Botryoidal tissue present.
- (vi) Fertilization by the insertion of penis.
- (vii) Aquatic and terrestrial leeches.

**Examples:**

Hirudo (the typical—leech which is parasite on vertebrates), Aulostoma (horse leech, free-living and carnivorous), Hirudinaria (H. granulata, cattle leech), Haemadipsa, Phytobdella (terrestrial leeches), Erpobdella (worm leeches), Dina.