MEDICINE
KING SAUD UNIVERSITY

microbiology

LECTURE:

IMPORTANT.
DOCTORS NOTES.
EXTRA INFORMATION.

PARASITIC HELMINTHS AND VECTORS OF DISEASE

Objective:

- Name the three main groups of parasitic helminths and their characteristic morphological features . 3-4
- Describe the life cycle of **Ascaris lumbricoides** as an example of parasitic helminths . 6-7
- Discuss the role of arthropods as **agents** and as **vectors** of diseases in humans. 14-16
- Give examples of the main arthropod vectors of diseases. 14-16

Classification of Parasites

Protozoa	Helminthes
Unicellular Single cell for all function	**Mulicellular** Specialized cells
-Amoebae: move by pseudopodia. -Flagellates: move by flagella. -Ciliates : move by cilia -Apicomplexia (sporozoa) Tissue parasites	A- Round worms = Nematodes cylindrical , un-segmented (Ascaris) B- Flat worms 1-Trematodes: leaf-like, un-segmented. 2-Cestodes: tape-like, segmented

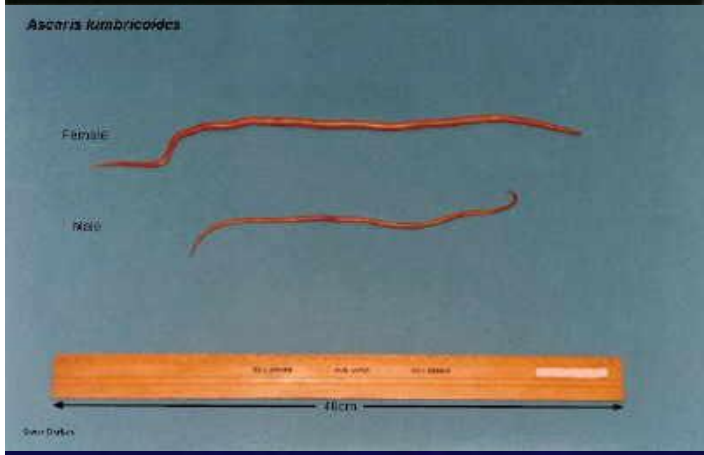
Location of helminths in the body:

- **Intestinal helminthes:**
- **Tissue helminthes:**

Nematodes (round worm) intestinal Nematode:

General features

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



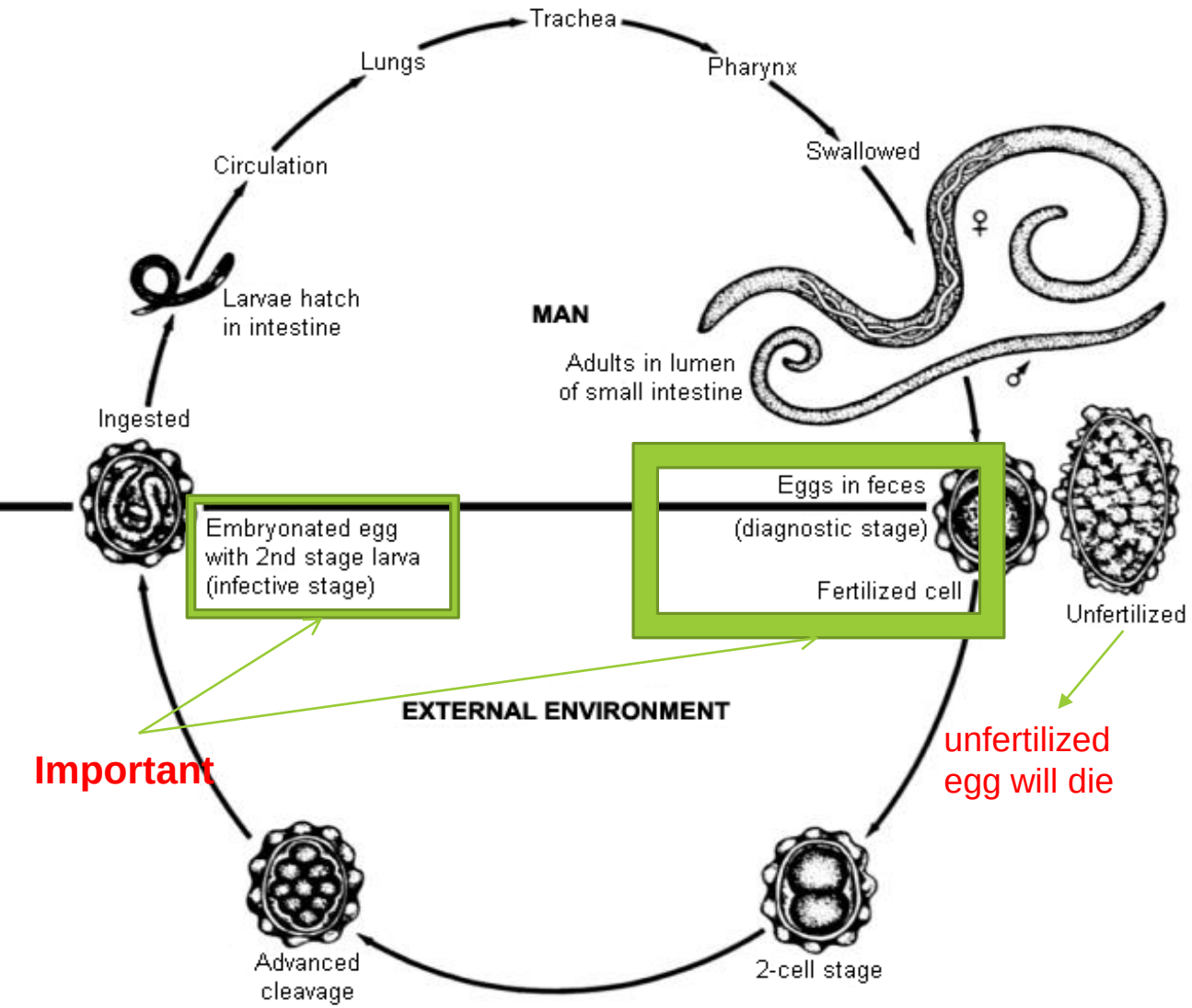
Example:

Ascaris lumbricoides (roundworm)

-The commonest 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. (تتغذى على نفس غذاء العائل)

Can cause malnutrition

Ascaris lumbricoides life cycle

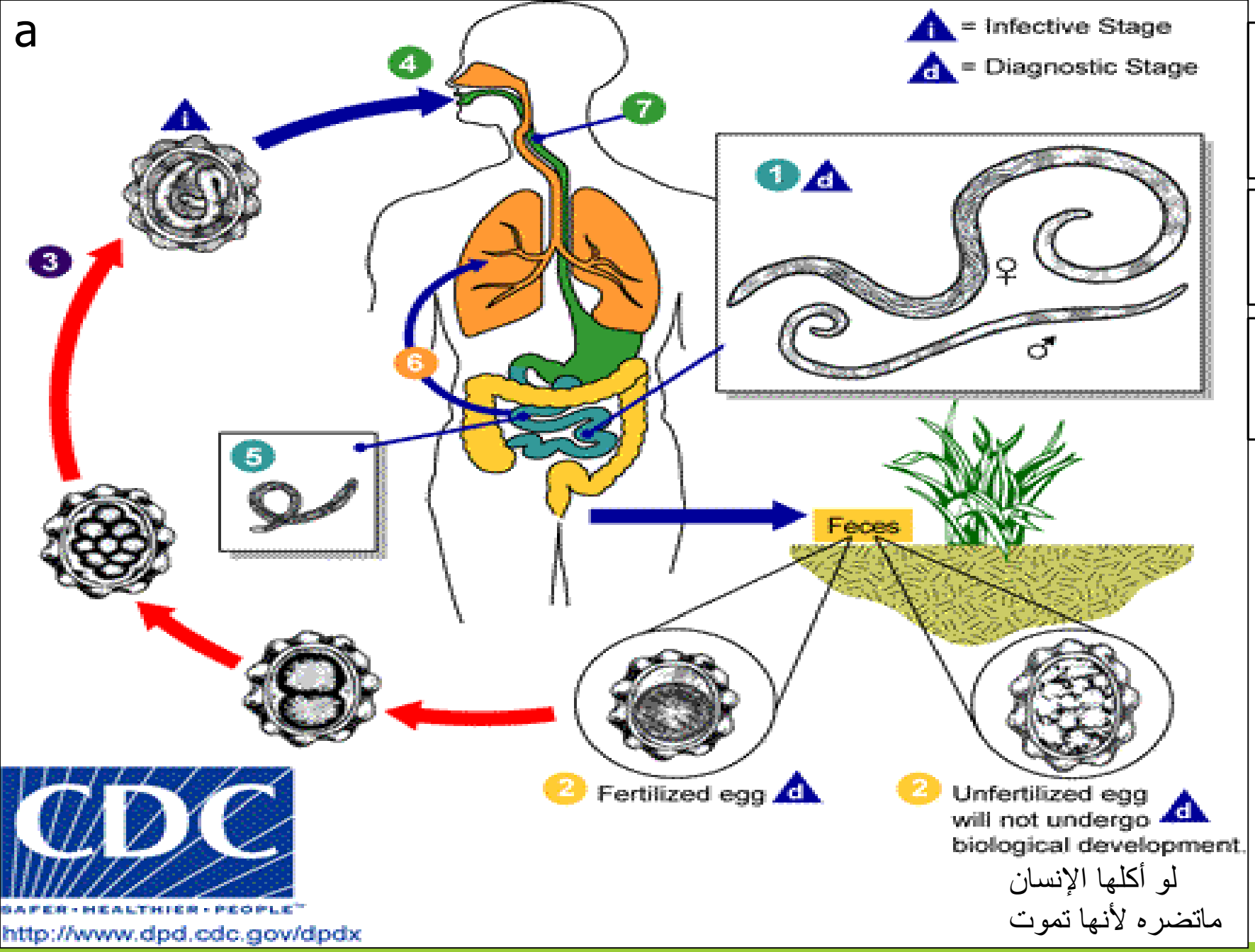


It infect the human when man ingest an **fertilized egg** contaminated with food or water

then this fertilized egg become a **Larva** that penetrate the wall of the **duodenum** and enter the blood stream to the heart , liver and enter the pulmonary circulation and stay in the **alveoli** ,where it grow and molts for three weeks

then **Larva** passes from respiratory system to be **coughed up** ,swallowed ,returned to the small intestine where it mature to adults male &female

fertilization take place producing eggs which pass in stool



Human : definitive host (primary) - - sexual

Diagnostic stage is both fertilized egg and unfertilized

ممكن تسبب آلام للمريض أو انسداد

Pathogenicity

Migrating LARVA

Ascaris pneumonia , some times LARVA reach aberrant sites like brain ,heart or spinal cord can cause unusual disturbance.

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.

flat warm :

2-Cestodes

- tape-like
- segmented

Taenia saginata

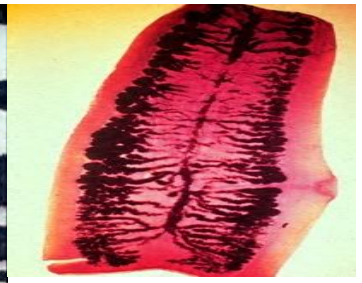
1-Tremadotes

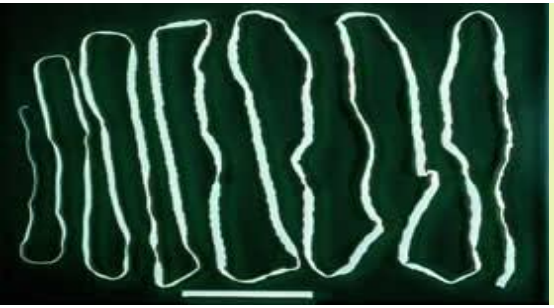
- leaf-like
- un-segmented.

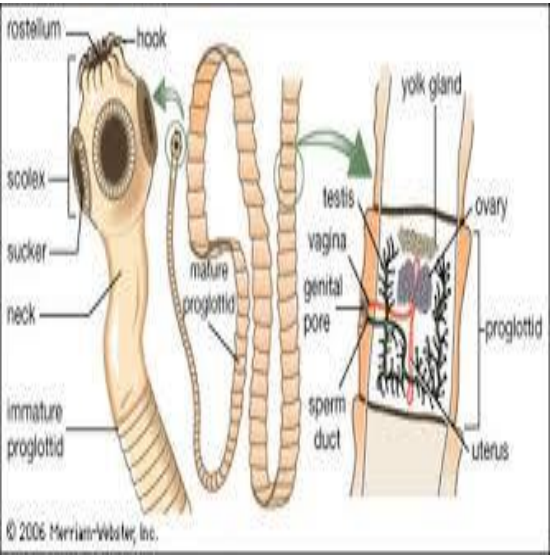
fasciola hepatica

غير مطالبين بدورة حياتها

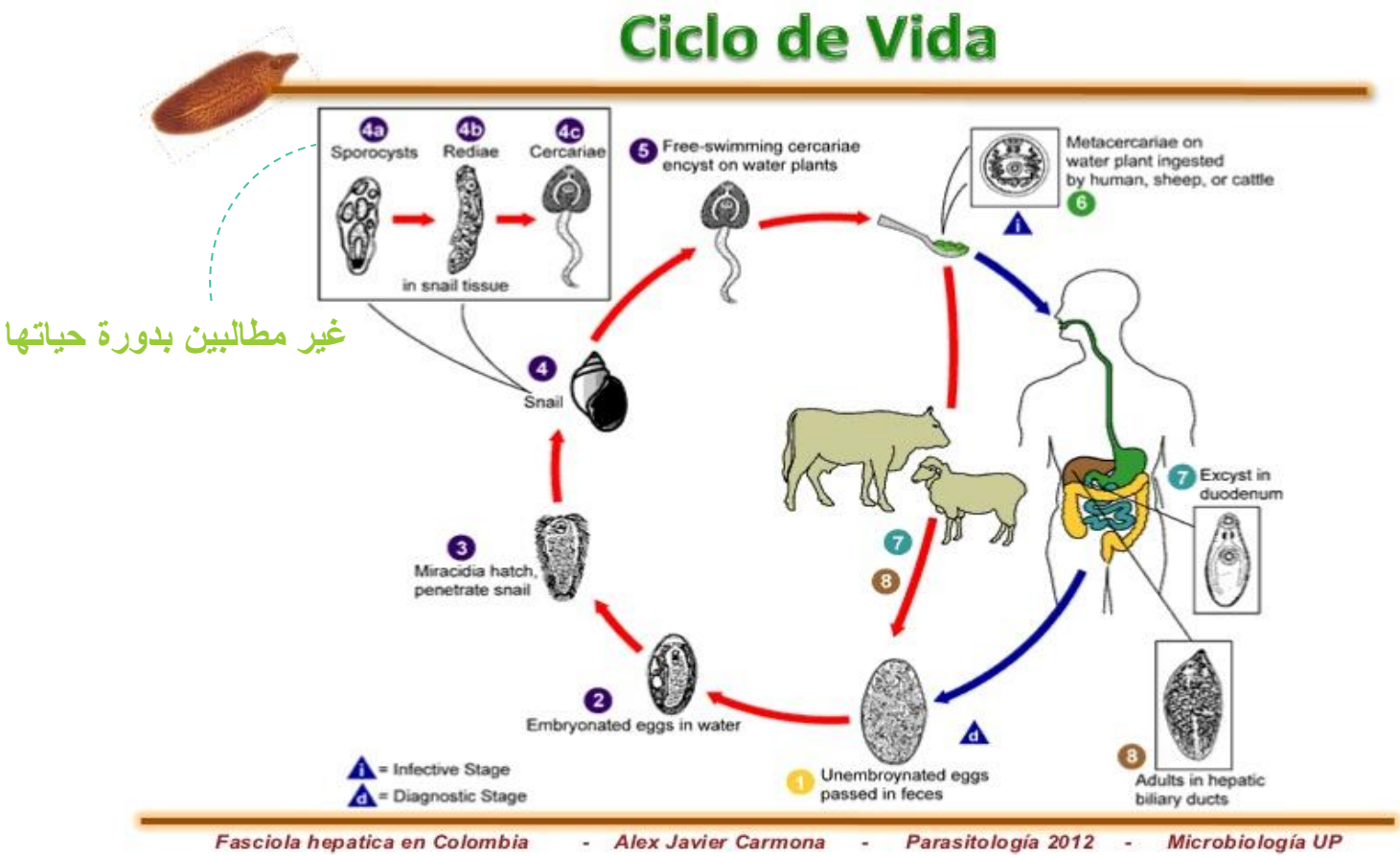
Taenia saginata

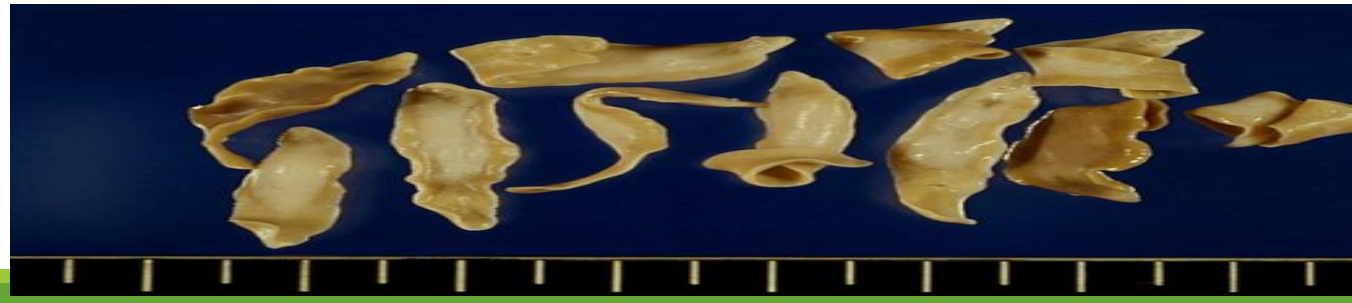






fasciola hepatica





MEDICAL IMPORTANCE OF ARTHROPODS

1)As etiologic agents (causes) of diseases.

- **Tissue damage Scabies** الحشرة هي المسببة للمرض
- **Induction of hypersensitivity reactions.** تعتمد على حسب حساسية الشخص للحشرة
- **Injection of poisons Scorpions.**
- **Entomophobia (acarophobia)** phobia

2) As vectors of diseases:

I: Mechanical transmission 1

- simple carriage of pathogens e.g.: flies

III: Transovarian transmission: 3

transmitted as vector from arthropods parents to offspring as ricketsis carried within ticks.

تأخذ المرض وتورثه لأخرى

ينتقل من جيل إلى جيل

II: Biological transmission: مهمة جدًا 2

يتكاثر فيها المرض لكن لا تورثه لأبنائها

1- Cyclical: cyclical change only but does not multiply in the body of the vector e.g. :filarial parasite. تدخل طفلة تطلع كبيرة

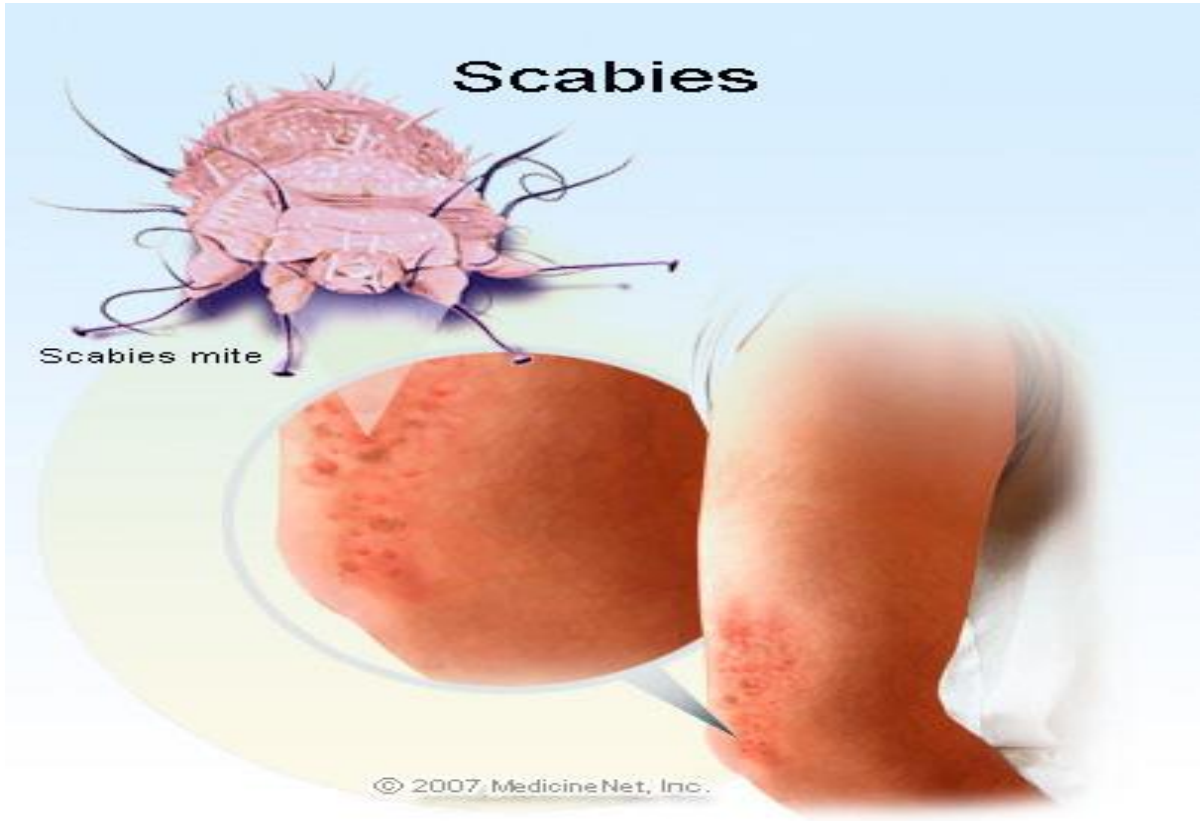
2- Propagative: when the disease agent undergo no cyclical change but multiplies in the vector e.g.: plaque bacillie in rat fleas.

وحدة حشرة تضاعفت

3- Cyclo-propagative: the disease agent undergoes cyclical change and multiply in the body of arthropods e.g.: Malaria in mosquito

:p تكبر وتتزوج وتخلف

Scabies as tissue damage example of Arthropod **As etiologic agents (causes) of diseases.**



ARTHROPODS OF MEDICAL IMPORTANCE

Class Insecta الحشرات	Class Arachnida العناكب	القشرياتClass Crustacea
1. Muscid flies:- Housefly,Tsetse fly 2. Myiasis-producing flies . 3. Mosquitoes: البعوض- Anopheles, Aedes Culex 4. Sandfly: ذباب الرمل - (Phlebotomus) 5. Black fly (Simulium) 6- Fleas البراغيث 7. Lice: القمل - Pediculus, Phthirus. 8. Bugs: البق - Cimex, Triatoma. 9. Bees: النحل	1. Spiders: العناكب 2. Scorpions العقارب 3. Ticks: القراد hard, soft 4. Mites: السوس - Dust mites - Sarcoptes scabiei,	1. Water flea: - Cyclops.

Important arthropod vectors for human diseases

Transmitter	Disease
House fly (Musca domestica) **الذباب المنزلي**	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: Borrela duttoni Hard ticks Include vectors for Babesiosis (protozoa), Q fever and Rocky mountain spotted fever
Tse tse fly (Glossina) **ذبابة التسي**	Vector for African Trypanosomiasis (African sleeping sickness)
Black fly (Simulium) **الذبابة السوداء**	Vector for Onchocerca (river blindness)
Sand fly (Phlebotomus) ذبابة الرمل	Vectors for Leishmania and sandfly fever virus.
Cyclops	Vector for Dracunculus medinensis

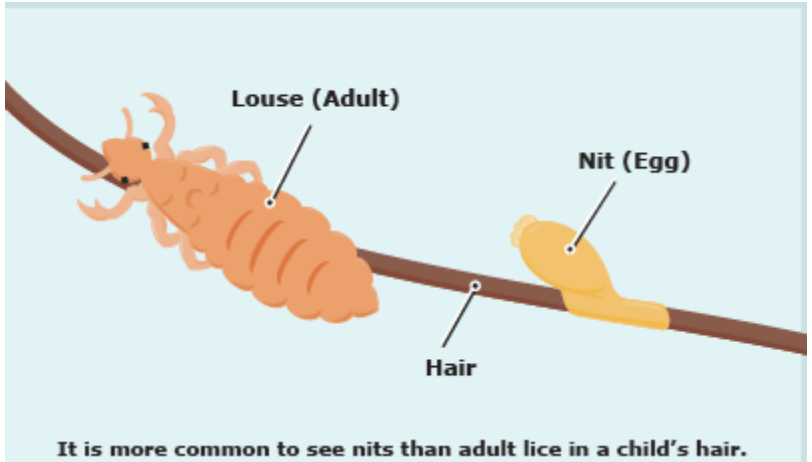
Important arthropod vectors for human diseases

مهمة جدًا

Sand flay transmit leishmania

Louse (singular) , Lice (pleural)

Pediculus humanus



Important arthropod vectors for human diseases

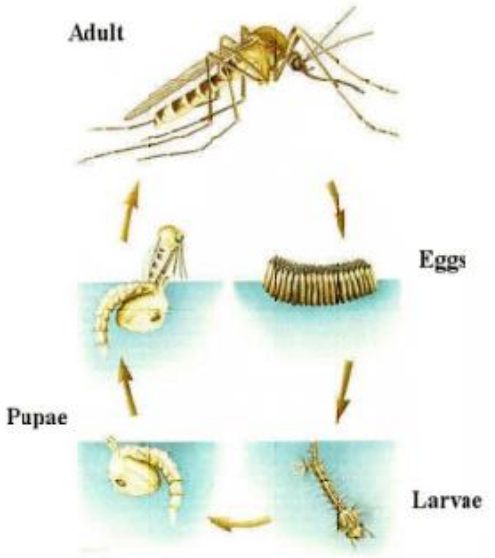
Mosquitoes:

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.



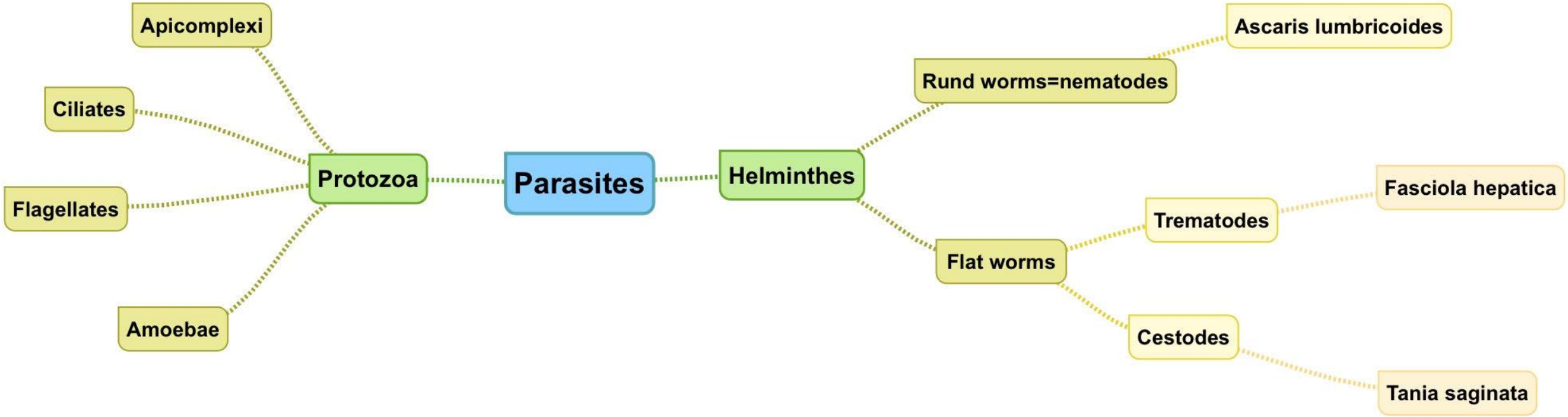
Cyclo-propagative

Malaria

Mosquitoes

Always know more ;)

Summary



quiz

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