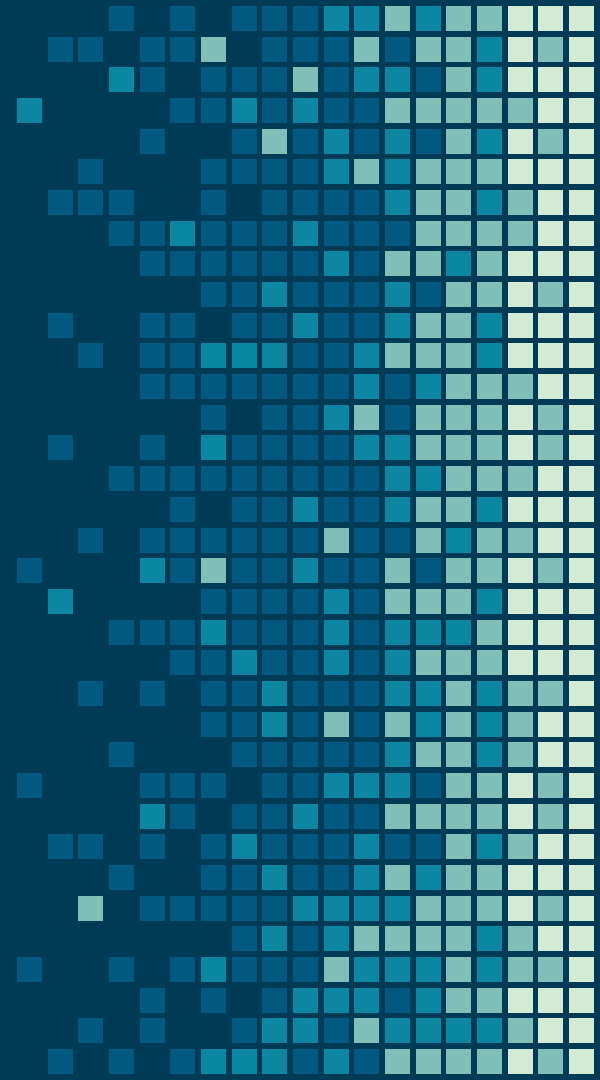
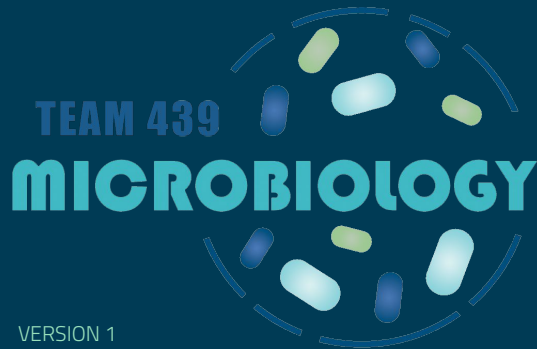


Helminths & Arthropods



Objectives

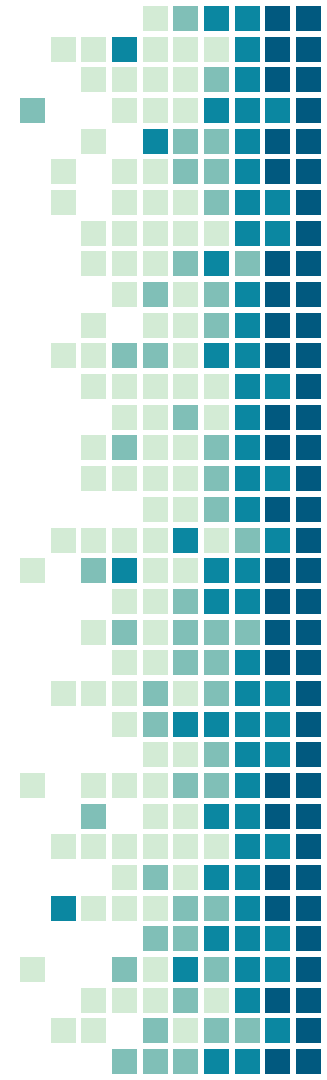
- ❖ Name the three main groups of parasitic helminths and their characteristic morphological features.
- ❖ Describe the life cycle of Ascaris lumbricoides as an example of parasitic helminths .
- ❖ Discuss the role of arthropods as agents and as vectors of diseases in humans.
- ❖ Give examples of the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

Colour index:

- **Red: Important.**
- Grey: Extra info & explanation.
- **Purple: only in girl's slides.**
- **Green: Only in boy's slides.**
-

Any future corrections will be in the editing file, so please check it frequently.

Scan the code
Or click [here](#)

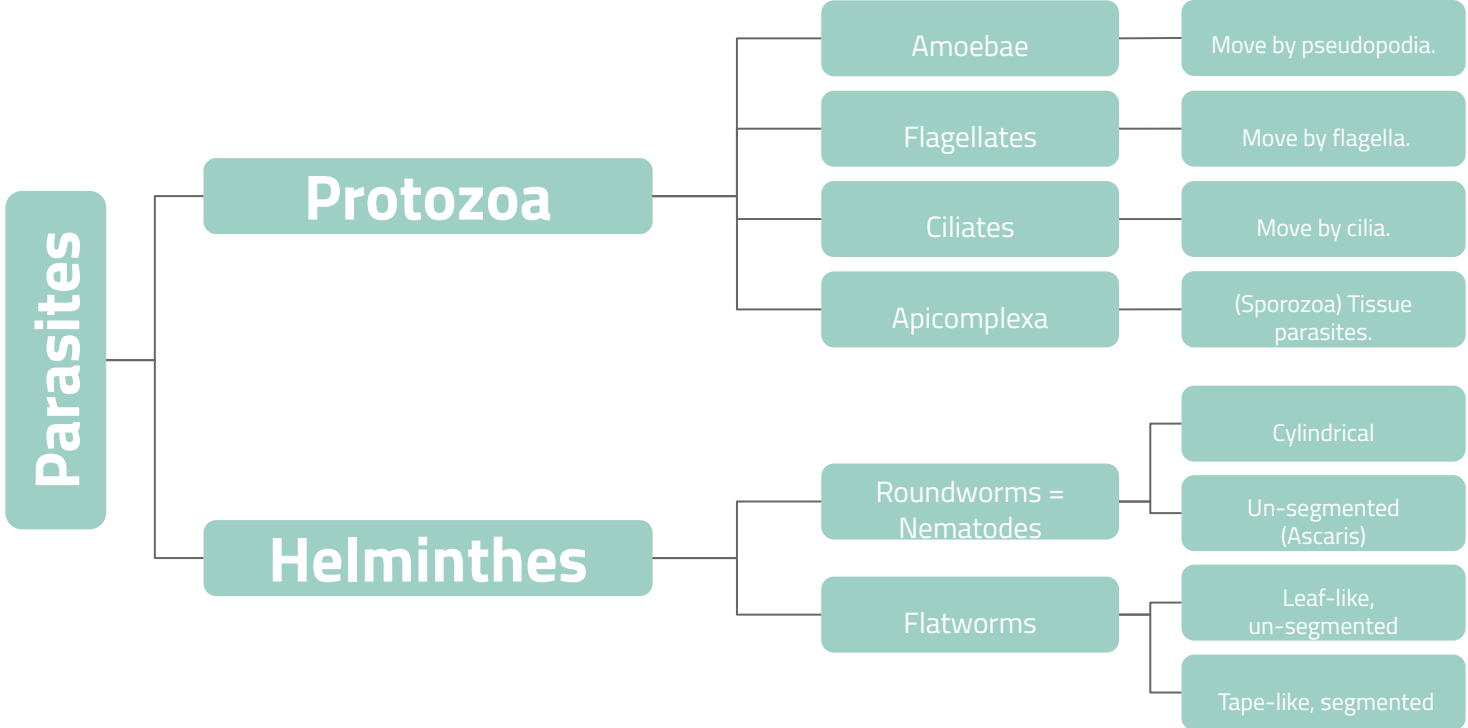


Parasite & Protozoa..

Protozoa	Helminthes
<p>Unicellular Single cell for all function</p>	<p>Multicellular Specialized cells</p>
<p><u>Amoebae:</u> move by pseudopodia.</p> <p><u>Flagellates:</u> move by flagella.</p> <p><u>Ciliates:</u> move by cilia.</p> <p><u>Apicomplexa</u> (sporozoa) Tissue parasites.</p>	<p><u>A- Roundworms = Nematodes</u></p> <ul style="list-style-type: none">• Cylindrical• un-segmented(Ascaris) <p><u>B- Flat worms</u></p> <p>1-Trematodes: leaf-like, un-segmented.</p> <p>2-Cestodes: tape-like, segmented</p>



Classification of Parasites



❖ Location of helminths in the body:

1-Tissue helminths. (It is only in the tissues **NOT** in the blood).

2-Intestinal helminthes

Nematodes (roundworm) intestinal Nematode

General features

Elongated worm, cylindrical, unsegmented and tapering at both ends.

Pointed at the ends.

Variable in size, measure <1 cm to about 100cm.

Sex separate (i.e 2 sexes), male is smaller than female.

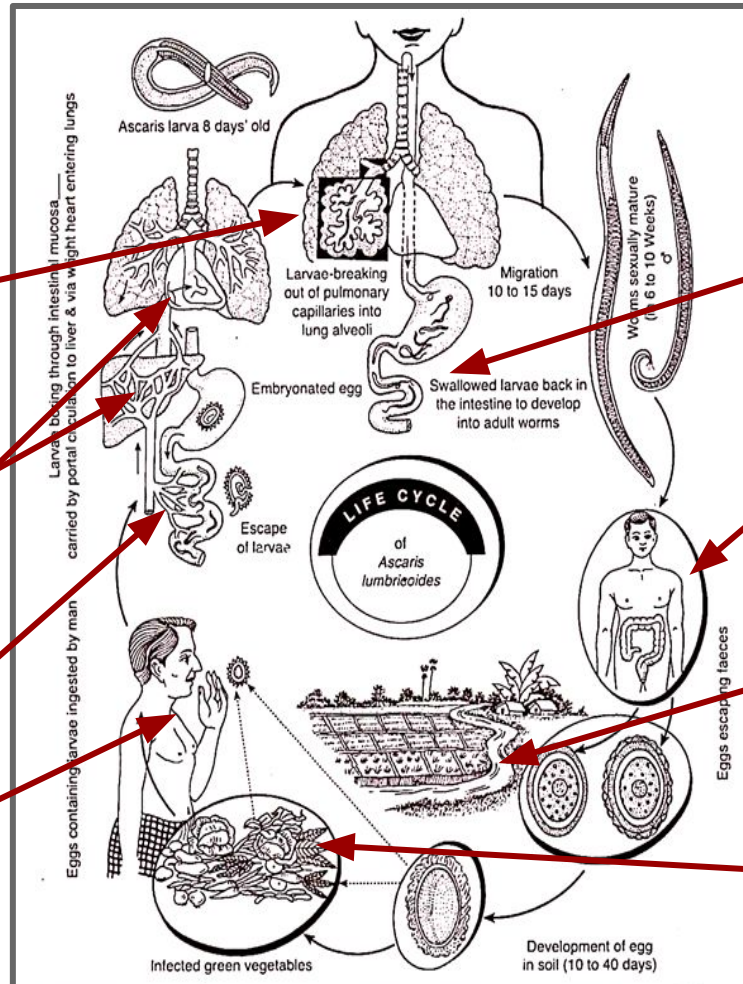
There is a primary host .

Example: *Ascaris lumbricoides* (roundworm) :

- The most common intestinal helminthes, can cause infection to human.
- Found in jejunum and upper part of ileum.
- Female (20-40 cm) which is longer than male (10-15 cm) .
- Feed on semi digested food. * Causes malnutrition (the food is not digested yet which means that the body has not absorbed the nutrients)



Ascaris lumbricoides life cycle



4- In the **alveoli**, where it grow for three weeks

3- It penetrates the wall of the **duodenum**, enter the bloodstream to the heart, liver and enter the **pulmonary circulation** and stay.

2- Then, this **embryonated egg** become a **Larva** in the duodenum

1- Infection starts when man ingest an **Embryonated egg** contaminated with food or water.

5- Then, **Larva** passes from respiratory system to be **coughed up**, swallowed, returned back to the small intestine where it mature to adults male & female, fertilization take place producing eggs

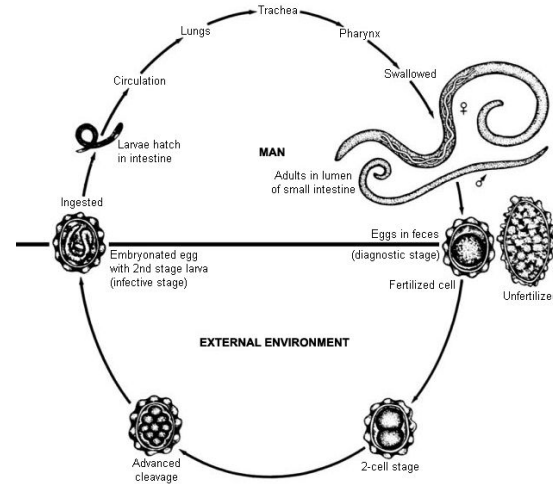
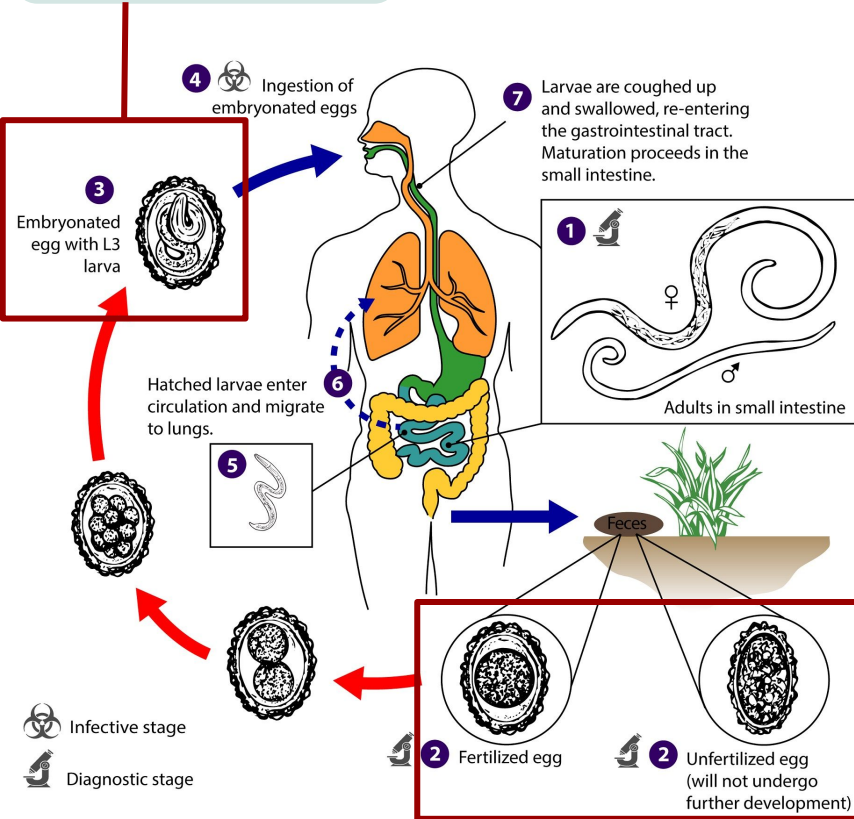
6- Which passes in stool as **Fertilized eggs** or **unfertilized eggs**.

7- Only **fertilized eggs** can be survive in the soil for 2 weeks to become an **Embryonated egg**.

8- **Embryonated egg** ready to infect human with contaminated food.

Ascaris lumbricoides life cycle

**Infective Stage:
Embryonated Egg**



**Diagnostic Stage:
Both Fertilized & Unfertilized Egg**

Pathogenicity

Migrating LARVA

***Not** an **adult** worm

- Ascaris pneumonia
- Mainly reaches the liver
- Some times LARVA reach aberrant sites like brain, heart or spinal cord can cause unusual disturbance.
- Cause pneumonia/asthma like symptoms

Adult WORM

- The worm consumes proteins and vitamins from host's diet and leads to malnutrition.
- Can cause intussusception, intestinal ulcers and in massive infection can cause intestinal obstruction.
- + intussusception

INTESTINAL OBSTRUCTION



Intussusception : يدخل جزء من الأمعاء على الثاني (كل ما كانت الديدان أكثر كانت حركتها أكثر و هذا يؤدي أن الأمعاء تدخل على بعض)

#Notes 438

intestinal obstruction : كثرة الديدان تسبب انسداد للأمعاء .

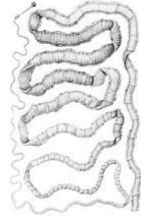
Flatworms

Trematodes



Fasciola

Class - Trematoda



Taenia

Class - Cestoda

Cestodes

- Leaf-like
- Unsegmented
- Transmitted by fecal-oral route

Example:

Fasciola Hepatica

Causes biliary obstruction and jaundice.

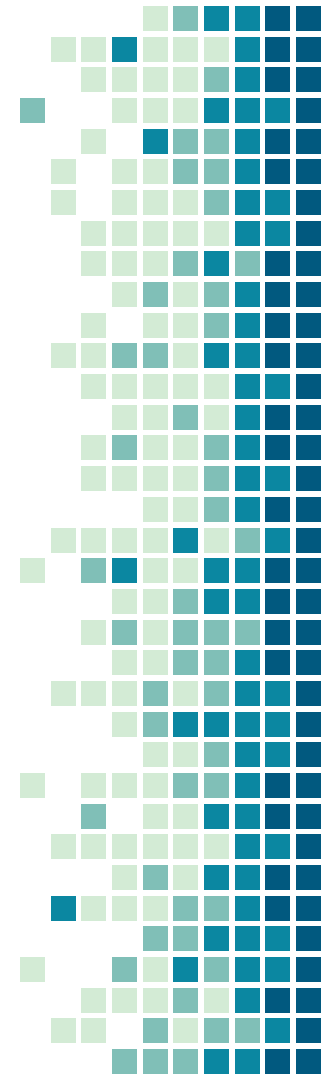
- Tape-like
- Segmented

Example:

Taenia Saginata

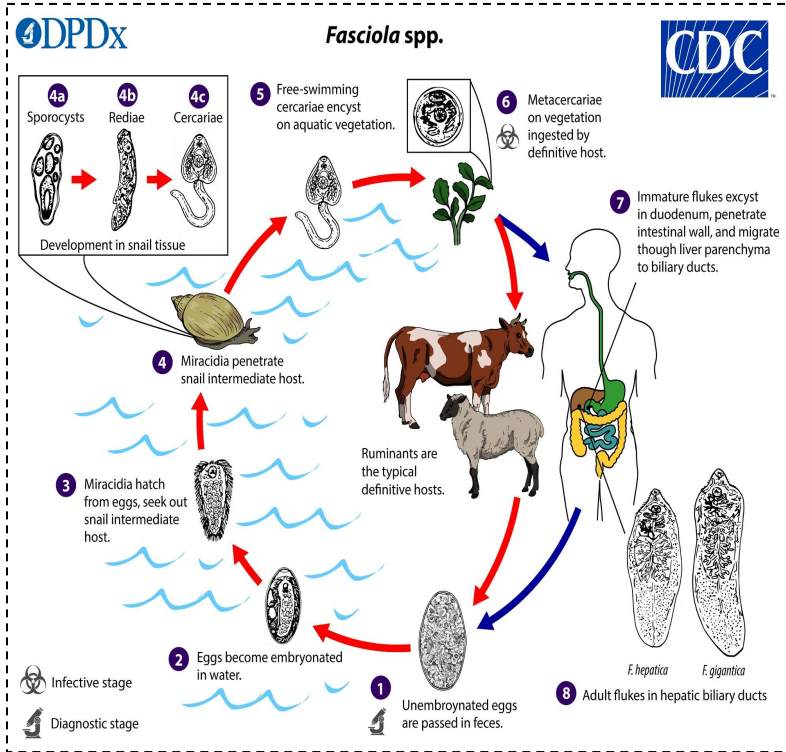
Causes GIT discomfort, diarrhea and vomiting.

Transmitted by fecal-oral route



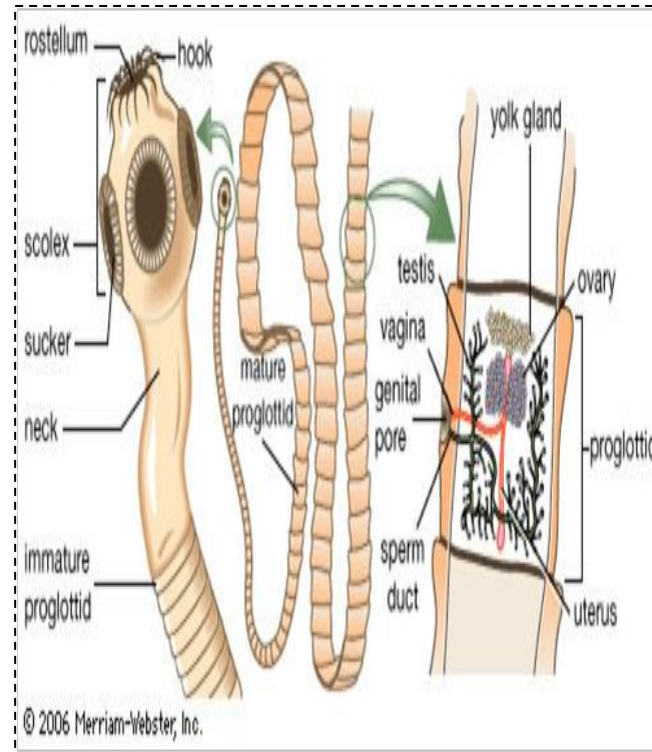
Fasciola Hepatica

Goes through 2 hosts in its life cycle Ruminants (cow or sheep) + snail



Cestode

(are hermaphrodites i.e have male and female sex organs)



Medical importance of Arthropods (المفصليات)

1) As aetiologic agents (causes) of diseases (الحشرة بحد ذاتها تسبب المرض)

- ◆ Tissue damage e.g: **Scabies** الجرب **caused by Mites** العنث
- ◆ Induction of hypersensitivity reactions e.g: by ant
- ◆ Injection of poisons e.g: **Scorpions** العقرب
- ◆ Entomophobia (acarophobia) excessive fear of insects

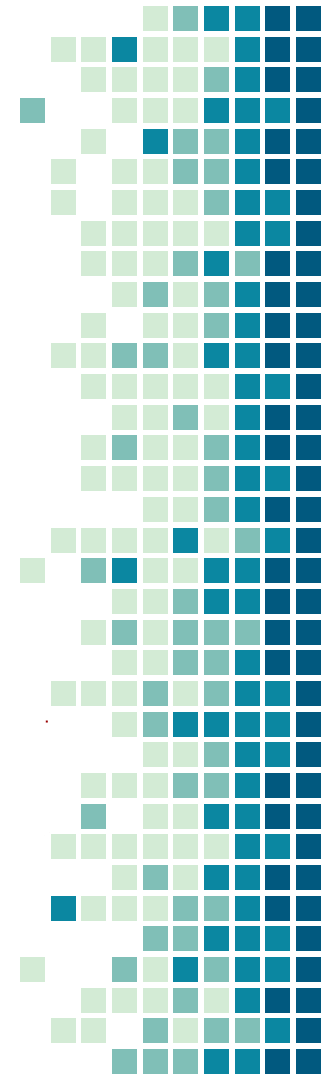
2) As vectors of diseases (transmit the disease)

A. Mechanical transmission - simple carriage of pathogens

B. Biological transmission:

- ◆ Cyclical
- ◆ Propagative
- ◆ Cyclopropagative

C. Transovarial transmission: **transmitted as ricketts is carried within ticks.**



Important arthropod vectors for human diseases

House fly (<i>Musca domestica</i>)	Mechanical transmission of many viruses, bacteria and parasites.
Tsetse fly (<i>Glossina</i>) ذبابة التسي تسي	Vector for African Trypanosomiasis (African sleeping sickness)
Sand fly (<i>Phlebotomus</i>) ذبابة الرمل	Vectors for leishmania
Black fly (<i>Simulium</i>) الذبابة السوداء	Vector for <i>Onchocerca</i> (river blindness)
Mosquitoes البعوض	<i>Anopheles</i> :malaria filariasis <i>Culex</i> : filariasis, viruses <i>Aedes</i> : yellow fever, dengue fever, Rift Valley Fever -Larval and pupal stages are always aquatic
Lice القمل (<i>pediculus humanus</i>)	Body louse: vector for (aetiologic agent) : Relapsing fever, typhus and trench fever.
Fleas البراغيث	Rat flea is vector for plague due to <i>Yersinia pestis</i>
Cyclops	Vector for <i>Dracunculus medinensis</i>



ARTHROPODS OF MEDICAL IMPORTANCE

Class <i>Insecta</i> الحشرات	Class <i>Arachnida</i> العنكب	الفشريات Class <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>)

Scabies by Mites



Lice



Sand Fly



Tsetse Fly



MCQs

Q1- which of the following is the right description of a Cestode?

- A) Tape-like, unsegmented
- B) Cylindrical, segmented
- C) Leaf-like, unsegmented
- D) Tape-like, segmented

Q2- Elongated worm, cylindrical, unsegmented

- A) Cestodes
- B) Nematodes
- C) Apicomplexa
- D) Flagellates

Q3- Tsetse fly is the vector for:

- A) African Trypanosomiasis
- B) Leishmania
- C) Onchocerca
- D) Q fever

Q4- The infective stage in *Ascaris lumbricoides* life cycle

- A) Underutilized egg
- B) larva (embryonic egg)
- C) Fertilized egg
- D) cell stage

Q5- Vector of Leishmania:

- A) House fly
- B) Sand fly
- C) Tsetse fly
- D) Black fly

Q6- Embryonated eggs becomes larva in:

- A) Stomach
- B) Pancreas
- C) Liver
- D) Duodenum

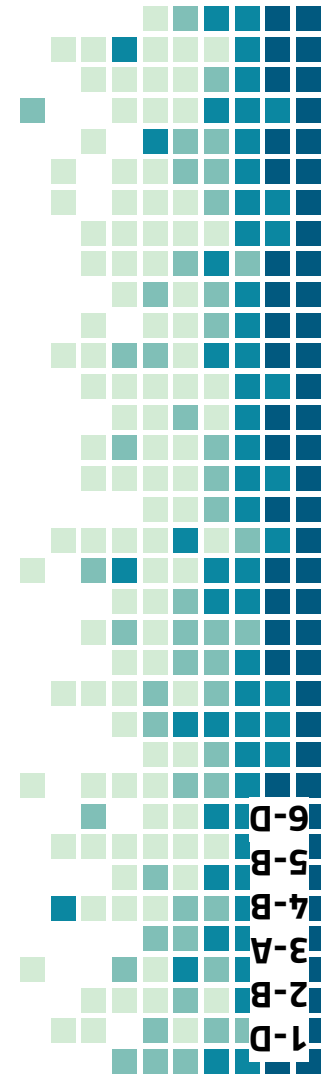
SAQ:

Q1- List the diseases transported by Lice

Q2- Give an example of a Trematode

A1: relapsing fever, typhus, trench fever

A2: Fasciola hepatica



Q-9
B-5
B-7
A-3
B-2
D-1

Team Leaders

- Duaa Alhumoudi
- Manee Alkhalifah

Team Members

- Sarah Alqahtani
- Sadem Alzayed
- Noura Alshathri
- Ghadah Alsuwailem
- Shahad Almezel
- Noura Alsalem
- Sumo Alzeer
- Renad Alhomaidi
- Raghad Albarrak
- Reema Alowerdi
- Abdulaziz Alderaywsh
- Sultan Alqahtani
- Faisal Alomri
- Munib Alkhateeb
- Abdulaziz Alomar
- Muhannad Alomar
- Meshal alhamed



Contact us through:
Microbiology439@gmail.com