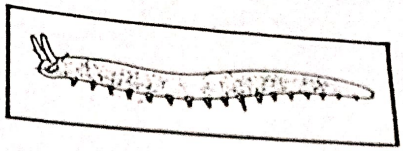

Peripatus

From the standpoint of phylogenetic relationship between two taxonomic groups, few animals are more interesting than the small caterpillar-like form, called *Peripatus*. This animal displays some of the characteristics of both the annelid worms as well as arthropods, besides its own typical features. Owing to its resemblance with two different phyla, *Peripatus* is often referred to as the connecting link between them.

Peripatus and related animals belong to the phylum *Onychophora* (Gr., *onyx*, claw+*pherein*, to bear), which is conventionally classified with Arthropoda as one of its classes. But the modern system of animal classification has given to it the status of an independent phylum. There are about 70 species in this phylum belonging to a few genera or possibly to one genus, *Peripatus*.

Geographical Distribution

Peripatus exhibits discontinuous distribution with species scattered in most of the warmer parts the world—Africa, Australia, New Zealand, entral America, Mexico, West Indies, Malaya Archipelago, India and other localities. Some common forms of *Peripatus* are —

(1) *Opisthopatus*—Chile and South Africa.
(2) *Mesoperipatus*—Congo and Caribbean Islands.
(3) *Peripatopsis*—South Africa.
(4) *Ooperipatus*—Australia.

Habits and Habitat

Peripatus is a terrestrial animal, living in moist places, in crevices of rocks, under stones, log and bark, and other dark and damp places wher it is protected both from loss of water and al from the predatory arthropods. It is nocturnal nature and predaceous and carnivorous in feed habit.

External Morphology

Body of *Peripatus* is elongated, cylindrical bilaterally symmetrical, measuring between cm in length. The external segmentati unclear and the legs, which number from 43 pairs, are unjointed. Each leg is a protuberance ending in two claws and

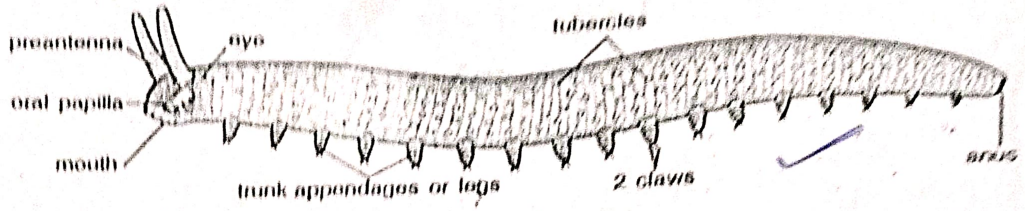

Fig. 1. *Peripatus.* External features in lateral view.

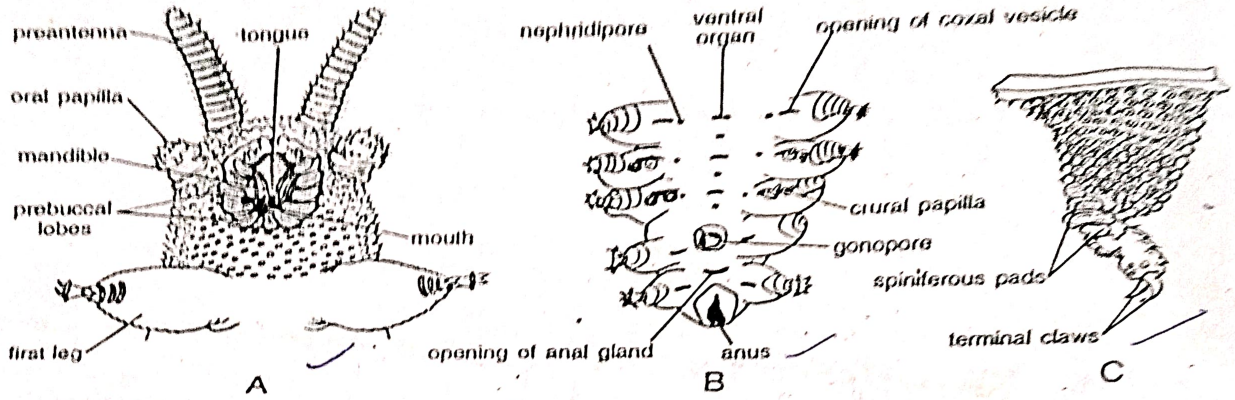

Fig. 2. *Peripatus.* A—Anterior end in ventral view. B—Posterior end in ventral view. C—A leg.

with 3 to 6 pads on ventral side which serve as walking soles which contact the substratum. That is why they are also called walking worms. Body is actually lifted off the ground by the legs which move in a series of steps. Skin surfaced with a thin cuticle is soft and velvety and thrown into transverse ridges bearing numerous conical *papillae* or *tubercles* armed with chitinous spines. Below the cuticle are the typical layers of muscles and connective tissue of a worm like body. Surprisingly the muscle plays no role in the process of locomotion which is carried out by the movement of appendages alone. The muscle of body wall takes part in changes of length and shape of the body (Sidnic and Manton). Anterior end which is not differentiated as a distinct head, bears a pair of dorsal eyes, a pair of *pre-antennae* or *preoral antennae,* a pair of slime-secreting *oral papillae,* and a mid-ventral mouth with a pair of chitinous jaws. Both the jaws and the oral papillae are modified legs. The unjointed legs are short and stumpy and each ends in two claws. The anus lies at the posterior end, slightly towards the ventral side, and the genital aperture is located in front of the anus. *Peripatus* shows sexual dimorphism; males are smaller than females.

Anatomical Features

(1) The body wall is dermo-muscular, consisting of cuticle, epidermis, dermis, and striped circular and longitudinal muscles.

(2) The coelom is in the form of small cavities around gonads and metanephridia.

(3) The body cavity is a haemocoel, lined with epithelium.

(4) A pair of *slime glands* are located, one on either side of the body cavity. These open on the oral papillae and secrete an adhesive slime for entangling the prey.

(5) The mouth leads into the alimentary canal, which comprises of a tongue with rows of sensory spines, muscular pharynx into which opens a pair of large salivary glands, short foregut or oesophagus, long midgut or

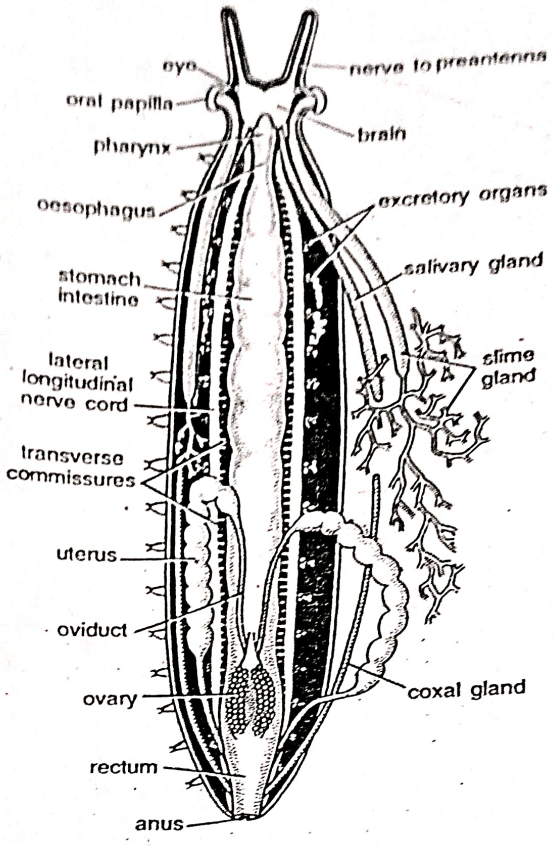

Fig. 3. *Peripatus*. Internal structures.

stomach-intestine and short hind gut or rectum.

(6) The respiratory organs are unbranched tracheae, communicating to outside through minute spiracles.

(7) The excretory organs are coxal glands, one pair in each segment, opening at the base of the legs.

(8) A dorsal tubular contractile heart lies within the pericardial cavity.

(9) The nervous system consists of a pair of suprapharyngeal ganglia or brain with two circumpharyngeal connectives and a pair of widely separated lateral longitudinal nerve cords connected together by transverse commissures. Ganglia on the cords are indistinct.

(10) Sensory organs are a pair of eyes near the base of the antennae, taste spines on the lips and preoral cavity and tactile spines on the surface tubercles.

(11) Female reproductive organs include a pair of ovaries, a pair of oviducts and a pair of beaded uteri. The uteri join to open to outside through a vaginal opening. The male reproductive system has paired testes, seminal vesicles, vasa deferentia and genital openings.

(12) Fertilization is internal. The female produces about 30 or more young in a year. The young resembles the adult.

Affinities of *Peripatus*

Peripatus has no economic importance; but it is zoologically very interesting, because it exhibits both arthropod and annelid characteristics as well as peculiarities of its own.

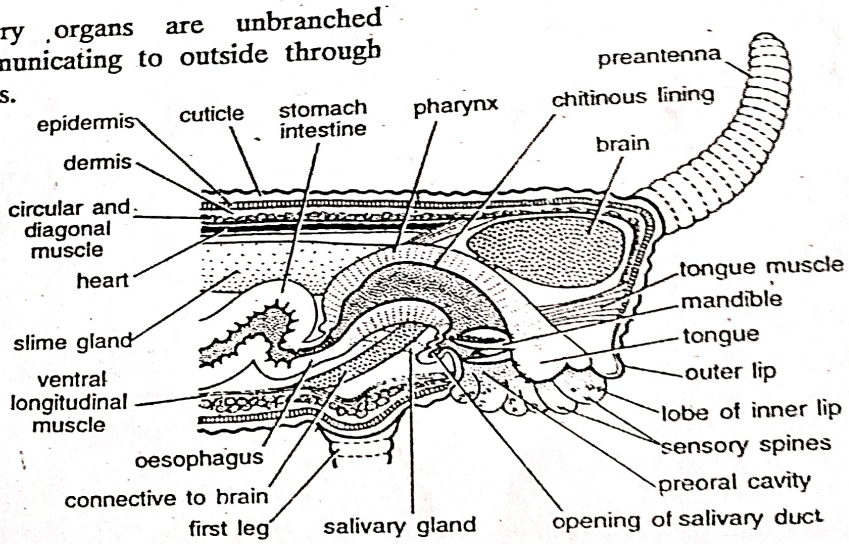

Fig. 4. *Peripatus*. Anterior end in sectional view.

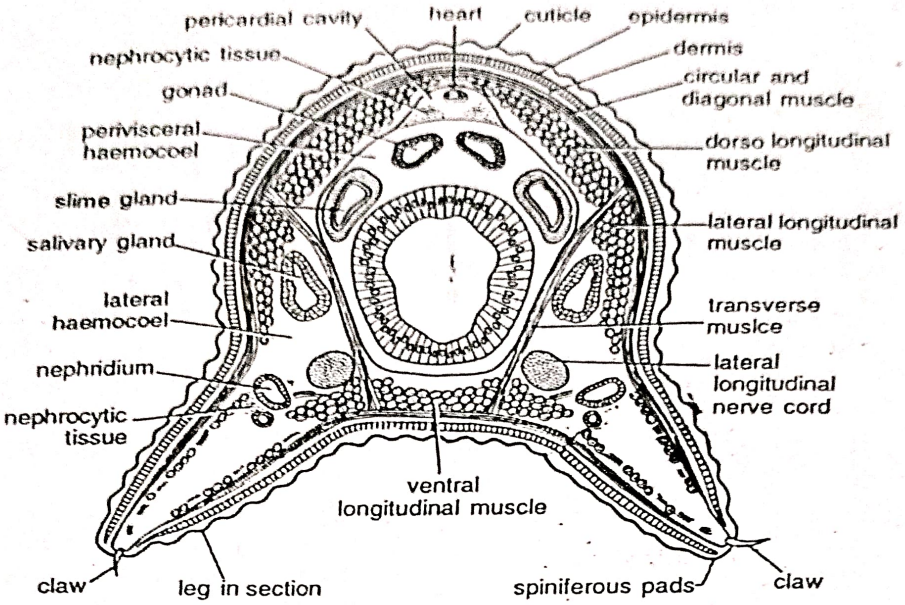

Fig. 5. *Peripatus.* Body in T.S.

[I] Annelidan characteristics

(1) Vermifrom body with truncated extremities.
(2) Absence of a true head.
(3) Dermo-muscular body-wall, consisting of a thin flexible cuticle and underlying circular and longitudinal muscles.
(4) Locomotion slow and by peristalsis as in an earthworm.
(5) Structure of the simple eyes as in polychaetes.
(6) Unjointed, hollow, stumpy appendages of the nature of extensions of the body-wall, like parapodia of Polychaeta.
(7) Simple, straight alimentary canal with terminal mouth and anus.
(8) Segmentally arranged paired nephridia.
(9) Slime and coxal glands correspond with similar glands of Chaetopoda.
(10) Presence of cilia in the excretory and reproductive ducts.

[II] Arthropodan characteristics

(1) Presence of antennae.
(2) Jaws are modified appendages provided with striped muscles.
3) Locomotion by definite legs, having definite musculature and provided with claws.
4) Cuticle has a thin deposit of chitin, like that of arthropods.
(5) Body-cavity is a haemocoel.
(6) Coelom reduced to small cavities that surround the excretory and reproductive ducts.
(7) Peculiar salivary glands, supposed to be modified nephridia.
(8) Dorsal tubular heart with lateral ostia.
(9) Presence of a tracheal respiratory system.
(10) Brain is large and typically arthropodan.
(11) General structure of the reproductive organs and development mainly arthropodan.

[III] Onychophoran characteristics

Following features are peculiar to *Peripatus*, in which they differ from other phyla :

(1) Body shows no or indistinct external segmentation.
(2) Texture of skin. A rough cuticle covered with numerous velvety processes not known in other phyla.
(3) Antennae not homologous to the antennae of other arthropods.
(4) Three-segmented head of *Peripatus* shows a condition mid-way between that of Annelida and Arthropoda.
(5) Restriction of jaws to a single pair. Movement of jaws is antero-posterior.
(6) Presence of non-jointed legs with claws.