

Practical Parasitology

Parasites affecting musculoskeletal system

- **Objectives**

- By the end of this practical the students should:

- ☐ **Illustrate** the life cycle *and* morphology *Trichinella spiralis*.
- ☐ **Describe** the the life cycle *and* morphology Sarcocystis.
- ☐ **Illustrate** the life cycle *and* morphology of *Sparganosis*.
- ☐ **Describe** the the life cycle *and* morphology cysticercosis.
- ☐ **Illustrate** the the life cycle *and* morphology of American trypanosomiasis



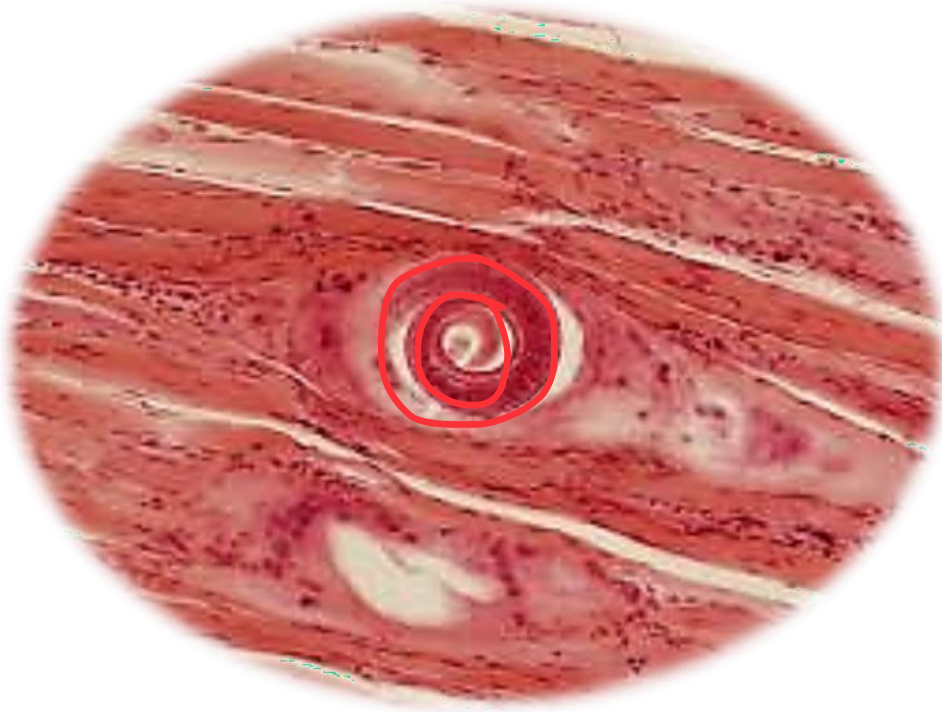
Parasites affecting muscles:

- 1-**Nematoda**: *Trichinella spiralis*
- 2-**Cestoda**: sparganosis, cysticercosis.
- 3-**protozoa**: sarcocystosis, toxoplasmosis, chagas disease

Trichinellosis.

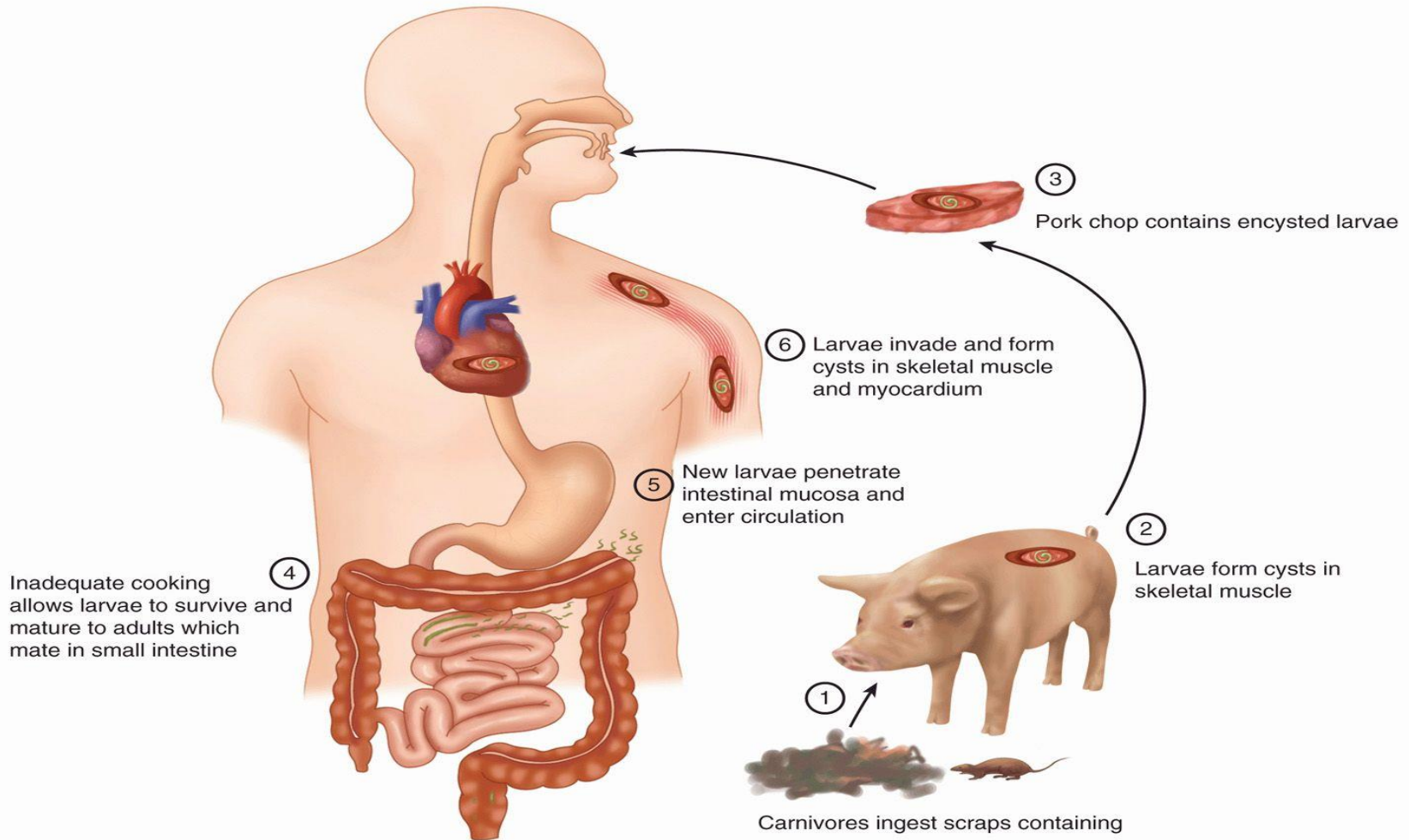


دايرة في السلايد



Distribution

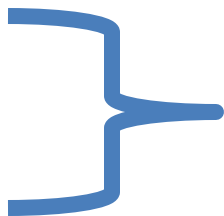
Cosmopolitan especially in pork eating countries



Habitat

D.H.

I.H.



small intestine

pig , rat & man

Trichinella spiralis

- ▶ **Morphology:**

- ▶ **1 – Adult**

Attenuated anterior end. – Cellular esophagus

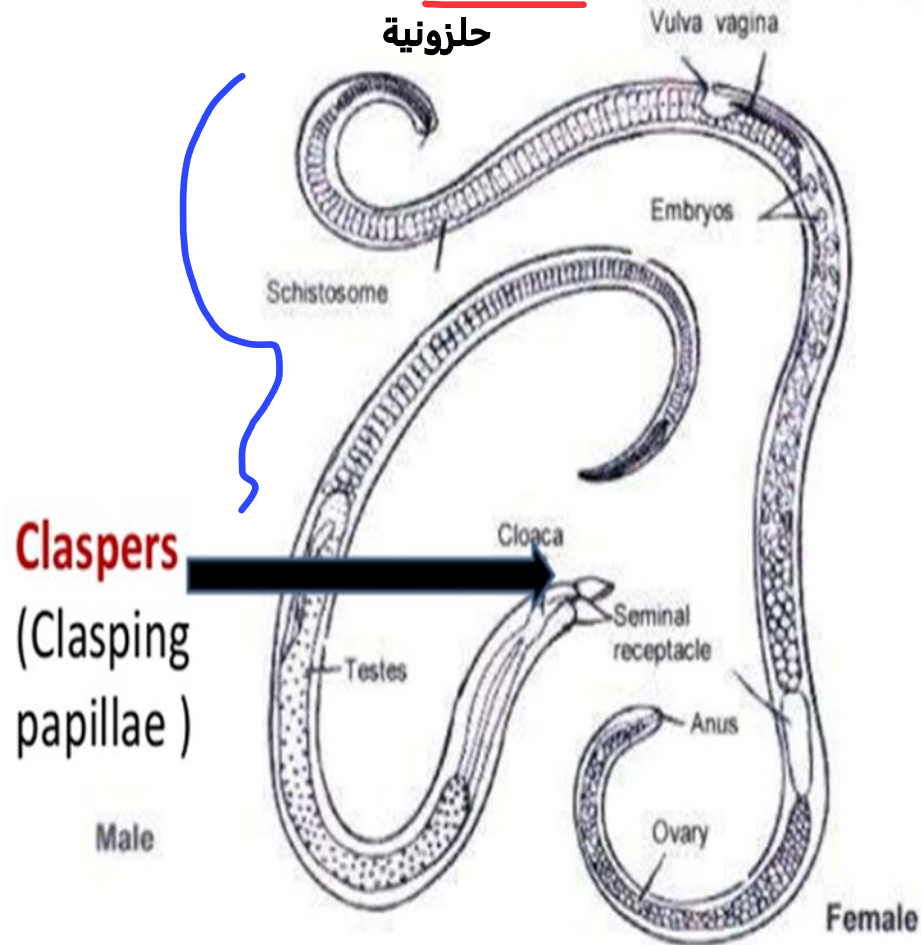
Male: 1.5mm

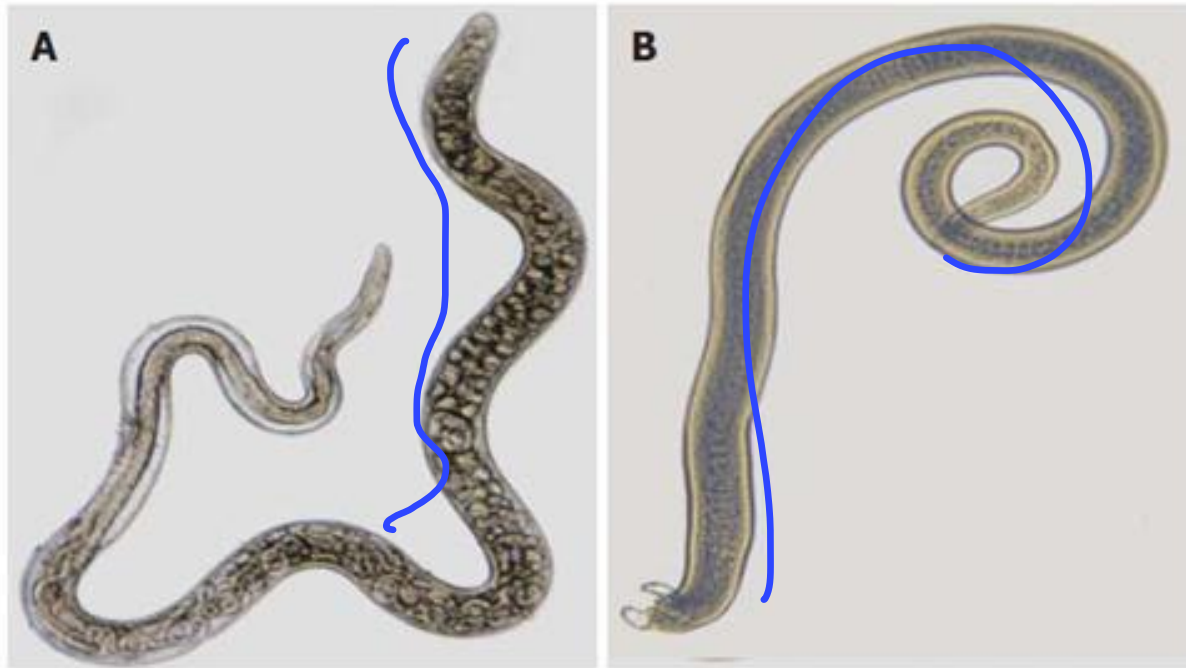
post.end curved ventrally, 2 caudal papillae

Female: 3.5mm

post.end bluntly rounded, vulva open at
junction of ant. Fifth with rest of body

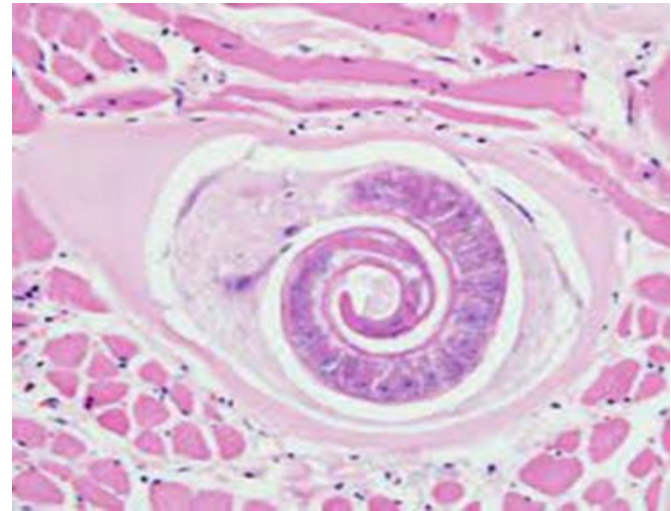
Trichinella spiralis- Morphology



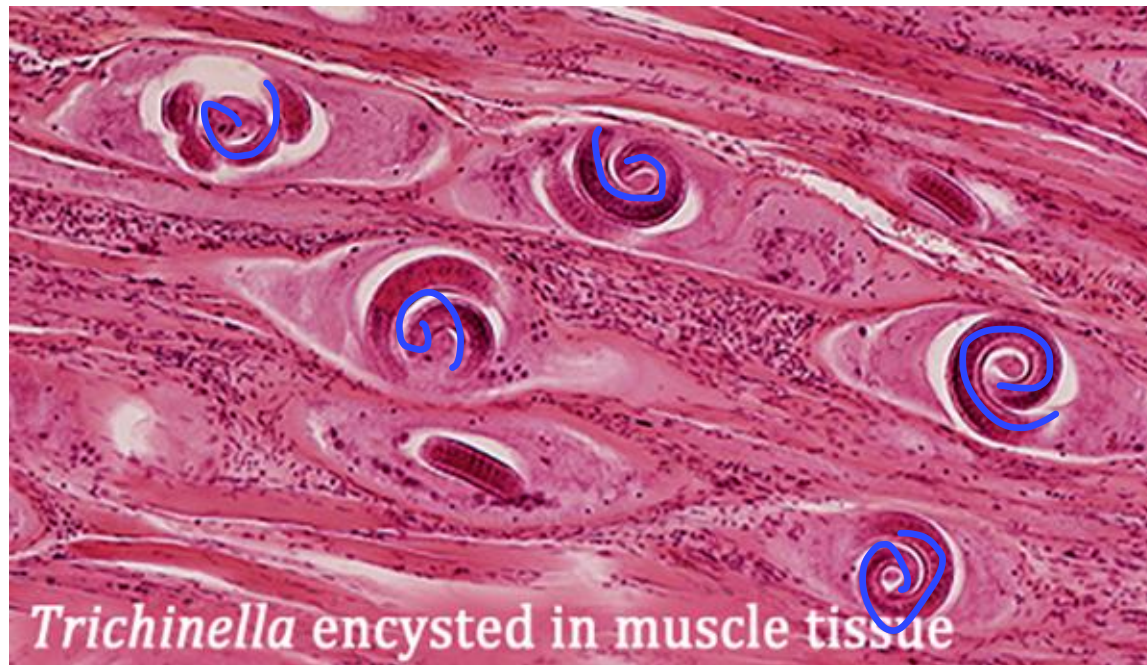
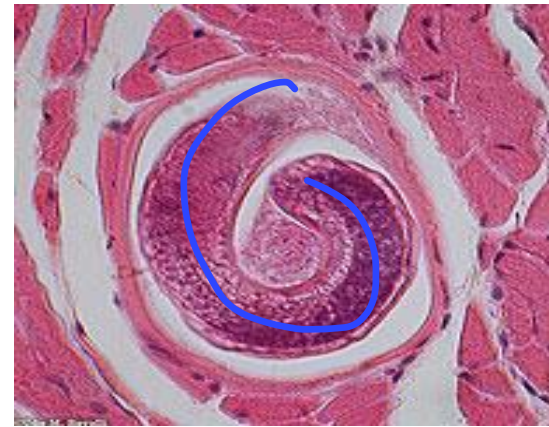
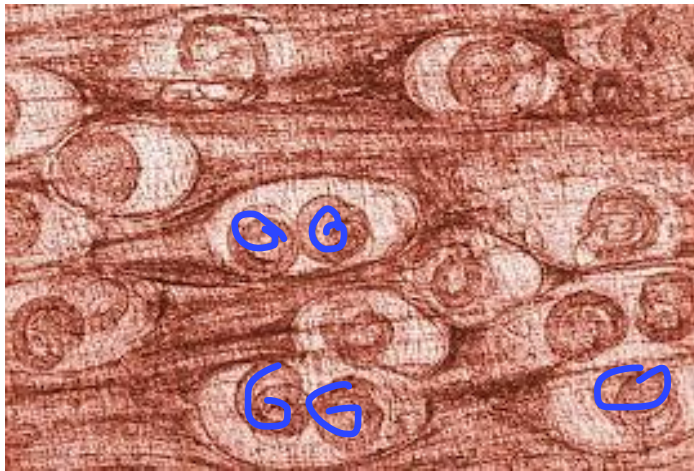


Male and female trichnella spiralis adult

Encysted larva: larva 1 mm coiled inside cyst lies along the longitudinal axis of muscle fibers surrounded by a fibrous capsule.



Trichinella capsule (infective & diagnostic stage)

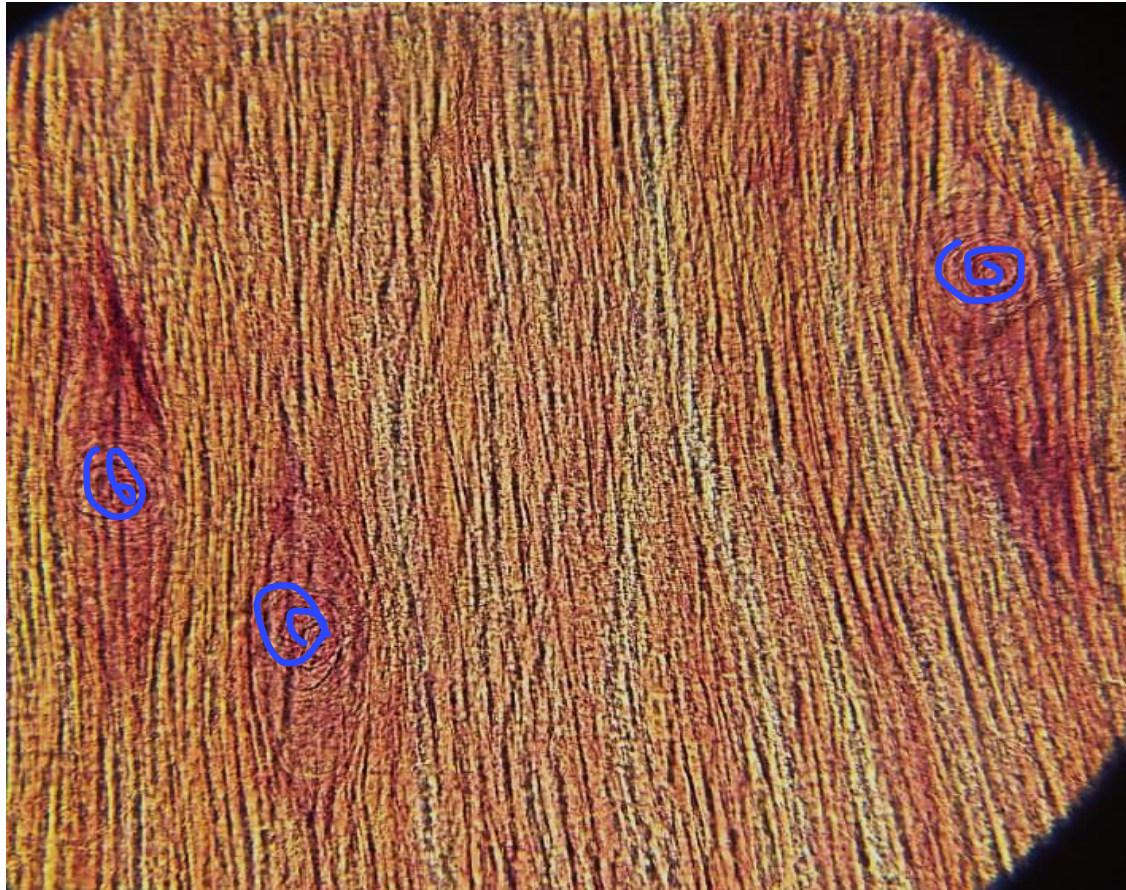


Trichinella encysted in muscle tissue

Encapsulated *Trichinella spiralis* larvae in the muscle.

SS 0

T.Spiralis Encysted larva



Pathological and Clinical effect of

Trichinella spiralis



Myalgia



حول **Periorbital oedema**

عین



خط **Splinter hemorrhages**

Muscular Sarcocystosis

Muscular Sarcocystosis

Distribution: World wide.

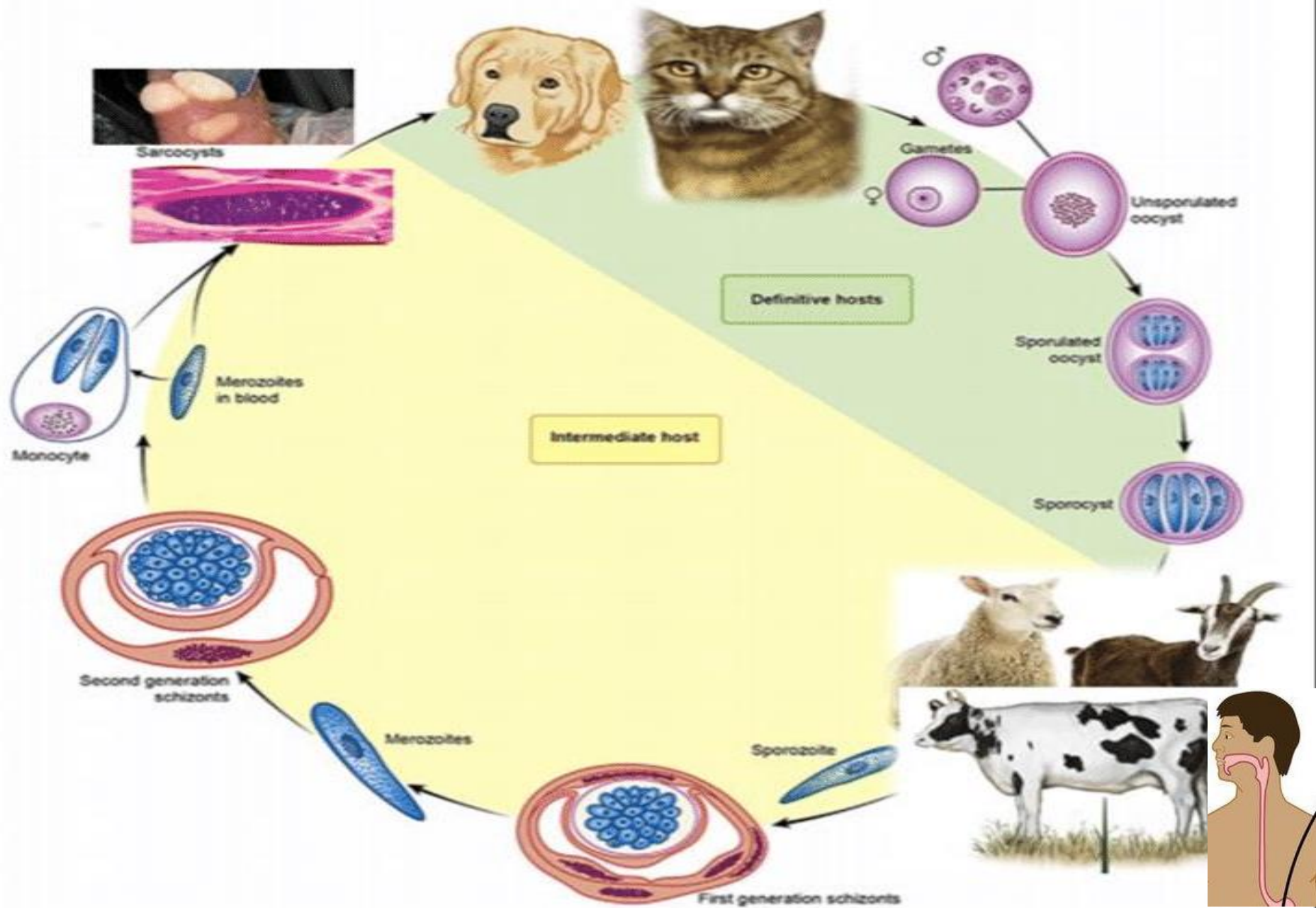
Habitat: intestine , muscles.

D.H:

carnivorous animals (dogs& cats) harbour the sexual stages (gametogony) ending by the formation and passage of oocysts in their stool.

I.H:

Man and herbivorous animals; cattle, sheep & pigs harbour the asexual stages (schizogony) ending by formation of tissue cysts in striated muscles.



-***Sarcocystis lindemanni***: It causes muscle sarcocystosis in man (man is intermediate host).

Morphology:

-**Oocyst (mature)**: Oval in shape, 30x15 μm , surrounded by clear double-layered wall. It is disporocystic tetrazoite.

-**Cyst(sarcocyst)**: It contains bradyzoites (crescent shaped forms with various developmental stages).

Sarcocystosis

اتنين حرامية سرقوا

Sarco

Sarcocystis species oocyst

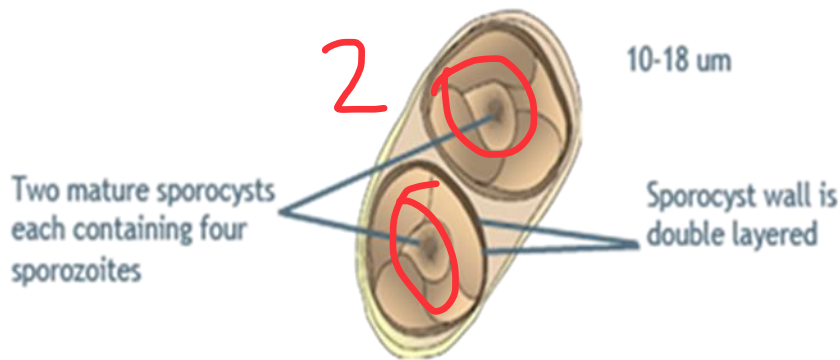
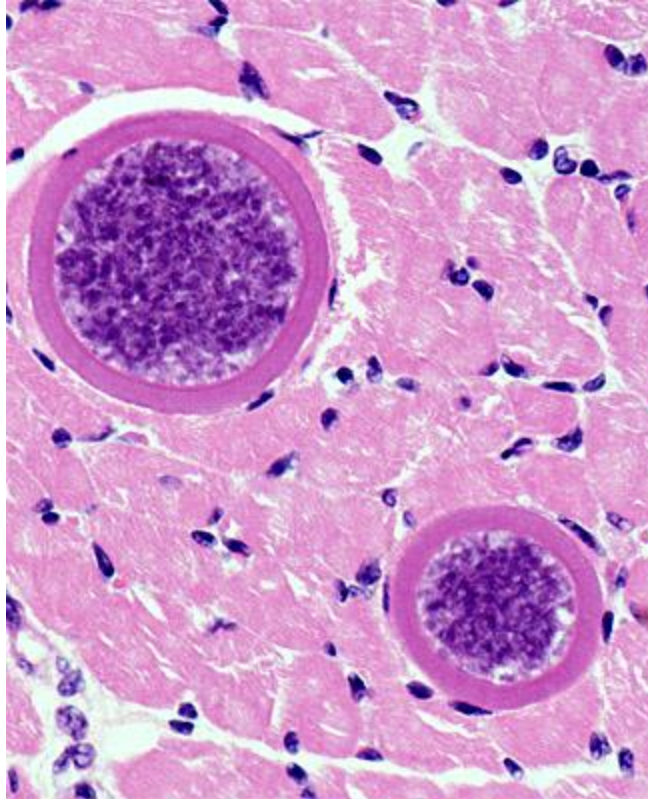


Illustration by Wilson Vientos

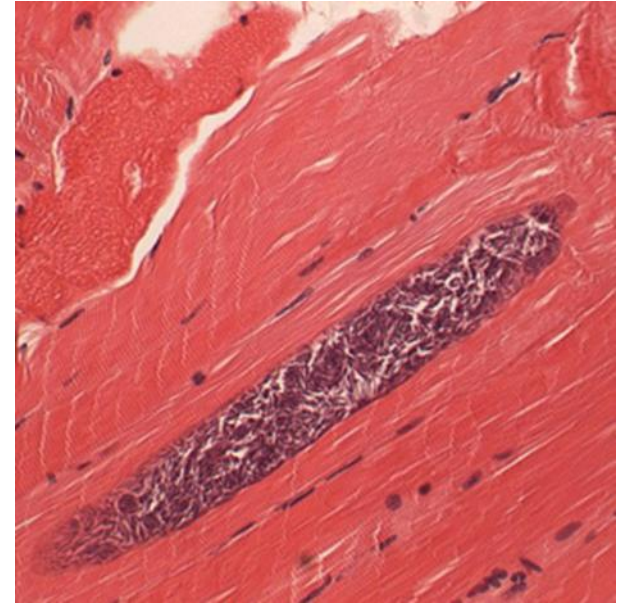


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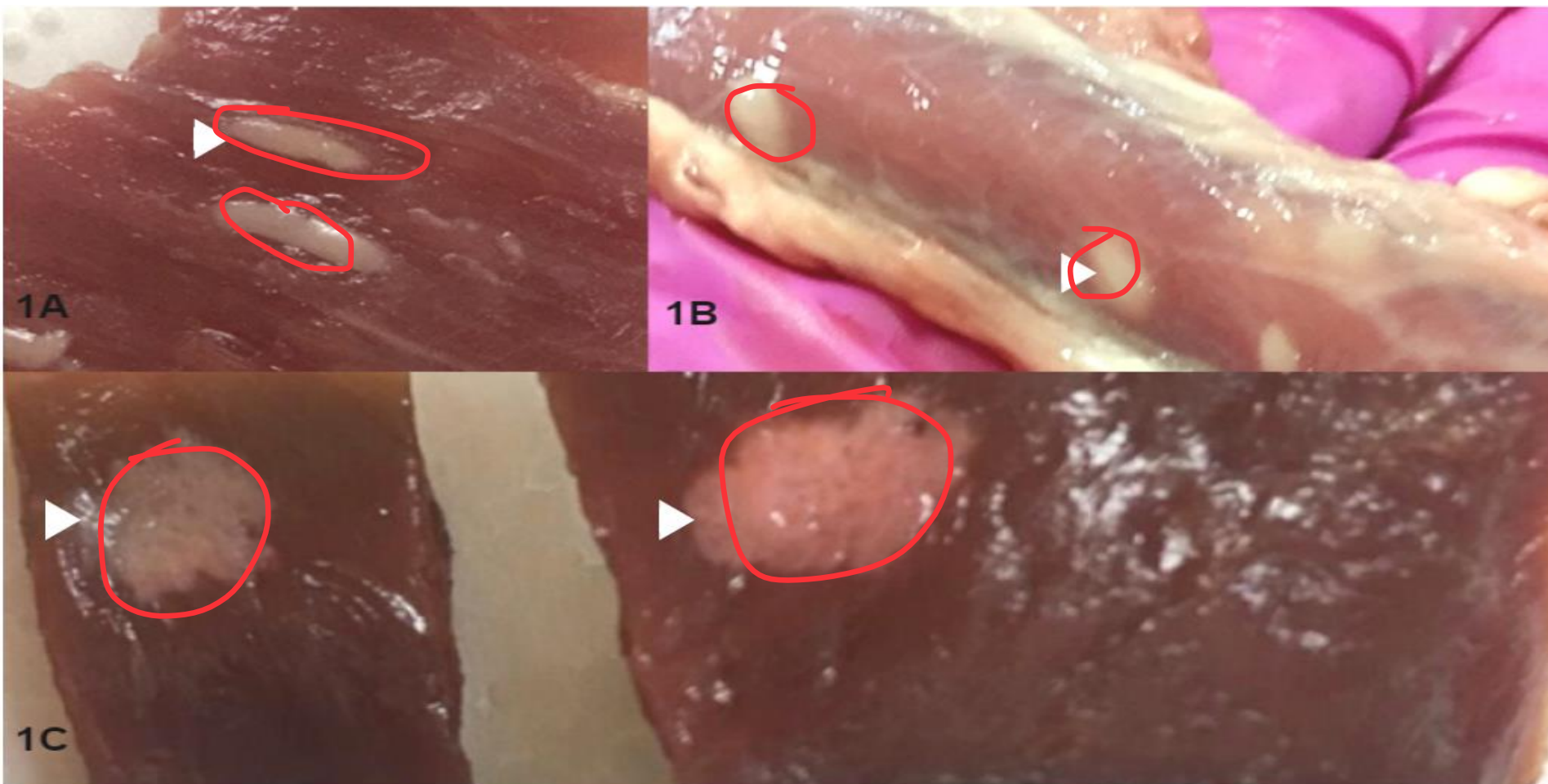
Oocysts of Sarcocystis: measure 30x15 long by 15-20 μm wide contain disporocystic tetrazoit



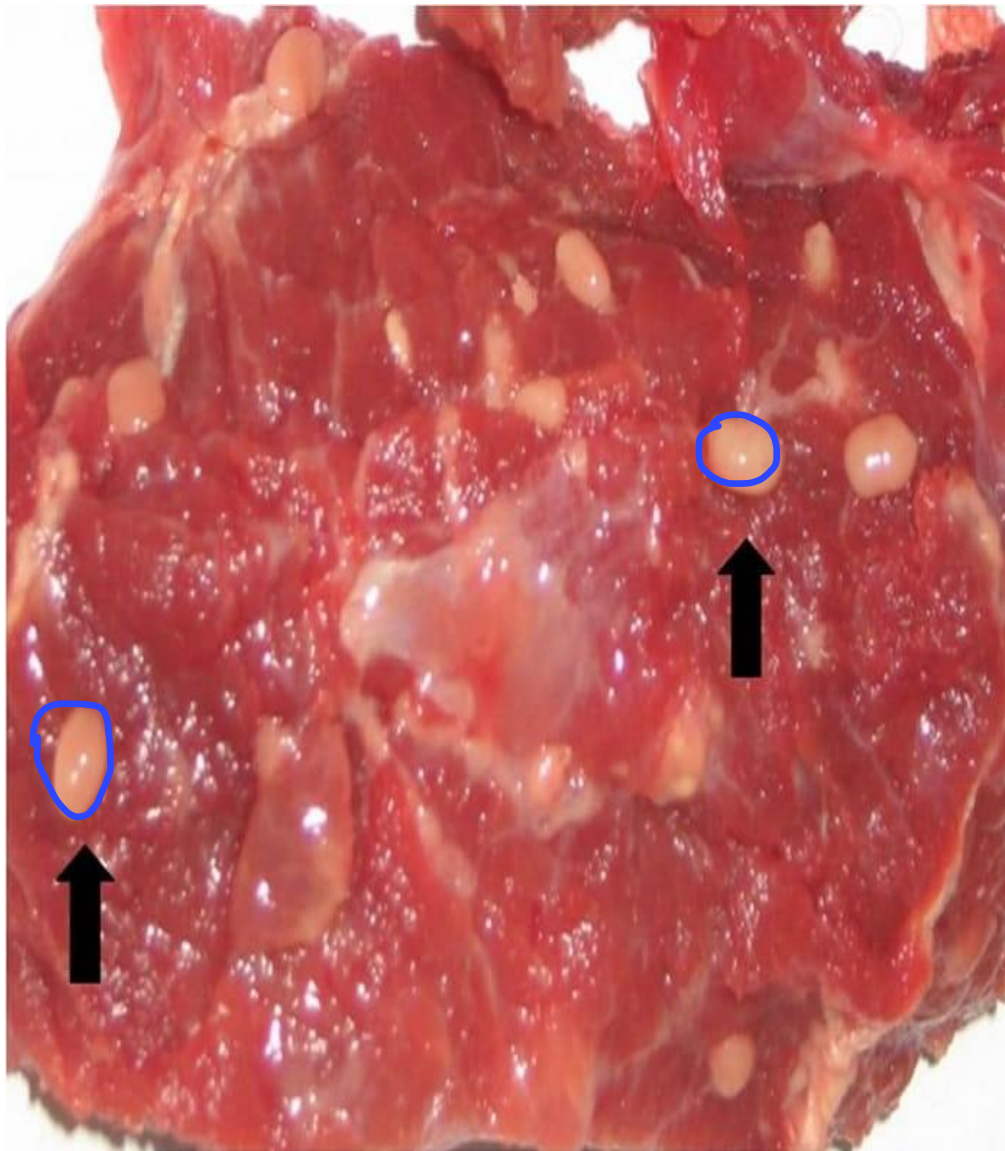
2



Sarcocysts in tissue; contain numerous bradyzoites. Sarcocysts are usually found in skeletal or cardiac muscle.



Sarcocystosis in ruminants. (1A) In the diaphragm of sheep; (1B) In the esophageal muscle of sheep; (1C) heart, tissues of cattle, presenting irregular white-yellow lesions



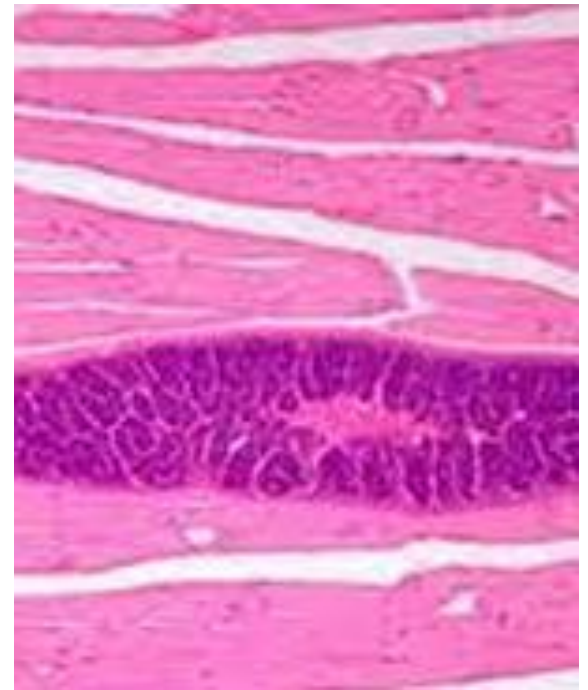
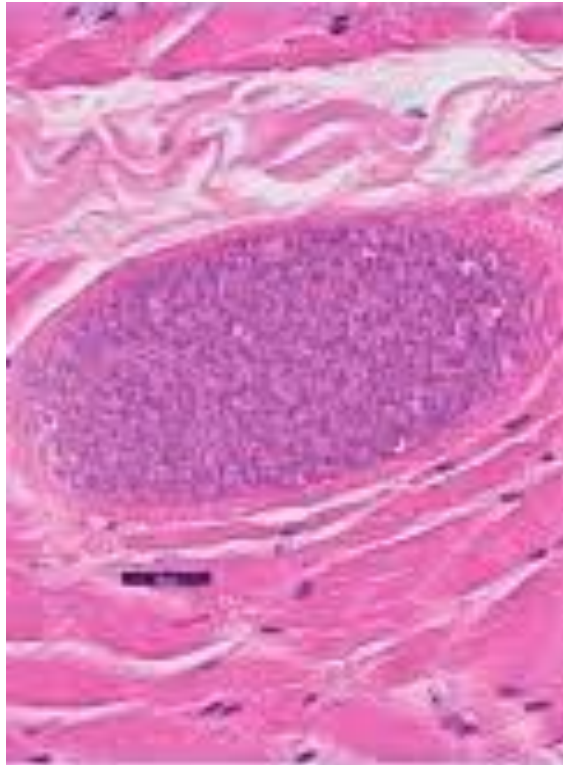
Sarcocystosis in animal muscle

Muscular Sarcocystosis

2

Oocyst in stool
(Infective stage)

Sarcocyst in muscle (Diagnostic stage)



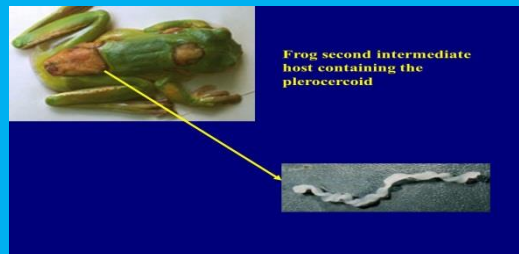
Sparganosis

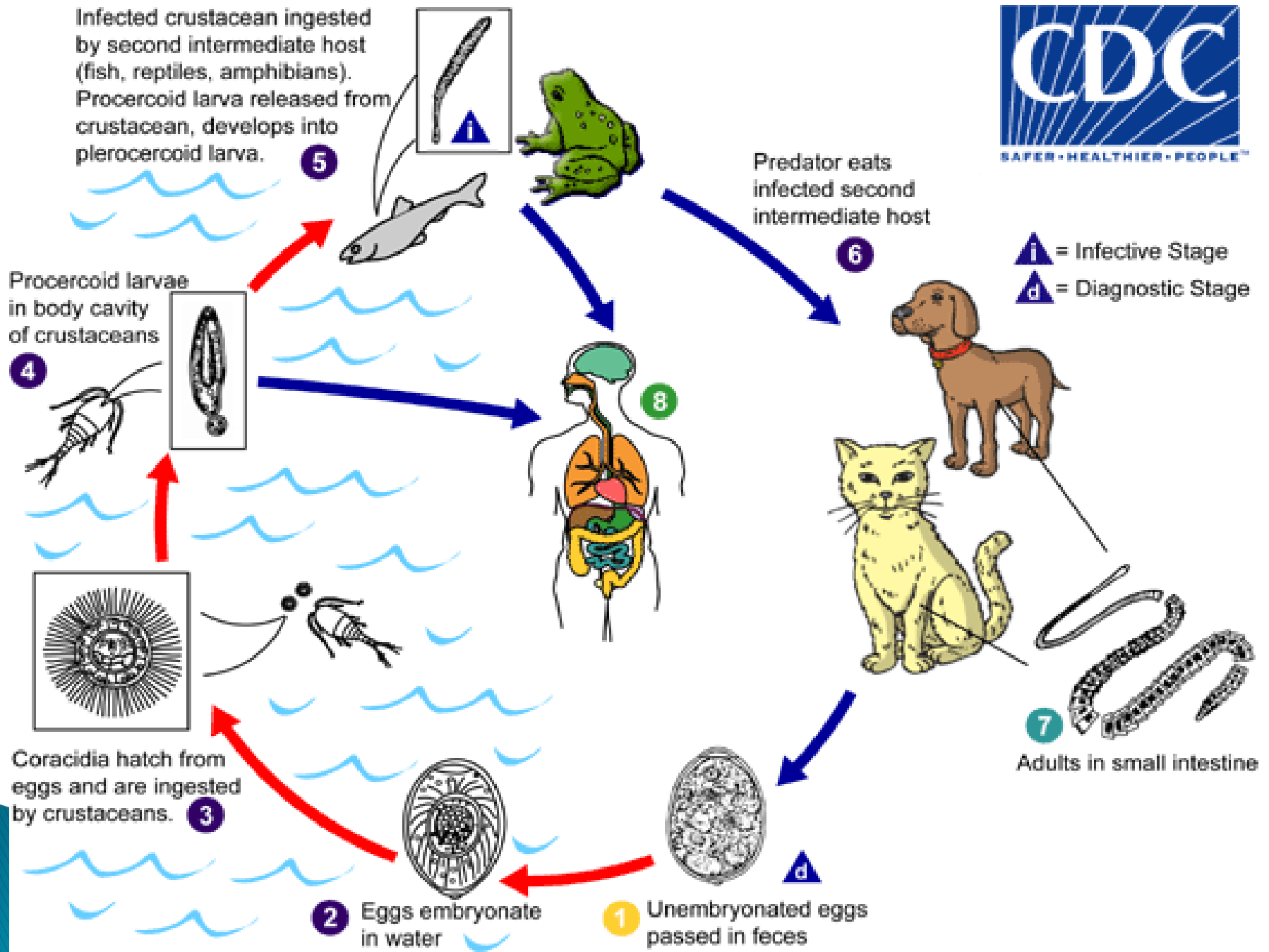
Sparganosis

Def.: Invasion of the human tissue by larval stage of *Diphyllobothrium mansonii* (*Sparganum mansonii*)

Mode of infection:

- Drinking contaminated water with **water flea** containing **proceroid**
- Ingesting raw **snakes or frogs** containing **plerocercoid**.
- Application of **a poultice made of** flesh amphibians and reptiles **containing a living plerocercoid** to inflamed or ulcerated skin.

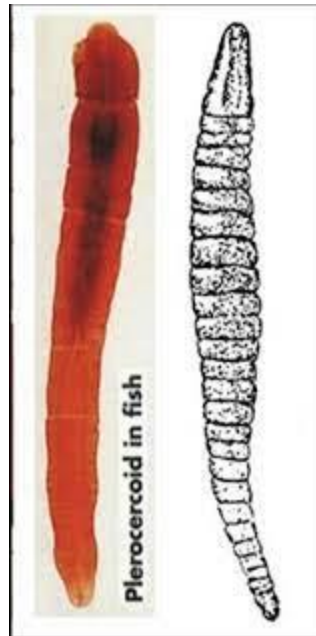






طويلة أوى يا Bro

Proceroid (first stage larva): This is a solid elongated organism about 0.5mm with a spherical caudal end having 6-hooks.

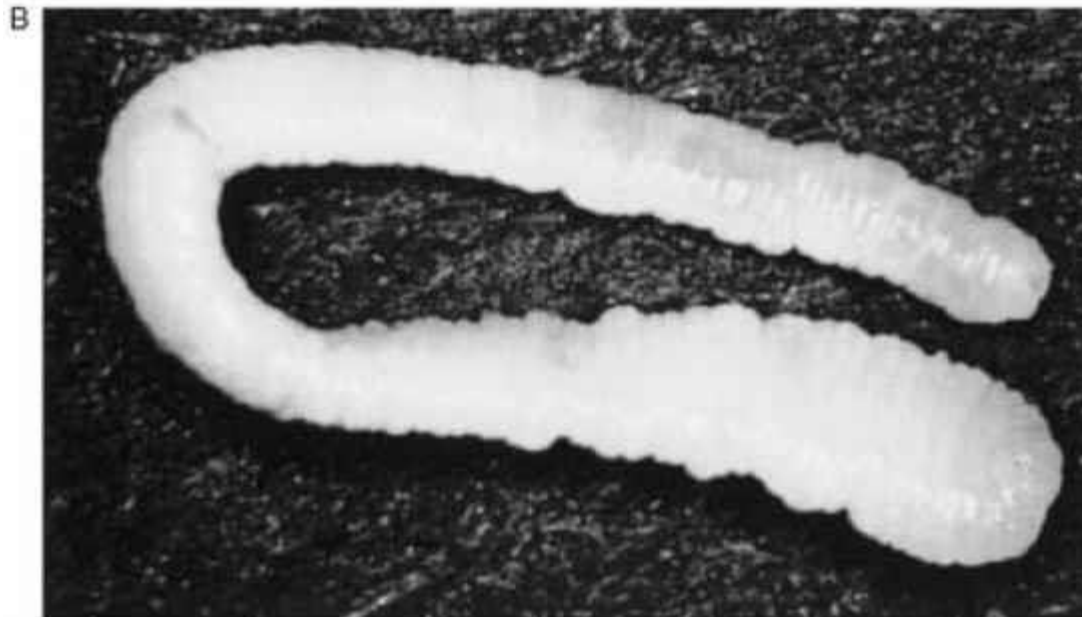
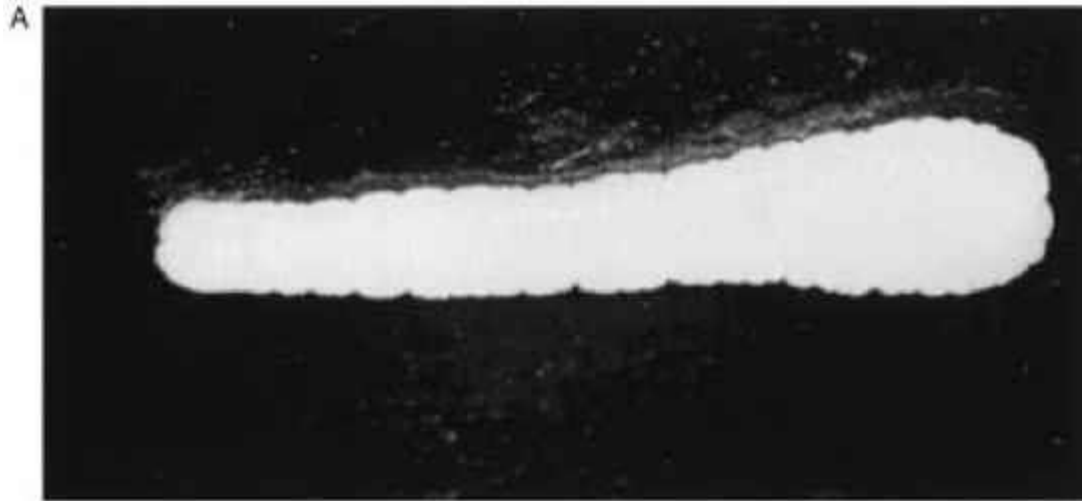


Plerocercoid (second stage larva): This is a solid elongated organism 1-2cm with invaginated anterior end. The body is striated but not segmented.



Plerocercoid

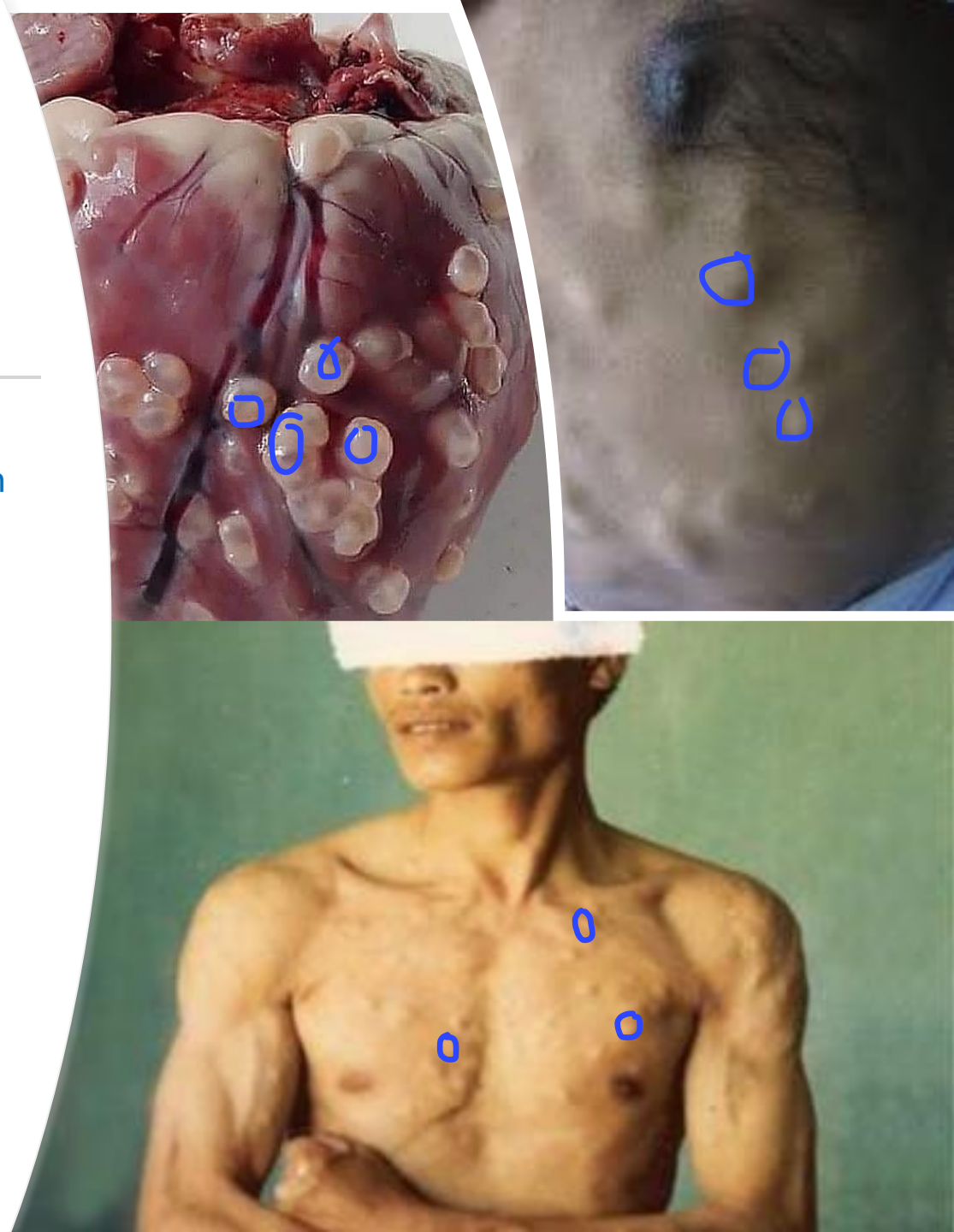
(A) Plerocercoid larva of *D. mansoni* (~8mm). (B) Plerocercoid larva of *D. manosi* (~15mm)



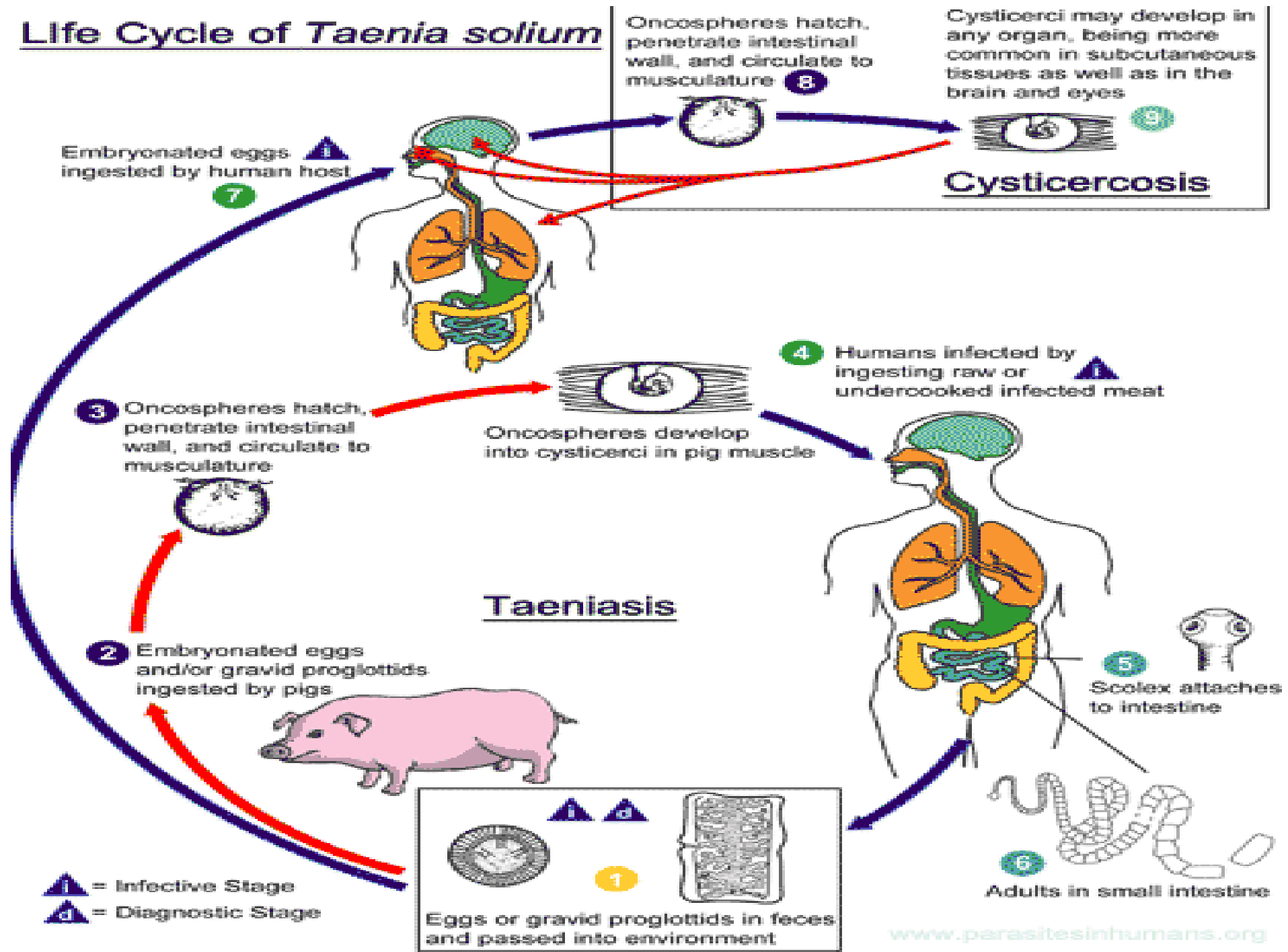
Cysticercosis

أكياس

Distribution Cosmopolitan especially in pork eating countries

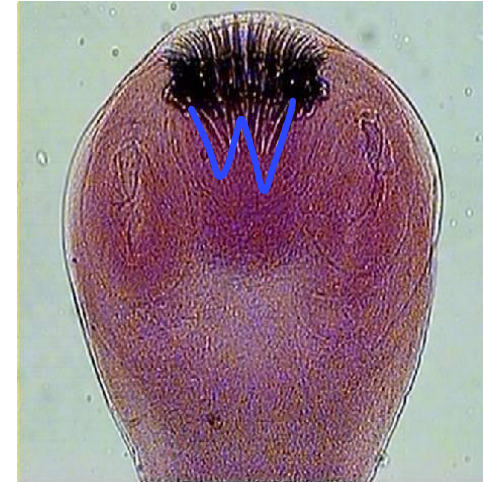


Life Cycle of *Taenia solium*

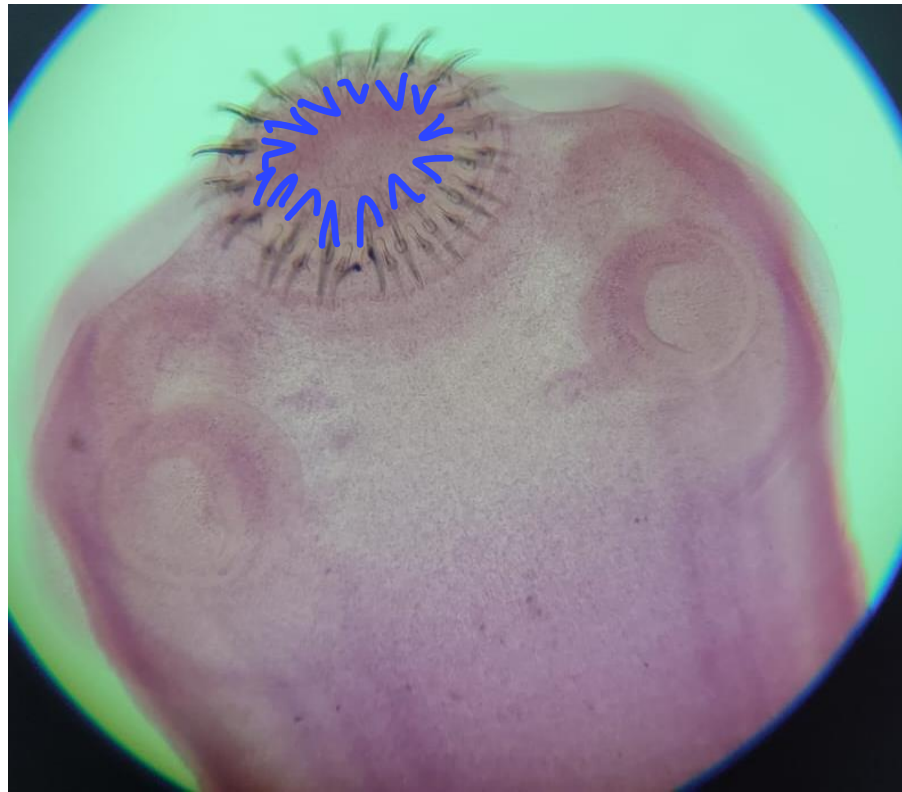


Taenia solium adult

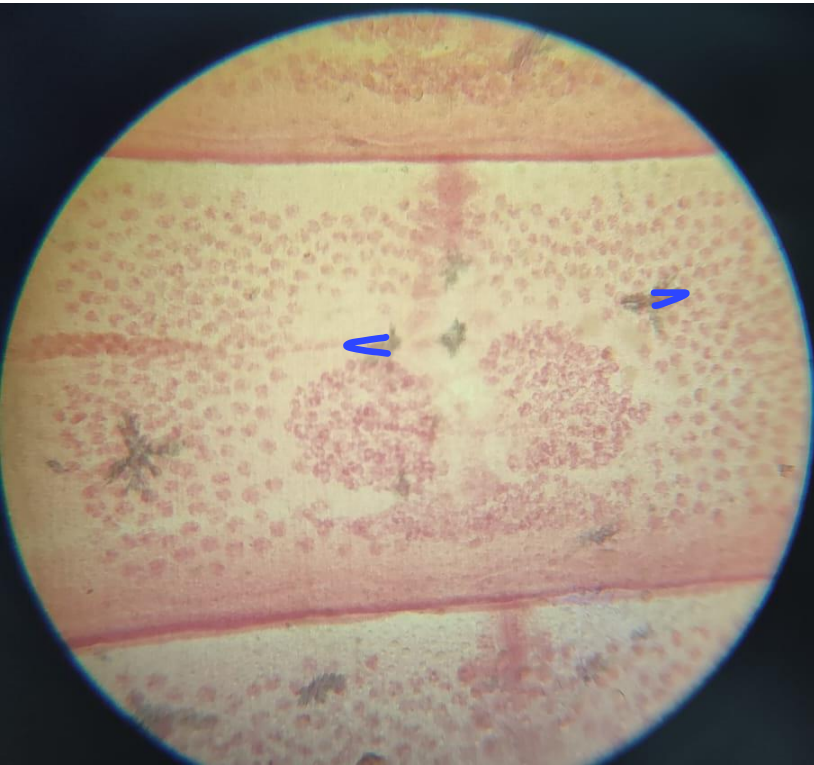
شوك



Scolex of Taenia solium



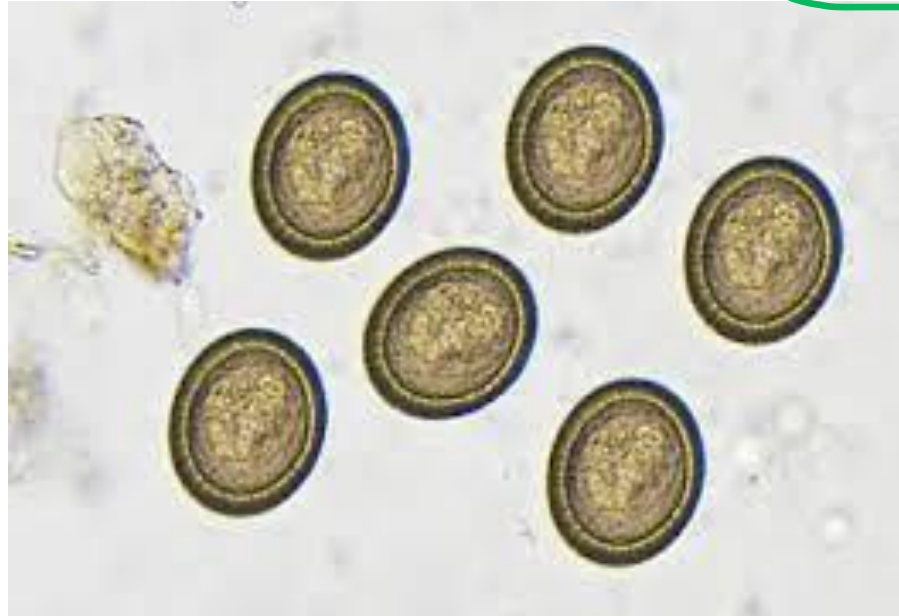
Mature segment of *Taenia*



Eggs of *Taenia*

(Infective stage in cysticercosis)

جنيہ مصری



Taenia solium egg :measure 30-35 micrometers in diameter and are radially-striated. The internal oncosphere contains six refractile hooks.

Egg of *Taenia*



جنيہ مصری



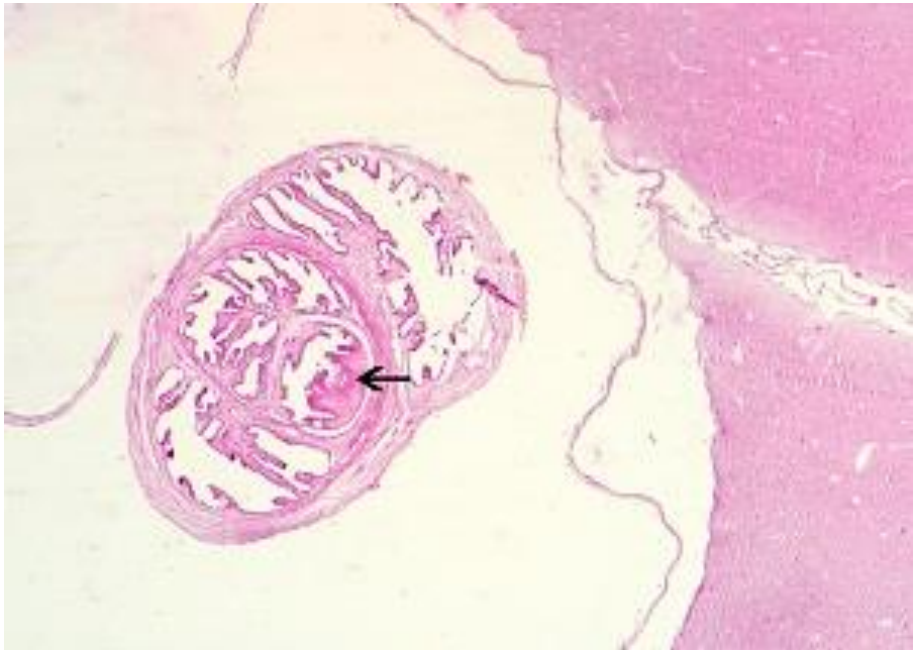
Cysticercus cellulosae (diagnostic stage)



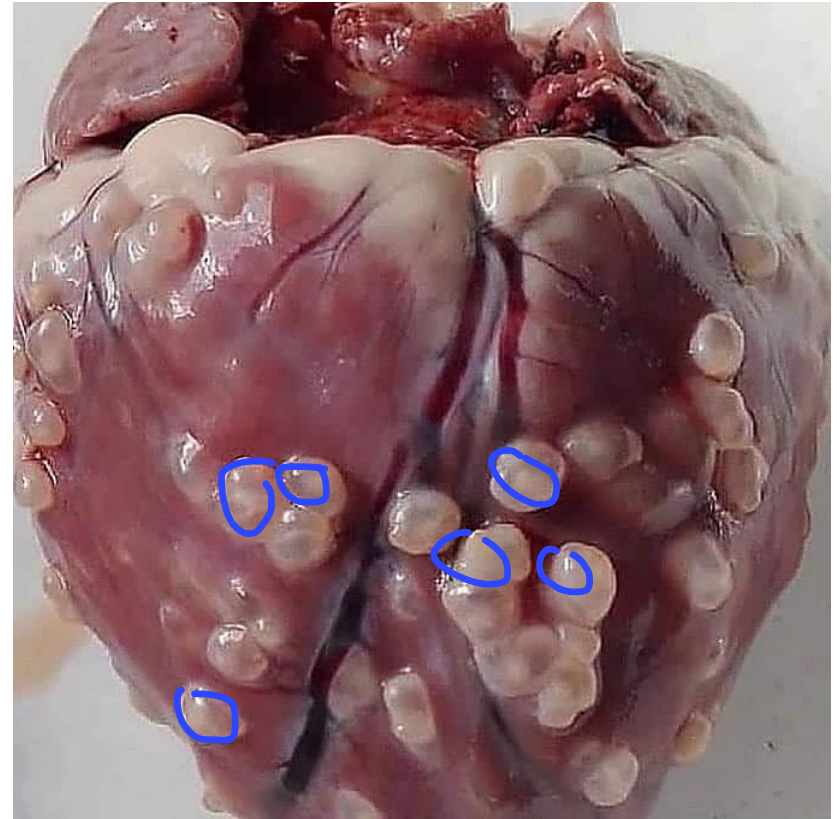
Cysticercous cellulose



Cysticercosis in muscle



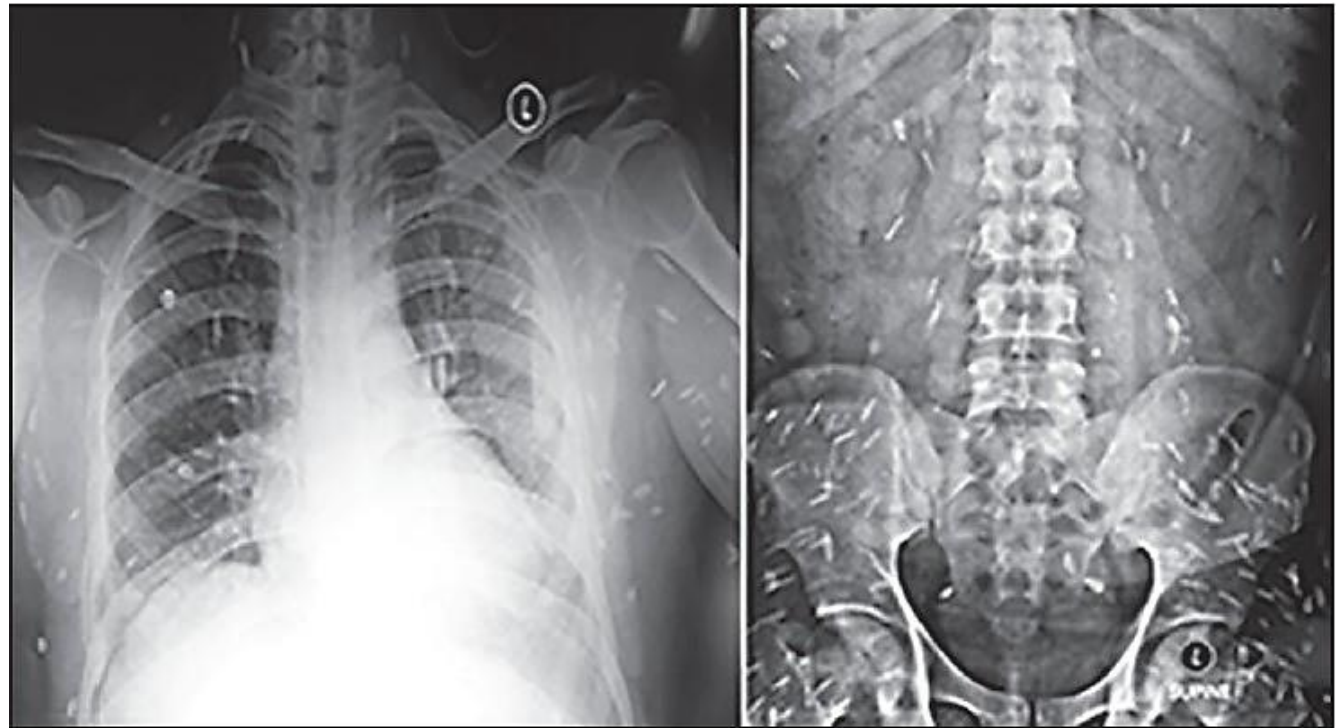
the cysticercus shown in figures. The invaginated scolex and hooks are indicated (arrow).



Cysticercosis

Plain radiograph of chest and abdomen showing radiopaque lesions in the muscles and subcutaneous tissues giving rice grain appearance

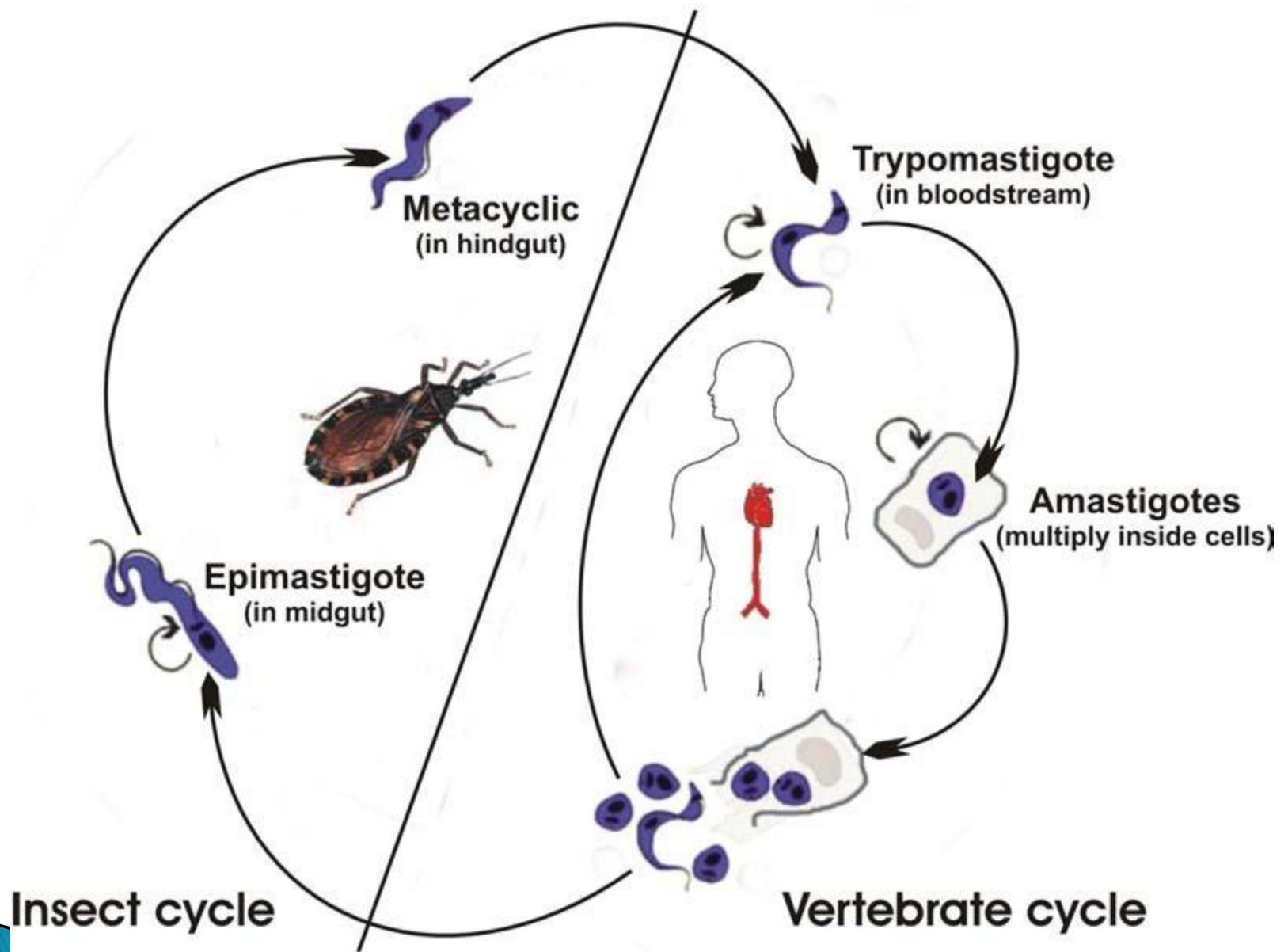
Rice-grain or cigar-shaped calcification is **ovoid-shaped calcification in soft tissues, particularly muscles**. It is characteristic of infection with *Taenia solium* (cysticercosis).

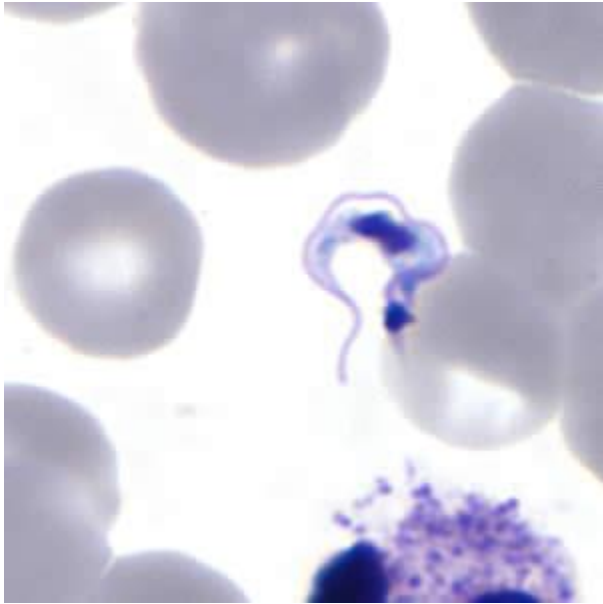


American trypanosoma

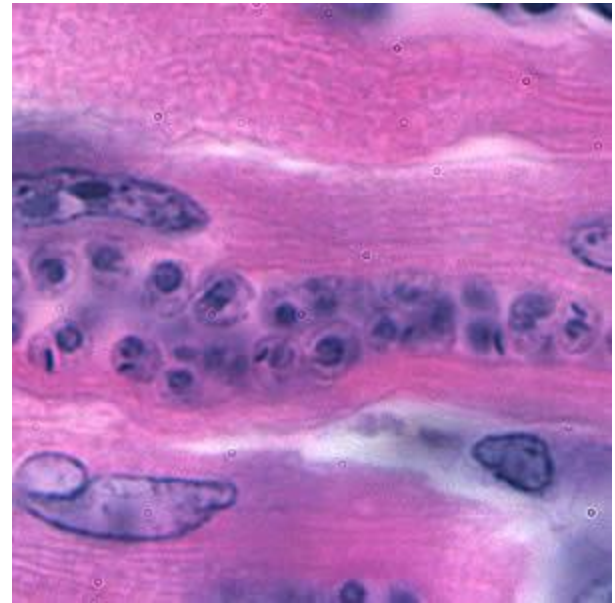
Chagas Disease (American Trypanosomiasis)







Trypomastigote : a large, subterminal or terminal kinetoplast, a centrally located nucleus, an undulating membrane, and a flagellum running along the undulating membrane, leaving the body at the anterior end.

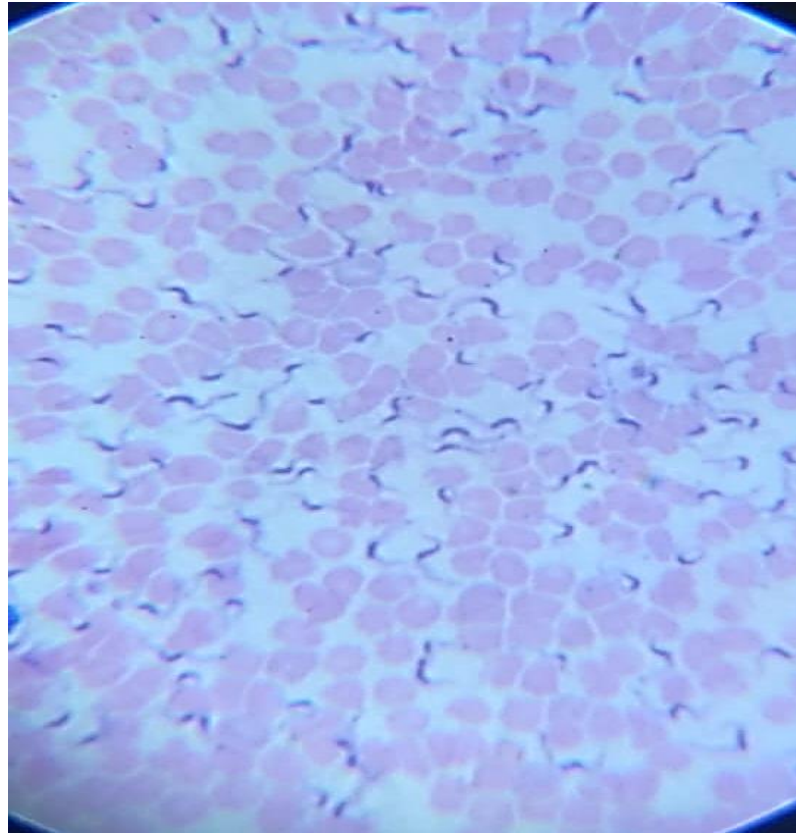


Trypanosoma cruzi amastigotes in heart tissue.

Polymprphic Trypanosome (Trypomastigote in blood)



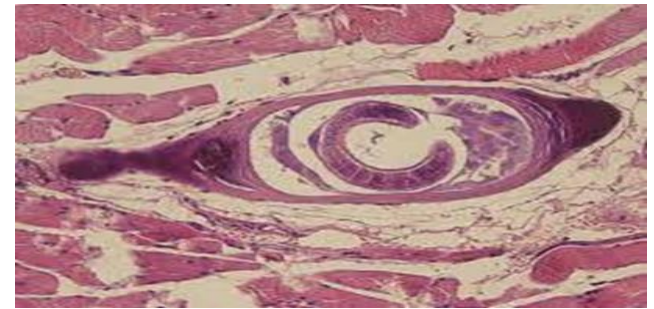
اشكال كثير = دود كثير





-Identify

.....



**-The clinical presentation
caused by this parasite is**

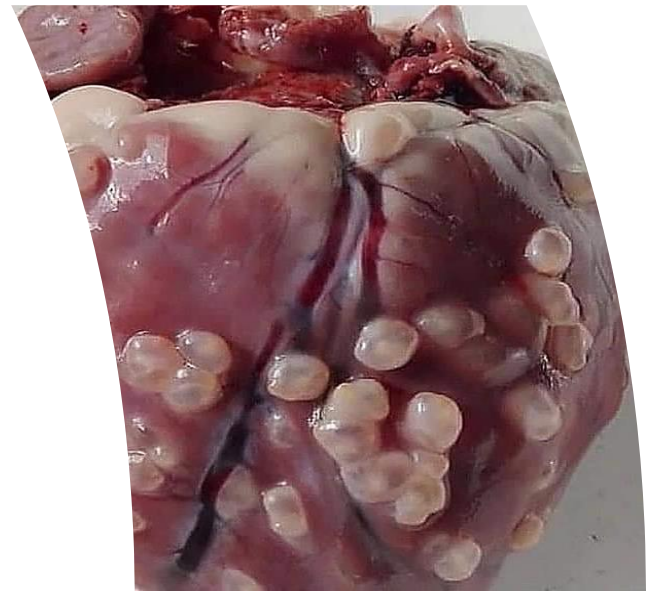
-.....

-.....



-Identify

.....



-The causative parasite is

.....

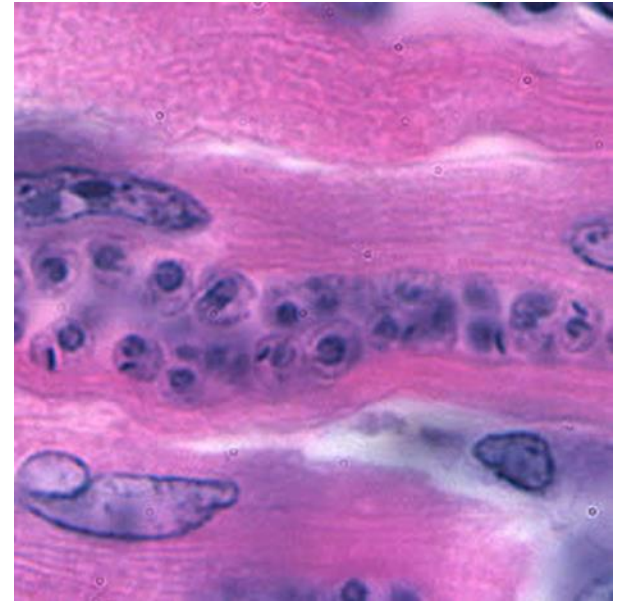


-Identify

.....

-The causative parasite is

.....



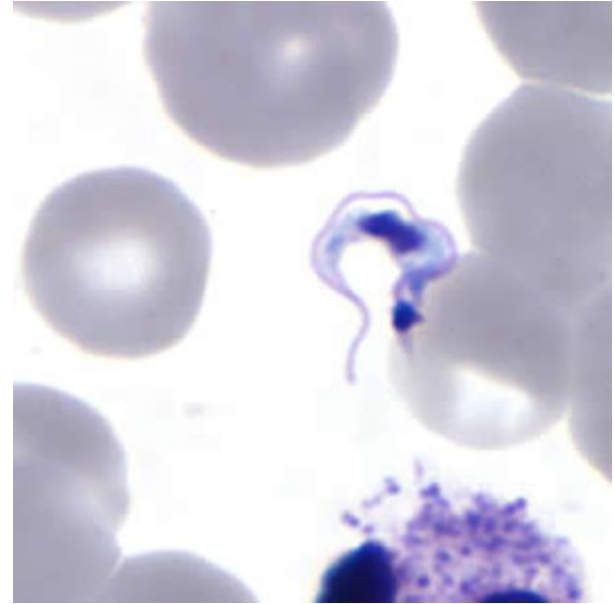
-Identify

.....

-two identification
charactaresitcs

-.....

-.....



THANK YOU

