



**Lecture title: Helminthology**

**Lecturer Affiliation:** Department of Microbiology , College of Veterinary Medicine, University of Mosul, Mosul, Iraq. **nadia.hamid@uomosul.edu.iq**

**Summary: *Helminthology***

**Phylum : Platyhelminthes**

**Class :Cestoda**

**Order Cyclophyllidea**

**Family : Taeniidae**

The adults of this family are large in size , the rostellum is usually present and may be absent , armed with double row of small and large hooks .

Head have four suckers and the mature segment have one set of genital organs.

Ovary lies in the posterior portion of the segment ,the uterus could be defined as a cystic structure . Male genitalia consist of testes . The gravid segment occupied by lateral branches of uterus , the variation and the number of the branch's determine the species of the worm

The eggs surrounded with two shields separated by septum , so the egg shield looking hard and have a bicycle like shape and having an onchosphere

**Genus : Taenia**

**Species : *T. saginata***

**Shape :**



The adult worm parasitizing the - small intestine of human while the larval stage is found in the muscles of cattle and called *Cysticercus bovis* , this stage is rounded or oval structures (5.5 x 9-9.5 ) mm . Its normal sites are muscles , liver , lung , kidney , diaphragm and heart . Length of adult worm 4-8m . The scolex have no rostellum , no hooks,.

### **Life cycle and how the infection Occur ?**

Cattle play an important role as intermediate host due to the larval stage *Cysticercus bovis* could be found in masseter muscle , heart , diaphragm and tongue also it could be found in any body muscle . Goat and sheep also could play an important role as intermediate hosts , the final host (man) infected by eating uncooked infected meat with *cysticercus bovis*.

### **Diagnosis :**

- 1- Slaughter the animals and searching for *Cysticercus* in muscles
- 2- serological techniques
- 3- detection of eggs in feces of infected man.

### **Species : *T. hydatigena***

The final host : small intestine of dog and other carnivorous animals .

The larval stage of this species usually found in peritoneal cavity of sheep goat cattle (intermediate host) and it called *Cysticercus tenuicollis*.

Adult worm measure 75-500 cm in length, scolex small in size with rostellum armed with two rows of hooks being 26-44 hooks

### ***T. pisiformis***

Final host : small intestine of dogs and foxes rarely in cats,

Intermediate hosts : Rodents, rabbits and wild rabbits



larval stage is called :(*Cysticercus pisiformis*) could be find in peritoneal cavity adhering with the viscera of the intermediate host .

Final host is infected by eating larval stages.

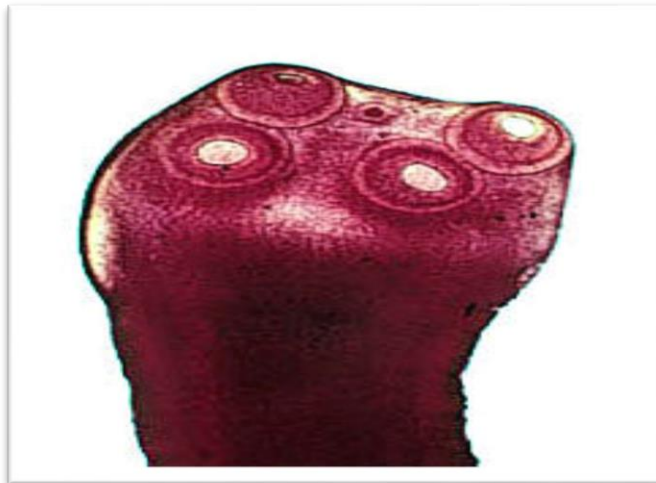
**Species : *Taenia multiceps***

Final host : small intestine of dogs and other carnivores ,

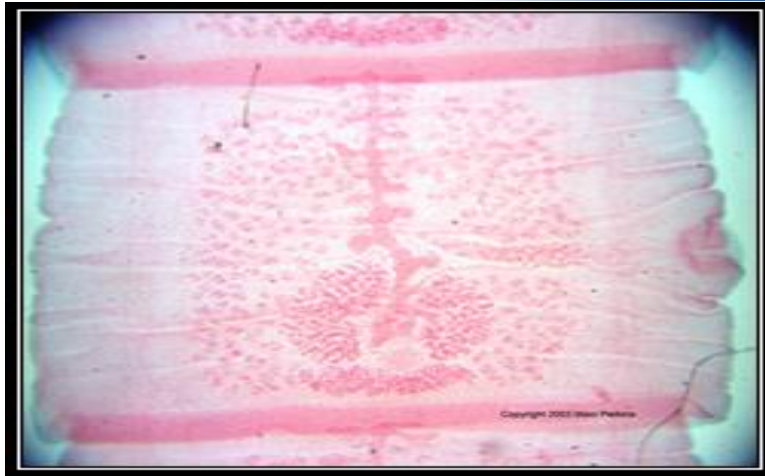
adult worm measuring 40-100 cm in length and have a small head holding 22-32 hooks

The larval stage is *Coenurus cerebralis* developed, in the brain and spinal cord of sheep and goat also cattle and another animals ( intermediate host) leading to gid disease in intermediate host

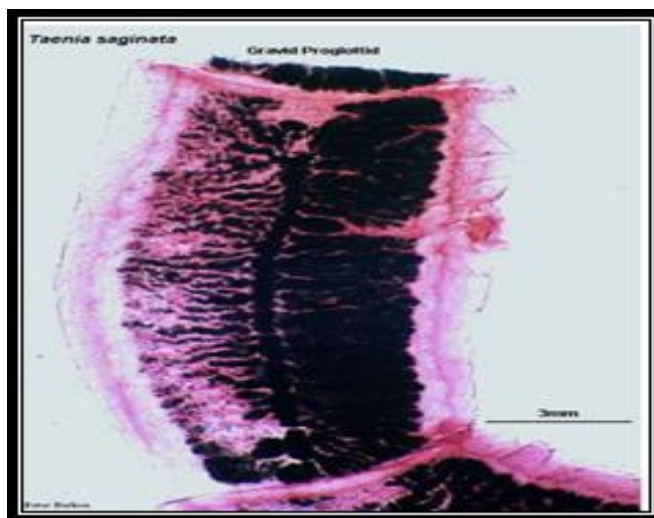
Final host (dogs) get infection by eating the larval stage .



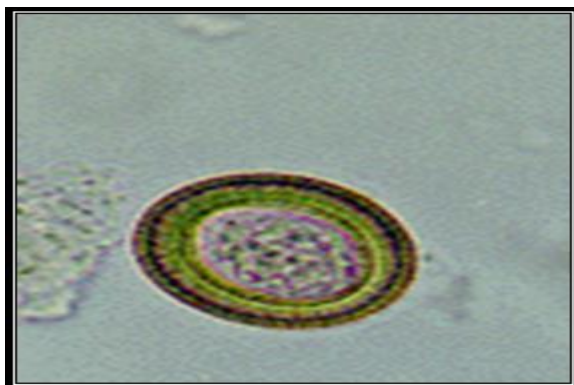
Scolex of *Taenia saginata*



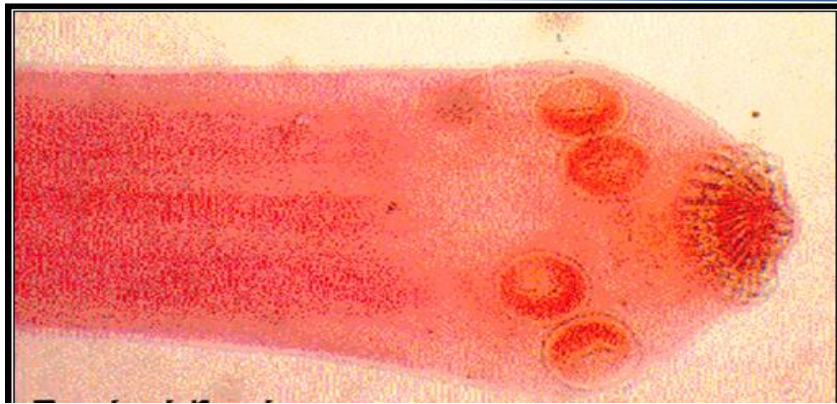
mature segment of *Taenia* spp



Gravid segment of *Taenia* spp



Egg of *Taenia* spp



*Scolex of Taenia pisiformis*

**Genus : Echinococcus**

**Sp. Echinococcus granulosus**

**Final hosts :** dog and many wild canids

Intermediate hosts : domestic and wild ruminants , man, pigs .

**Site :**

Adults worms are found in the small intestine of the definitive hosts and hydatid cysts mainly in liver and lungs of the intermediate hosts.

**Identification**

**Gross :**

The entire cestode is only about 2-7 mm long, and is therefore difficult to find in the freshly opened intestine. It consists of a scolex and three or four segments, the penultimate proglottids mature and the terminal proglottid is gravid and usually occupy about half the length of the complete tapeworm.

**Microscopic :**



The scolex has two rows of hooks. The ovary is kidney-shaped. Genital pores alternate irregularly and normally open on the posterior half of the mature gravid proglottids. The uterus of the gravid proglottids has well developed diverticula's .The egg is similar to that of *Taenia* spp egg (radially striated and containing a six-hooked onchosphere.)

### **Life cycle:**

The larval stage of *Echinococcus granulosus* is called hydatid cyst which present in the intermediate host (domestic ruminants, man, pigs, wild ruminants), the hydatid cyst settled mainly in the liver and lungs and also may be occur in the other organ of the body, the final host (dogs) infected by eating the organs infected with hydatid cyst while the infection in the intermediate host occurs by eating the food or water contaminated with the eggs.

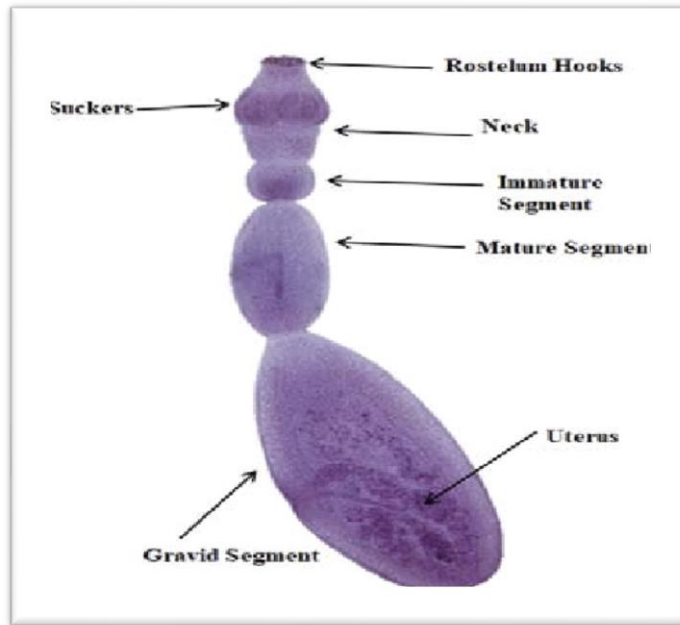
### **Diagnosis :**

#### **1. In the final host :**

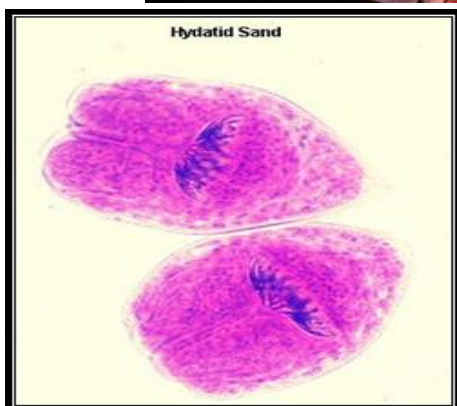
Fecal examination.

#### **2. In the intermediate host :**

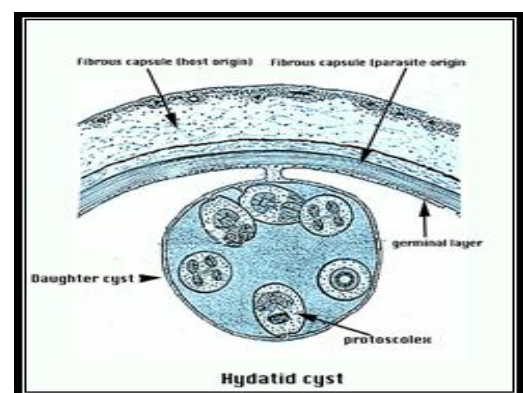
- a. Diagnosis of hydatidosis in domestic animals is rarely made ante-mortem.
- b. Serological test



*ECHINOCOCCUS granulosus*



Protoscolices



Hydatid cyst

**University of Mosul**  
**Lecture No.:**  
**College of Veterinary Medicine**  
**Date:**  
**Unit of Scientific Affairs**  
**Website:**

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