

Chapter 9 Phylum Annelida

Annelids, or segmented worms, are different from round worms and horse-hair worms. They have a series of repeating segments. The serial repetition of segments and organ systems is called **metameric segmentation**, and is one of the main characters of this phylum. Members include polychaetes, oligochaetes and leeches.

General structure and function

Annelid worms have a soft body wall which contains both circular and longitudinal muscles. These muscular layers are covered with an epidermis and a thin layer of nonchitinous cuticle (Fig. 1). Annelids have a **true coelom**, and it is divided by septae. The coelom of polychaetes and oligochaetes is filled with fluid and functions as a hydrostatic skeleton. Alternating waves of contraction by the longitudinal and circular muscles result in a peristaltic contraction of the body wall. This movement aids polychaetes and oligochaetes in locomotion and burrowing. In contrast, leeches swim by undulating their bodies.

Annelids have a closed circulatory system, and gas exchange occurs through the moist skin, gills or fleshy appendages called parapodia. The digestive system is complete and not segmentally arranged. The mouth opens on the peristomium and an anus opens at the posterior end. A pair of nephridia in almost all segments functions in excretion; however, some wastes are excreted directly across the epidermis.

Most polychaetes are dioecious, and have sexual reproduction and trochophore larvae. Oligochaetes and leeches are hermaphroditic and have cross-fertilization. Larvae develop in external cocoons.

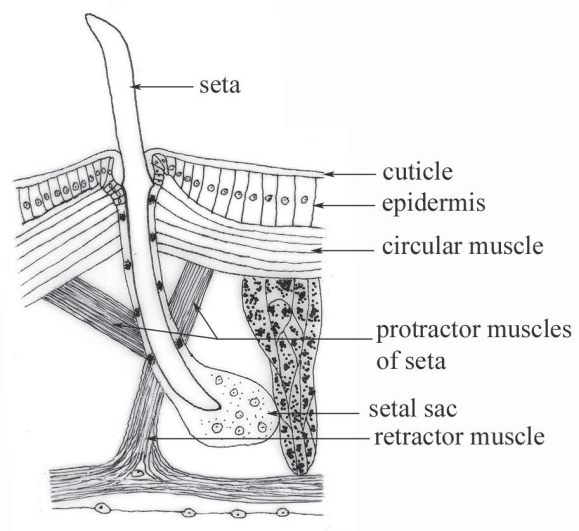


Fig. 1 Transverse section of body wall of the earthworm (redrawn from Barnes, 1963, fig. 11-38B)

Classification

Annelids are classified into 3 classes : Polychaeta, Oligochaeta and Hirudinea. A few polychaetes, or bristleworms, are freshwater but almost all oligochaetes (earthworms and relatives) and hirudines (leeches) are freshwater. Freshwater oligochaetes are small, usually translucent and thread-like. The family Tubificidae is common, especially in muddy sediments where there are high levels of organic contamination. It is an indicator of poor water quality. Leeches have suckers at the anterior and posterior ends of the body. They often are found clinging under stones or plant leaves or burrowing in soft sediments. Leeches feed on small invertebrates or suck the blood of vertebrates. The key to the classes of freshwater annelids is available in Chapter 1. A key to the common families of freshwater leeches is as follows.

KEY TO FAMILIES OF FRESHWATER LEECHES

- 1 Anterior sucker with a very distinct complete rim (Fig. 2) ; four eyes, parasites of fishes PISCICOLIDAE (fish-leeches)
- 1' Anterior sucker with part of the rim not distinct from body (Fig. 3) two to ten eyes
 - 2(1') Anterior sucker indistinct; mouth large; body flattened cylindrical shaped (Fig. 5a); 8-10 eyes 3
 - 2' Anterior sucker fairly distinct; mouth a small pore in the central of the sucker region; body rose apple-shaped in outline; 2-8 eyes (Fig. 3) GLOSSIPHONIIDAE
 - 3(2) Eight eyes; small or medium size leeches without jaws (Fig. 4).....ERPOBDELLIDAE
 - 3' Ten eyes; large leeches with strong jaws (Fig. 5).....HIRUDINIDAE

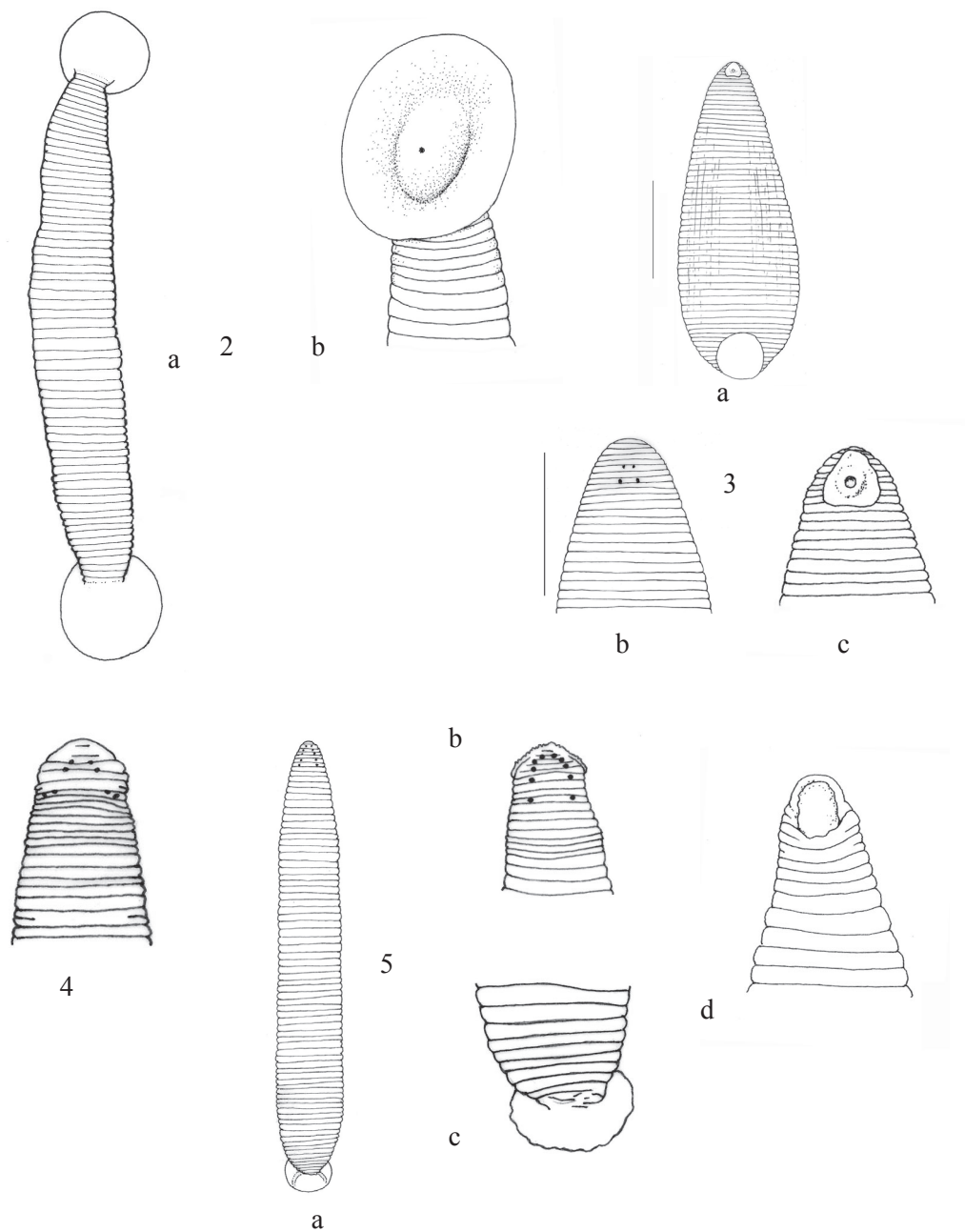


Fig. 2-5 2. Dorsal view (a) and anterior sucker (b) of Piscicolidae (modified from Pennak, 1989, fig. 36C); 3. Ventral view (a), dorsal view (b) and ventral view of anterior (c) of Glossiphoniidae; 4. Dorsal view of anterior of Erpobdellidae (redrawn from Pennak, 1989, fig. 33C); 5. Dorsal view (a), dorsal view of anterior (b), dorsal view of posterior (c) and anteroventral view (d) of Hirudinidae (redrawn from Pennak, 1989, fig. 27, 33B, 33L). Scale = 1 mm.

