

الكلية: الطب

القسم او الفرع: الاحياء المجهرية

المرحلة: الثالثة

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اسم المادة بالغة العربية: الطفيليات الطبية

اسم المادة باللغة الإنكليزية: **Medical Parasitology**

اسم المحاضرة الثالثة باللغة العربية: المثقوبات: الدودة الكبدية

اسم المحاضرة الثالثة باللغة الإنكليزية: **Trematodes: Liver Flukes**

محتوى المحاضرة الثالثة

Helminthology

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المحاضرة وصف : اولا

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: التعليمية الاهداف : ثانيا

(الفاشيولا) المتورقات داء عن أساسية مفاهيم الطلبة اكساب : الخاص الهدف

: ان على المحاضرة نهاية في قادرا الطالب جعل : السلوكية الاهداف

1- ان يعدد المميزات العامة لشعبة الديدان المسطحة (تذكر)

2- يفسر الية حدوث المرض (فهم)

3- يلخص الدودة حياة دورة خطوات (فهم).

4- ان يستعمل مختلف الطرق للتأكد من التشخيص (تطبيق).

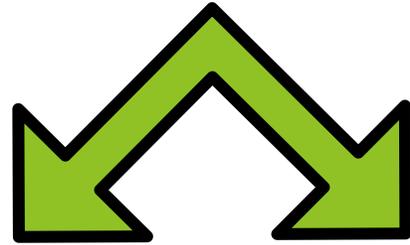
5- ان يبرهن اسباب حدوث المرض (تطبيق).

6- ان يقارن بين الانواع (تحليل).

7- ان يقيم مدى كفاءة العلاج المخصص للمرض ومدة استخدامه (تقويم).



Helminths



1-Platyhelminthes

- Trematodes** •
- Cestodes** •

2-Nemathelminthes

- Nematodes** •



Trematodes

General features :

- The trematodes (or flukes) are leaf like flattened dorsoventrally.
- They vary in size from the species just visible to the naked eyes, like Heterophyes to the large fleshy flukes, like Fasciola and fasciolopsis .
- Most trematodes have a complex life cycle with at least two hosts , the primary host (sexual reproduction) is a vertebrates . the intermediate host (asexual) is a snail.
- The outer surface of flukes (cuticle) is covered with microvilli that help in absorption of food also covered with spines that help in fixation.
- There are two muscular suckers or attachment organs that help in fixation of the parasite, an anterior oral sucker and a posterior ventral sucker .
- Have no body cavity.



- Bilaterally symmetrical.
- Unsegmented.
- Most trematodes are hermaphroditic and most of the body consists of two reproductive organs and their associated structures.
- The digestive system is well developed; consist of the mouth surrounded by the oral sucker, muscular pharynx and the esophagus which bifurcates in front of ventral sucker into a pair of blind caeca. they generally feed on intestinal debris, blood, mucus and other tissues.
- Trematodes complete their life cycle in three different hosts, one definitive host (man) and two intermediate hosts. The first intermediate host is fresh water snail and the second intermediate host is either aquatic plant or fish.
- Trematodes have many larval forms such as miracidium, sporocyst , redia , cercaria, metacercaria .
- Trematodes are oviparous and lay eggs, which are operculated, except in case of schistosomes .



- Trematode eggs have a smooth hard shell and the majority of them are operculate.



The trematodes are classified according to invaded area into :

- **Intestinal Flukes**

The principal intestinal fluke infecting humans is *Fasciolopsis buski*

- **Tissue Flukes**

The human liver plays host to two major flukes, both of which live in the bile ducts. *Fasciola hepatica* , *Fasciola gigantica* has a similar life-cycle to *Fasciola hepatica* . The Chinese Liver Fluke, *Clonorchis sinensis* is a smaller fluke which also lives in the bile ducts.

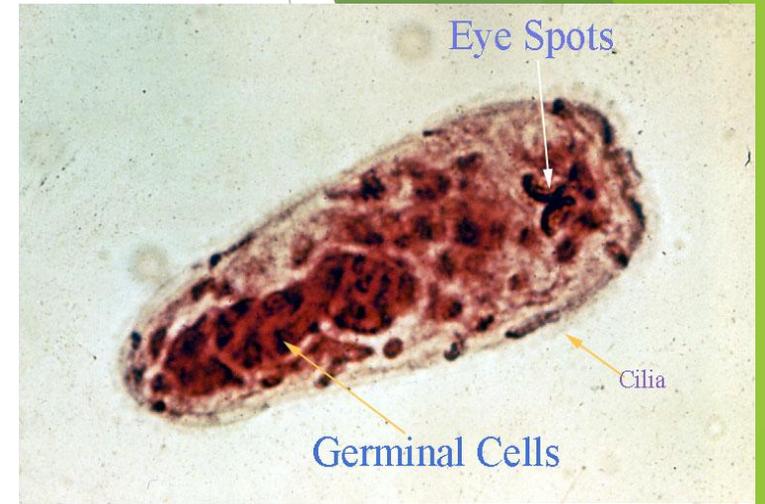
- **The Blood Flukes**

The *Schistosomes* : a unique feature enjoyed by Schistosomes among the trematodes is that they are dioecious (sexes separate).

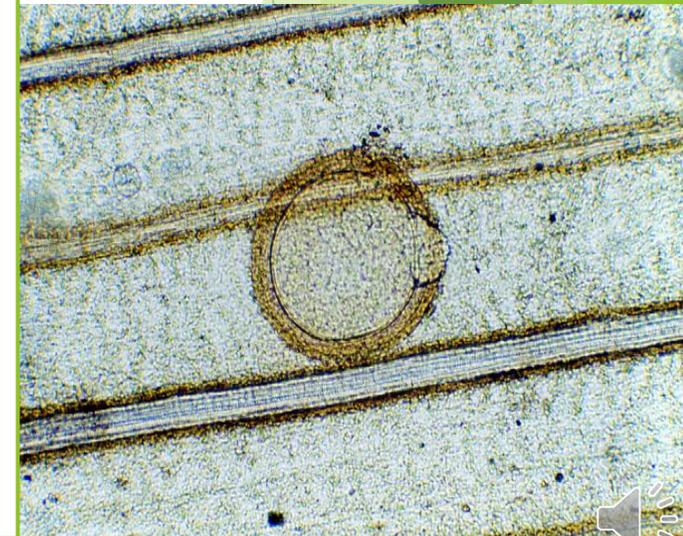


Larval stages

- **Miracidium** - This larval stage is ciliated and slightly oval in shape. It has 2 simple eyespots that serve as sensory organs.
- **Redia** - At this larval stage, it retains a very simple worm structure. In some ways, it still resembles a sac. It has a pharynx but no esophagus or intestine.



- **Cercaria** - this stage, resembles a small adult with a tail to aid in locomotion. It is brownish in color. Unlike an adult, it has two eyespots, penetration glands at its anterior end, and a cuticle with small spines.
- **Sporocyst** –a sac like stage contain germinal cells.
- **Metacercaria** - is encysted and it is the infective stage , It has lost larval organs such as the eyespots and the tail. The round cyst has very thick wall.



Fasciola hepatica

- Also known as the **common liver fluke** or sheep liver .
- The disease caused by the fluke is called fascioliasis (also known as fasciolosis)
- They are large leaf-shaped parasites about 2–3cm long.
- There are two suckers, an anterior oral sucker surrounding the mouth and a ventral sucker (acetabulum) on the ventral surface.
- The outer **tegument** is covered in tiny spines enabling them to attach themselves along with their suckers to the tissues.



- It is possessing both **ovaries** and **testes**, which are highly branched and occupy a large part of the body. The adult is grayish brown in color, with a flattened body.
- The anterior end of the parasite forms a conical projection that broadens at the shoulders, then gradually narrows towards the posterior end.

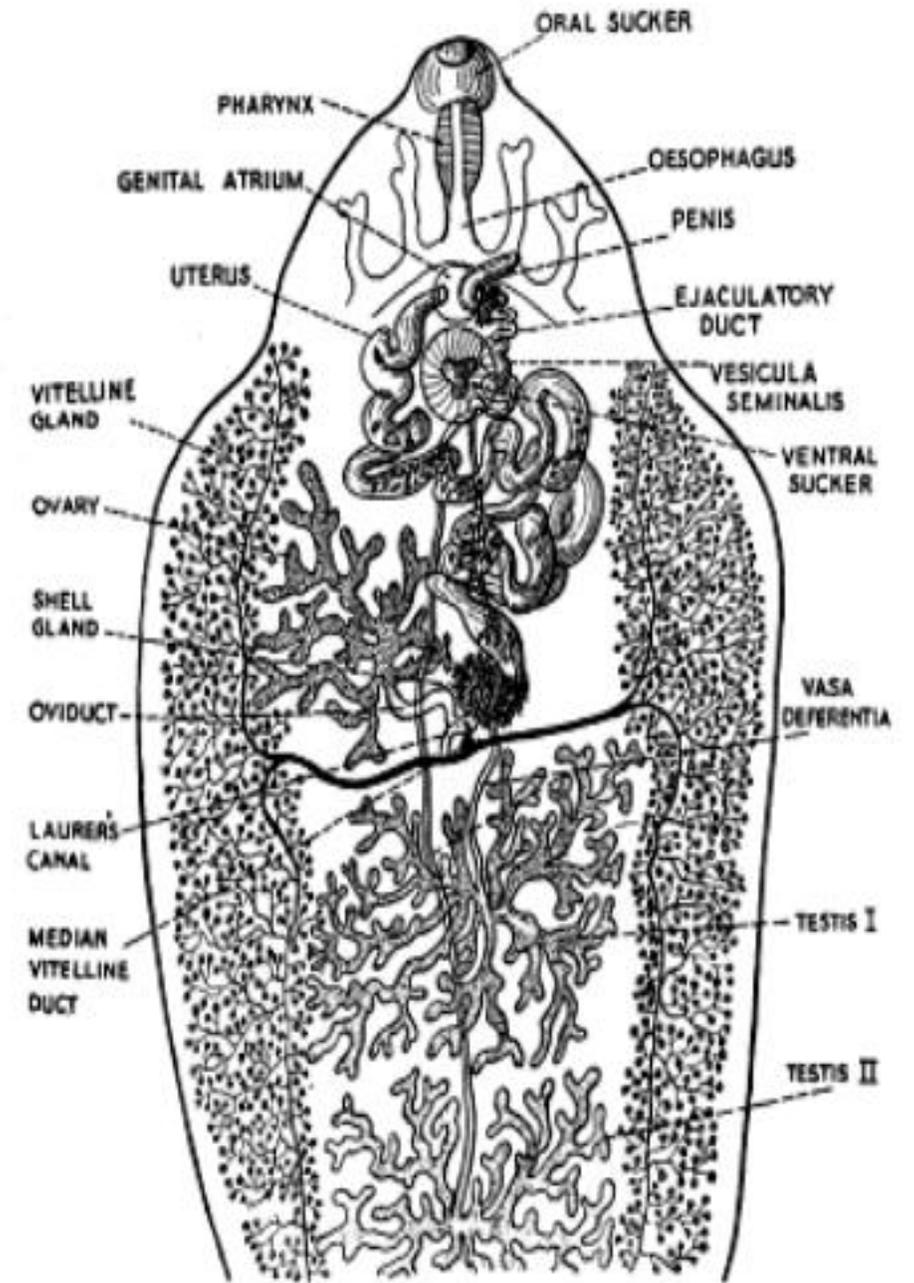
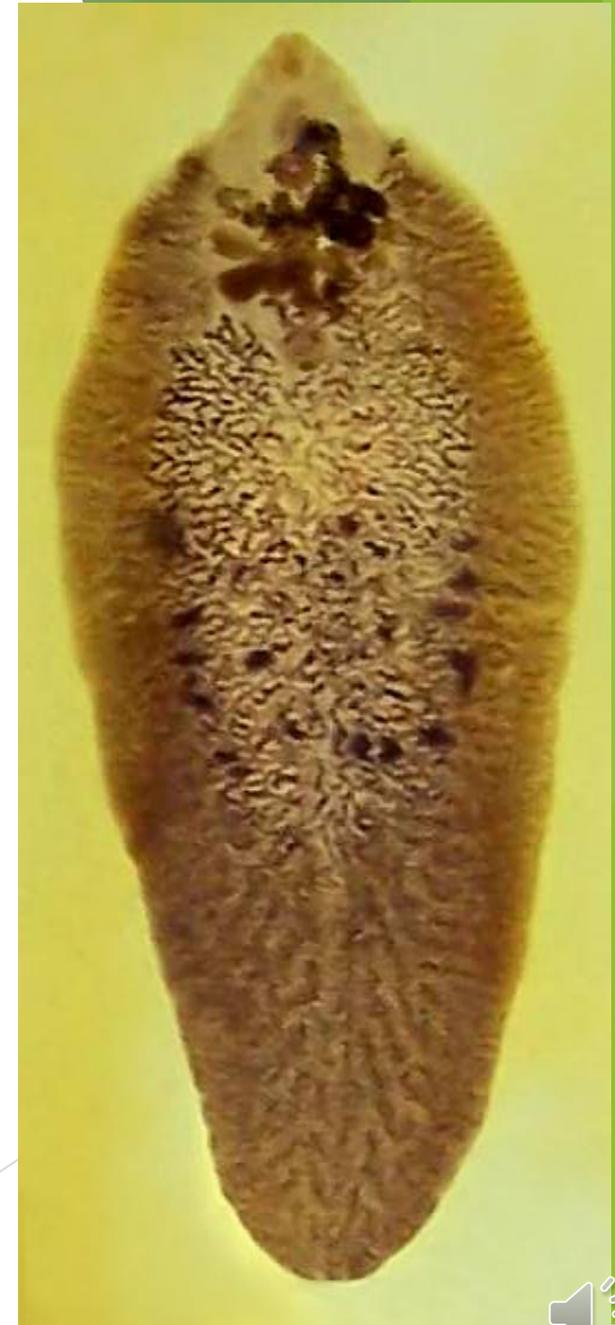


Fig. 65. FASCIOLA HEPATICA.—Diagram of the reproductive system.

- The alimentary canal consists of two main branches of the caeca
- The male and female reproductive system is well-developed.
- The testes lie one behind the other in the middle portion of the body. The small, highly branched ovary is in front of anterior testis
- The uterus, filled with eggs is confined to anterior third of the body.



- Ova are oval operculated and thin shelled, yellow-brown in color (bile stained) immature ovum in content .



Life cycle

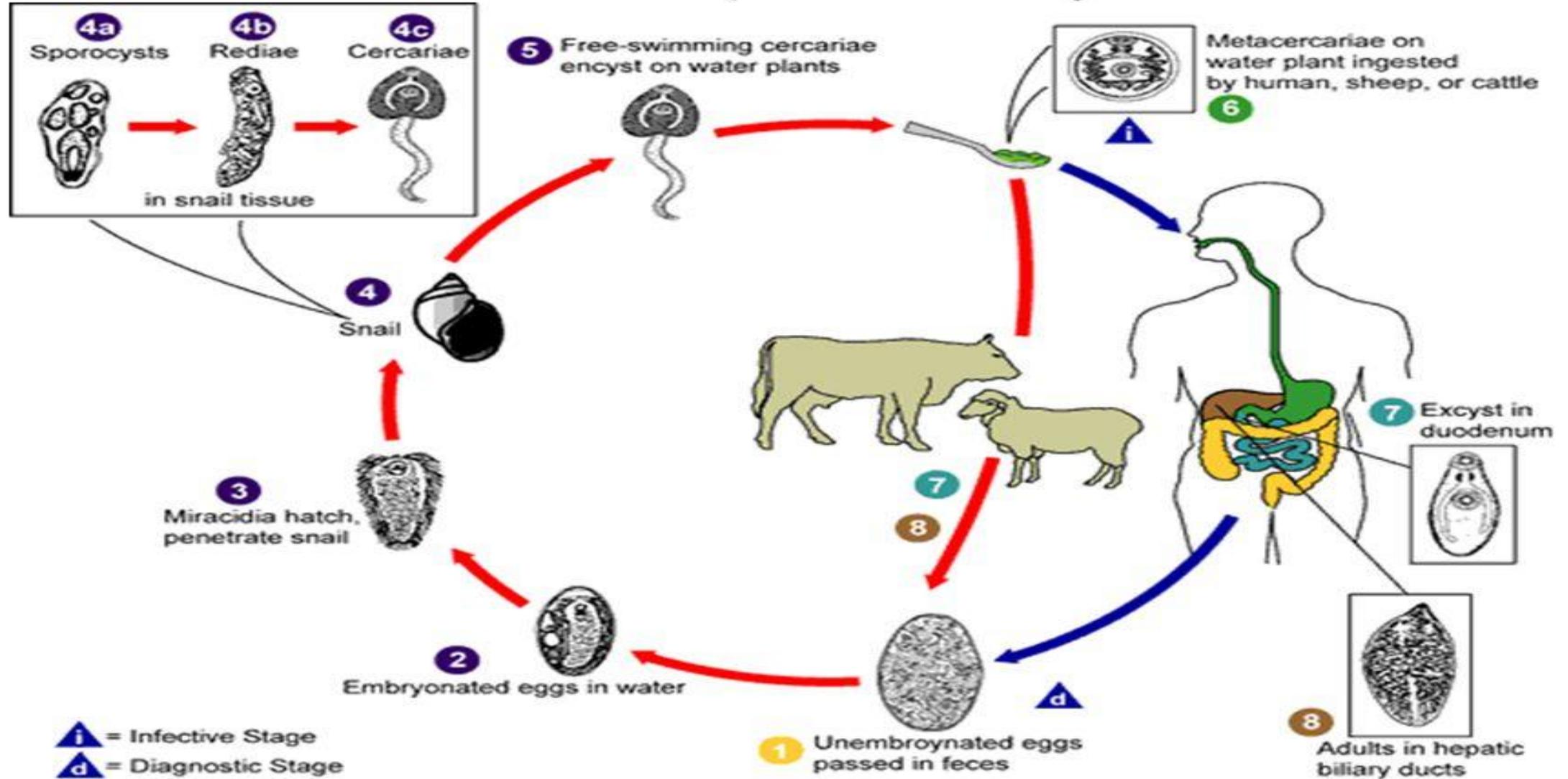
- Aquatic snail as an intermediate host such as Lymnaeae in which the parasite can reproduce asexually.
- From the snail, minute cercariae emerge and swim through pools of water in pasture, and encyst as metacercariae on vegetation.
- the metacercariae are ingested by the ruminant, or in some cases, by humans eating uncooked foods such as water-cress.



- In the duodenum, the parasite breaks free of the metacercariae and burrows through the intestinal lining into the peritoneal cavity.
- The parasite then reside in the liver tissue for a period of up to 5-6 weeks and finds its way to the bile duct where it matures into an adult and begins to produce eggs.



Fasciola hepatica life cycle



Diagnosis

Clinical :

fever ,hepatomegaly, eosinophilia and history of eating raw vegetables .

Laboratory :

A)Direct: by finding characteristic eggs in stool or duodenal aspirate (Entero test).to differentiate between true and false fascioliasis . the patient is asked to consume liver-free meals for 3 consecutive days before the confirmative stool sample is taken.
If the eggs continue to be found in the stool, the diagnosis is confirmed .

B)Indirect:

Serological tests: as (IFAT), (IHAT), (ELISA) to detect the specific antibodies in the serum, using antigens from the adult worm Elevated serum antibodies, (IgE).



Thank you