

Phylum – ONYCHOPHORA

(Peripatus)

Peripatus is a living fossil invertebrate belonging to Class Onychophora that evolved in Cambrian period, about 570 million years ago. The genus occurs in the tropical forests of Africa, Asia, South America and Australia, showing discontinuous distribution. It shows anatomical features similar to Annelida as well as Arthropoda. The genus was erected by Lansdown Guilding (1826). There are about 70 species in the world.

Peripatus is a predatory animal that feeds on insects, spiders, isopods and similar small animals, which it hunts by immobilizing them with a jet of glue-like substance secreted by a pair of papillae on the head. This glue is extremely sticky and surrounds the prey from all sides. *Peripatus* then bites the prey to inject the digestive saliva in its body so that its tissue are liquefied and can be sucked with ease. Velvet worms are themselves preyed upon by birds, lizards and rodents.

Peripatus is a rare and nocturnal animal that avoids brightness. They can be found in damp and secluded places such as under the stones and rotting wood, under the bark of fallen logs and in leaf litter. They have a life span of about 6 years.

External Morphology

Peripatus is a worm-like animal, 2-15 cm in length, bluish, greenish, grey or brown in colour and having velvety skin because of which they are called “Velvet worms”. Body is unsegmented but there are wrinkles and **annulations** on the body and paired legs throughout the length of the body. Head bears one pair of segmented **preantennae** and one pair of simple eyes. One pair of **oral papillae** is in the form of prominent protuberances on the false head, which are used to produce a jet of sticky material that is thrown on the hapless prey that gets entangled in it. Mouth parts are biting and chewing type of mandibles that are used to tear the body of prey. Skin is covered with a layer of **cuticle** and bears small dense tubercles or papillae which give it a velvety appearance.

Leg is a hollow protuberance from the body, covered with conical papillae. It has a claw-bearing **foot** that is attached to the leg by 3-6 **spiniferouspads**. Locomotion takes place by peristaltic waves passing from anterior to posterior end of the body.

Digestive System

Peripatus is a carnivore feeding on snails, insects, worms etc. Alimentary canal is straight tube almost similar to the Polychaete worms, with mouth on the anterior end and terminal anus on the posterior end. Mouth parts are modified for biting and tearing prey. One pair of **salivaryglands** open into the pharynx and saliva contains proteolytic enzymes. There is no distinction between the stomach and intestine and the rectum is a small dilation on the posterior end. Digestive juices are secreted by the lining of intestine, where most of the digestion and absorption takes place.

Respiratory System

They are air breathing animals. Respiration is performed by the **trachealsystem**, similar to insects. There are paired **spiracles** on the lateral sides throughout the length of the body through which the air enters into the tracheal tubes.

Circulatory System

Circulatory system is open type having a **haemocoel** that is more or less similar to the Arthropods. There are lacunae and sinuses and a long dorsal tubular **heart** that bears ostia. There is no respiratory pigment in the blood.

Excretory System

Excretory organs are **nephridia** which are segmentally arranged coiled tubules, one pair on each segment. In addition to nephridia, there are **Coxalglands** or crural glands which open on the ventral side of the leg.

Nervous System

Nervous system is unique and has a large bilobed **cerebral ganglion** on the dorsal side of the pharynx. **Circumpharyngeal connectives** run on both the sides of pharynx and join on the ventral side, but there is no ganglion on the ventral side of the pharynx. There are two **nervechords** that run on the ventrolateral side throughout the length of body and then join each other on the posterior end. These nerve cords are connected together by transverse **commissures** at regular intervals. This type of nervous system is found in molluscs and is not a feature found either in Annelida or Arthropoda.

Sense Organs

There is a pair of simple **eyes** on the head, similar to polychaete eyes. There are no compound eyes. A pair of **antennae** on the head is prominent sensory organ that performs many sensory functions as happens in arthropods. Skin appears to be sensitive to touch as there are sensory spines on the **papillae**, which are densely located on the skin.

Reproductive System

Sexes are separate. Males possess a pair of testes, whose vasa deferentia unite to form common **vas deferens** that opens into the **genital atrium**. Males pack their sperms in **spermatophores**, which are attached on the genital atrium of the female after copulation. Fertilization is internal.

Female possesses a pair of ovaries that are joined on the anterior as well as on the posterior side. The ciliated oviduct opens into the large beaded uterus that opens into the genital atrium. The anterior side of genital atrium possesses a **seminal receptacle** that is used to store sperms after copulation. Females are either viviparous or lay shelled eggs.

Origin of Onychophora is obscure. The embryonic development is similar to clitellate annelids.

Onychophora has many characters of Annelida, particularly its general body organisation. But it also exhibits many important features that take it closer to Arthropods. Hence this

animal has been assigned to an independent status of phylum between Annelida and Arthropoda.