**Lecture No.13 PARASITOLOGY DR. Raad H.H.**

 **Phylum: Annelida Lamarck, 1809introduction:**

The **annelids** (also called **Ringed Worm**), collectively called **Annelida** (from [French](http://en.wikipedia.org/wiki/French_language) *annelés* "ringed ones", ultimately from [Latin](http://en.wikipedia.org/wiki/Latin) *anellus* "little ring", are a large [phylum](http://en.wikipedia.org/wiki/Phylum) of segmented [worms](http://en.wikipedia.org/wiki/Worm), with over 17,000 modern species including [**ragworms**](http://en.wikipedia.org/wiki/Ragworm)**,** [**earthworms**](http://en.wikipedia.org/wiki/Earthworm) **and** [**leeches**](http://en.wikipedia.org/wiki/Leech).

They are found in marine environments, in freshwater, and in moist terrestrial environments. Although most textbooks still use the old division into [**polychaetes**](http://en.wikipedia.org/wiki/Polychaete)(almost all **marine),** [**oligochaetes**](http://en.wikipedia.org/wiki/Oligochaete) (which include **earthworms**) and **leech-like species**, research since 1997 has radically changed in new scheme, viewing leeches as a sub-group of oligochaetes and then oligochaetes as a sub-group of polychaetes.

The basic annelid form consists of **multiple** [**segments**](http://en.wikipedia.org/wiki/Segmentation_%28biology%29), each of which has the same sets of organs and, in most polychaetes, a pair of [**parapodia**](http://en.wikipedia.org/wiki/Parapodia)that many species use for [locomotion](http://en.wikipedia.org/wiki/Animal_locomotion). [**Septa**](http://en.wikipedia.org/wiki/Septum) separate the segments of many species, but are poorly-defined or absent in some, The septa of these species also enable them to change the shapes of individual segments, which facilitates movement by [**peristalsis**](http://en.wikipedia.org/wiki/Peristalsis) **("ripples"** that pass along the body) or by [**undulations**](http://en.wikipedia.org/wiki/Lateral_undulation) that improve the effectiveness of the parapodia.

**Oligochaetes** are full [**hermaphrodites**](http://en.wikipedia.org/wiki/Hermaphrodite) and produce a ring-like [**cocoon**](http://en.wikipedia.org/wiki/Pupa) round their bodies, in which the eggs and hatchlings are nourished until they are ready to emerge.

Annelids **creep** along or burrow by coordinating **two sets of muscles**. One set allows them to expand and anchor one part of their body while the other set contracts and pushes the rest of the body forward into the sediment. By alternating these two muscle sets, the worm can powerfully inch forward.

There are over **17,000** living annelid **species**, ranging in size from microscopic to the "Australian [giant Gippsland earthworm](http://en.wikipedia.org/wiki/Giant_Gippsland_earthworm)", which can grow up to 3 metres (9.8 ft) long. Although research since 1997 has radically changed scientists' views about the evolutionary family tree of the annelids, most textbooks use the **new classification** into the **following sub- classes (groups) :**

1. [**Polychaetes**](http://en.wikipedia.org/wiki/Polychaete) (about 12,000 species). worms like **Nereis** .As their name suggests, they have multiple [**chetae**](http://en.wikipedia.org/wiki/Cheta) **("hairs") per segment**. Polychaetes have [**parapodia**](http://en.wikipedia.org/wiki/Parapodia) that function as limbs, and **nuchal** organs ("nuchal" means "on the **neck**") that are thought to be [chemosensors](http://en.wikipedia.org/wiki/Chemosensor). Most are marine animals, although a few species live in fresh water and even fewer on land.
* Prostomium 
* Peristomium
* **O** Mouth
* Growth zone
* Pygidium

 **O** Anus

1. [**Clitellates**](http://en.wikipedia.org/wiki/Clitellate) (about 5,000 species). These have **few or no chetae** per segment, and **no nuchal organs or parapodia**. However, they have a unique reproductive organ, **the ring-shaped** [**clitellum**](http://en.wikipedia.org/wiki/Clitellum) **("**[**pack saddle**](http://en.wikipedia.org/wiki/Pack_saddle)**") round their bodies**, which produces a [cocoon](http://en.wikipedia.org/wiki/Pupa) that stores and nourishes fertilized eggs until they hatch. **The clitellates are sub-divided into** :
	1. [**Oligochaetes**](http://en.wikipedia.org/wiki/Oligochaete) ("**with few hairs**"), which includes [**earthworms**](http://en.wikipedia.org/wiki/Earthworms)**. *"Lumbricus terrestris*** Oligochaetes have a sticky pad in the roof of the mouth. Most are burrowers that feed on wholly or partly decomposed [organic materials](http://en.wikipedia.org/wiki/Organic_material).
	2. [**Hirudinea**](http://en.wikipedia.org/wiki/Hirudinea), whose name means "[**leech**](http://en.wikipedia.org/wiki/Leech)**-shaped**" and whose best known members are leeches. Marine species are mostly blood-sucking [parasites](http://en.wikipedia.org/wiki/Parasite), mainly on fish, while most freshwater species are predators **They have suckers at both ends of their bodies,** and use these to move rather like [inchworms](http://en.wikipedia.org/wiki/Geometer_moth) ( caterpillars moth larvae).

**Characters of Leeches**

* The **largest** leech recorded till date measures about **16** **inch** in length. On an average, the size of leeches is between 7 - 80 mm.
* Like earthworms, leeches are **hermaphrodites**, meaning that a single leech has both male and female sexual organs.
* Leeches **bite** is **painless**, which is due to the anesthetic present in the saliva secretion of leeches.
* Leeches have the ability to **feed** in large amounts (about **5 times** **their body weight**) and store nutrients for future use.
* Many leech species can survive for about one year after having a blood meal. They use the preserve food for survival.
* Some species (e.g hirudo) lays their young ones in cocoons, while others (e.g. Amazon leech) keep their babies (as much as 300) in the stomach.
* Accounts of the use of [**leeches**](http://en.wikipedia.org/wiki/Leech)for the medically suspected practise of [**blood-letting**](http://en.wikipedia.org/wiki/Blood-letting) have come from China around 30 AD, India around 200 AD, ancient Rome around 50 AD and later throughout Europe. In the 19th century medical demand for leeches was so high that some areas' stocks were exhausted and other regions imposed restrictions or bans on exports, and "[***Hirudo medicinalis***](http://en.wikipedia.org/wiki/Hirudo_medicinalis) **"**is treated as an **endangered species** by both [IUCN](http://en.wikipedia.org/wiki/IUCN) and [CITES](http://en.wikipedia.org/wiki/CITES). More recently leeches have been used to assist in [**microsurgery**](http://en.wikipedia.org/wiki/Microsurgery), and their [saliva](http://en.wikipedia.org/wiki/Saliva) has provided [anti-inflammatory](http://en.wikipedia.org/wiki/Anti-inflammatory) compounds and several important [anticoagulants](http://en.wikipedia.org/wiki/Anticoagulant), one of which also prevents [tumors](http://en.wikipedia.org/wiki/Tumor) from [spreading](http://en.wikipedia.org/wiki/Metastasis).

