

Parasitic Helminths
and
Arthropod Agents and
Vectors of Diseases

Parasitic Helminths and Arthropod Agents and Vectors of Diseases

Objectives:

By the end of this lecture the student should be able to :

- Name the three main groups of parasitic helminths and their characteristic morphological features .
- Describe the life cycle of *Ascaris lumbricoides* as an example of parasitic heminth .
- Discuss the role of arthropods as agents and as vectors of diseases in humans.
- Give examples of the main arthropod vectors of diseases.

Classification of Parasites

Protozoa	Helminths
Unicellular Single cell for all function	Mulicellular Specialized cells
Amoebae: move by psudobodia. Flagellates: move by flagella. Ciliates : move by cilia Apicomplexa (sporozoa) Tissue parasites	Round worms (Nematodes) cylindrical, unsegmented Flat worms 1-Trematodes: leaf-like, unsegmented. 2-Cestodes: tape-like, segmented

Location of helminths in the body:

- Intestinal helminths:
- Tissue helminths:

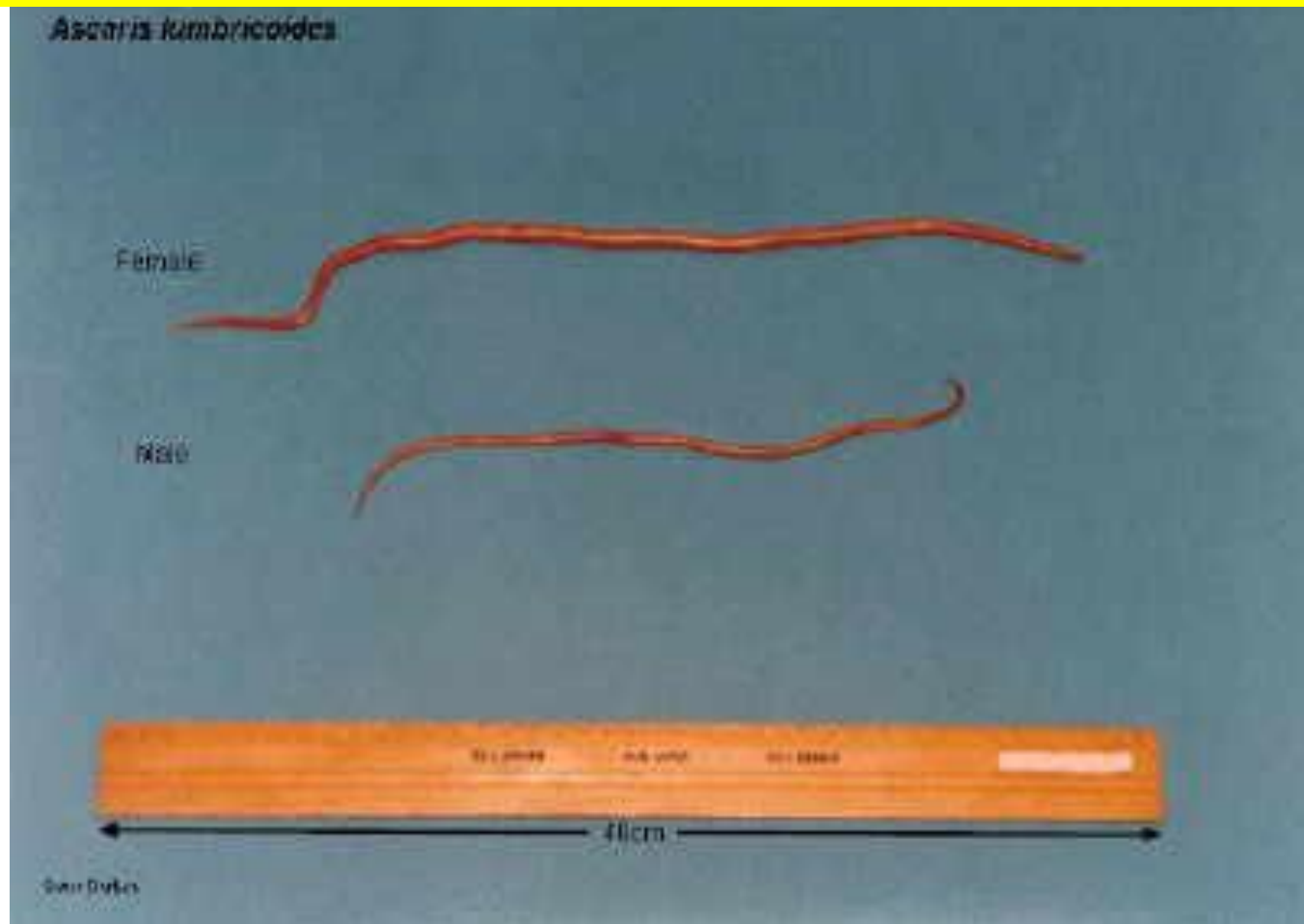
Nematodes

General features:

1. **Elongated worm, cylindrical, unsegmented and tapering at both ends.**
2. **Variable in size, measure <1 cm to about 100cm.**
3. **Sex separate and male is smaller than female**



Ascaris lumbricoides (roundworm)



Ascaris lumbricoides (roundworm)

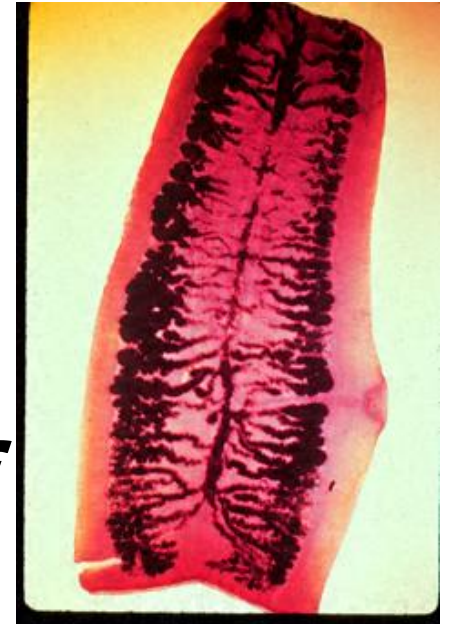
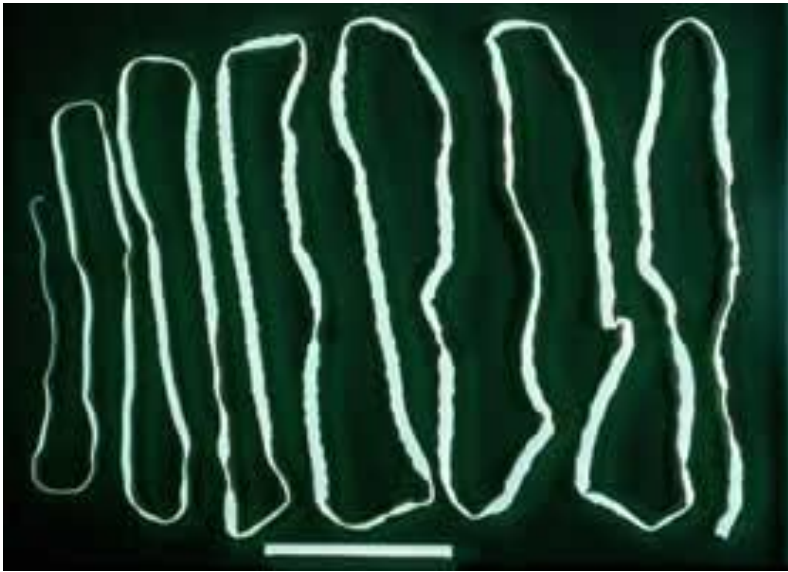
The commonest human helminthes infection.

- Found in **jejunum** and upper part of **ileum**.
- Female \pm **20** cm longer than male \pm **10** cm
- Feed on semi digested food.





The Trematodes

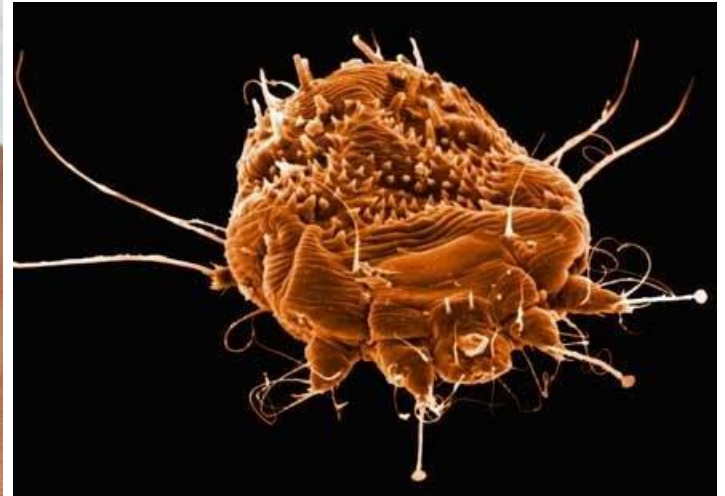


***Taenia saginata* Example of a tapeworm**

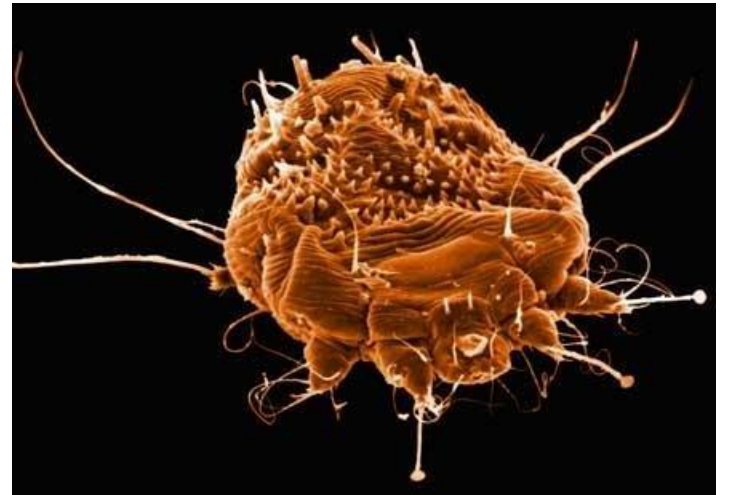
MEDICAL IMPORTANCE OF ARTHROPODS

- **1) As aetiological agents (causes) of diseases.**
 - Tissue damage
 - Induction of hypersensitivity reactions.
 - Injection of poisons
 - Entomophobia (acarophobia)
- **2) As vectors of diseases:**
 - **I: Mechanical transmission - simple carriage of pathogens.**
 - **II: Biological transmission:**
 - - cyclical
 - - propagative
 - - cyclopropagative
 - **III: Transovarian transmission**

Scabies



Scabies



ARTHROPODS OF MEDICAL IMPORTANCE

Class <i>Insecta</i> الحشرات	Class <i>Arachnida</i> العنكب	Class القشريات <i>Crustacea</i>
<ul style="list-style-type: none"> ● Muscid flies: housefly, Tsetse fly ● Myiasis-producing flies . ● Mosquitoes البعوض: <i>Anopheles, Aedes Culex</i> ● Sandfly ذباب الرمل (<i>Phlebotomus</i>) ● Black fly (<i>Simulium</i>) ● Fleas البراغيث ● Lice (<i>Pediculus, Phthirus</i>) القمل ● Bugs: <i>Cimex, Triatoma</i> البق ● Bees النحل 	<ul style="list-style-type: none"> ● Scorpions العقارب ● Spiders العنكب ● Ticks: القراد hard, soft ● Mites السوس -<i>Sarcoptes scabiei</i>, -dust mites 	<ul style="list-style-type: none"> ● Water flea (<i>Cyclops</i>)

Important arthropod vectors for human diseases

House fly (<i>Musca domestica</i>)	Mechanical transmission of many viruses, bacteria and parasites.
Mosquitoes البعوض	Anopheles :malaria filariasis Culex: filariasis, viruses Aedes: yellow fever, dengue fever, Rift Valley Fever
Lice القمل	Body louse: vector for: Relapsing fever, typhus and trench fever.
Fleas البراغيث	Rat flea is vector for plague due to Yersinia pestis.
Ticks القراد	Soft ticks , some are vectors for : Borrelia duttoni Hard ticks Include vectors for Babesiosis (protozoa), Q fever, and Rocky mountain spotted fever :
Tse tse fly (<i>Glossina</i>) ذبابة التسي	Vector for African Trypanosomiasis (African sleeping sickness)
Black fly (<i>Simulium</i>) الذبابة السوداء	Vector for Onchocerca (river blindness)
Sand fly (<i>Phlebotomus</i>) ذبابة الرمل	Vectors for leishmania and sandfly fever virus.
Cyclops	Vector for Dracunculus medinensis

LICE

Louse(singular) , Lice (plural)

Pediculus humanus



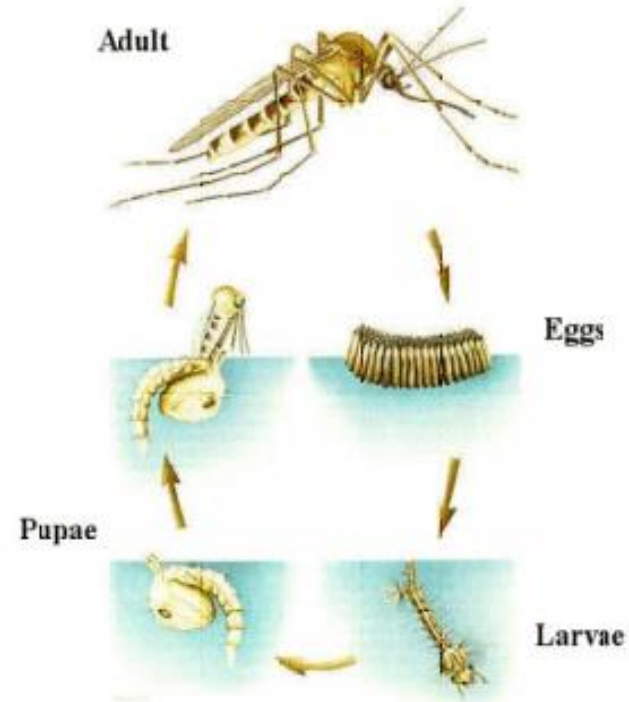
Mosquitoes :

Cosmopolitan , more than 3000 species.

Larval and pupal stages always aquatic

Mouth parts in female adapted to piercing and sucking blood.

Genus and species distinguished by morphology of adult and developmental stages.



Phlebotomus (sand fly)

