Introduction

* كونها بتشبه الـ tape / الشريط ← أخذت الاسم العام المشهور الها (الدودة الشريطية).

- Cestodes are long, ribbon-like helminths that have gained the common appellation of tapeworm from their superficial resemblance to sewing tape. (بتشبه الشريط)
- Their appearance, number, and exaggerated reputation for inducing weight loss have made them the best known of the intestinal worms. * بسبب مظهرها وعددها و حجمها الكبير (خاصية مميزة) بالإضافة انه لما توخذ غذائها من الجسم بتسبب فقدانه للوزن بسرعة.
- Like all helminths, tapeworms lack vascular and respiratory systems. They are devoid of both gut and body cavity. Food is absorbed across a complex cuticle, and the internal organs are embedded in a solid parenchyma. * فما عندها مجوفة من الـ organs مزروعة بالـ tissue تبعها.
- The adult is Divided into scolex (1), neck (2), and segmented (3) body parts. Each segment is a hermaphroditic unit releasing eggs via rupture or through uterine pore.

* cuticle = جلد

* scolex = head.

* الجسم تبعها مكوّن من ٣ أجزاء.

* عندها الـ male & female organs في نفس الـ segment.

- Important species:
  1. *Taenia saginata*
  2. *Taenia solium*
  3. *Diphyllobothrium latum*
  4. *Hymenolepis nana*
  5. *Echinococcus granulosus*

مختصين GIT بال infection فقط

mixed (مرات بكونوا tissue بال GIT ومرات بال)

بتركزوا ال GIT وبعضوا على ال tissue (زي ال muscles).

- The eggs of the genus *Taenia* possess a solid shell and contain a fully developed, six-hooked (hexacanth) embryo.

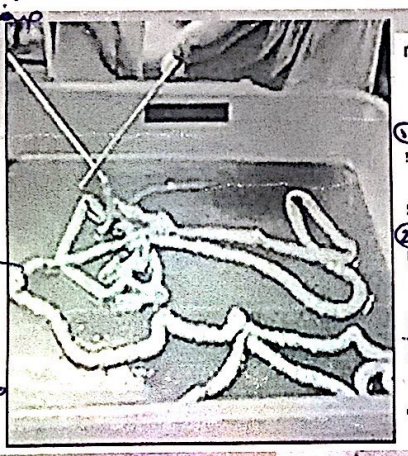
* بويضة دائرية الشكل الها غطاء solid, thick وفيها embryo مجهز مقسم لـ ٦ أجزاء بسبب hexacanth.

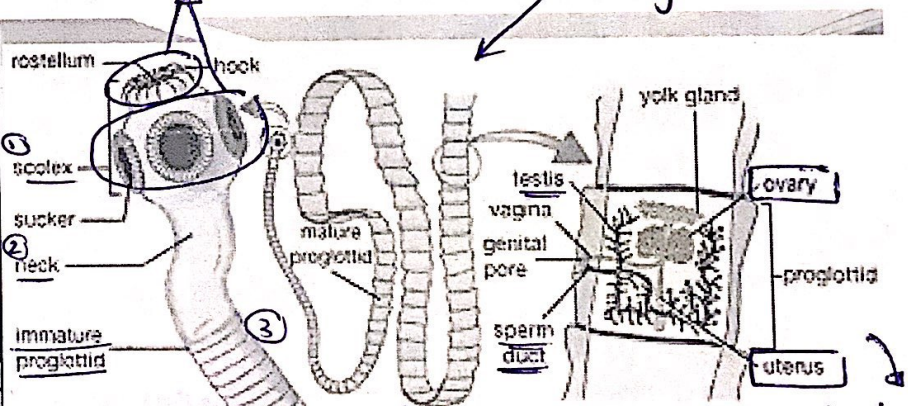
- The eggs of *Diphyllobothrium latum*, in contrast, are immature at the time of deposition and possess a covered aperture, or operculum, through which the embryo exits once fully developed.

← بدها فترة full maturation وبصير عندها فتحة (aperture) صغيرة بطلع منها ال embryo لما يكمل تطوره.

هاي تستخدم من ال absorption.

* ال segments بتبش صغيرة وكل ما تنزل تحت بتصير larger

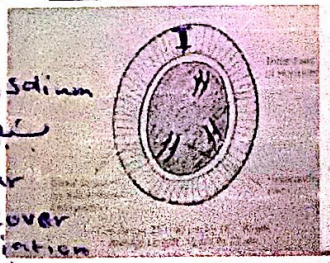


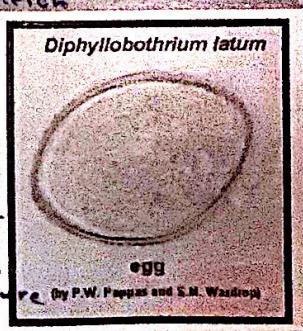


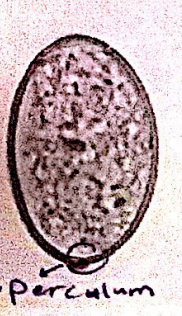
long ← بكمل بوصل لقصار وفيها بوصل لـ (10 m).

* منلاحظ وجود male & female organs من ما ذكرنا.

- eggs ال
  - Saginata & Solium بشبهوا بعض
    - → circular
    - → thick cover with irradiation (مش واضح)
    - → mature embryo

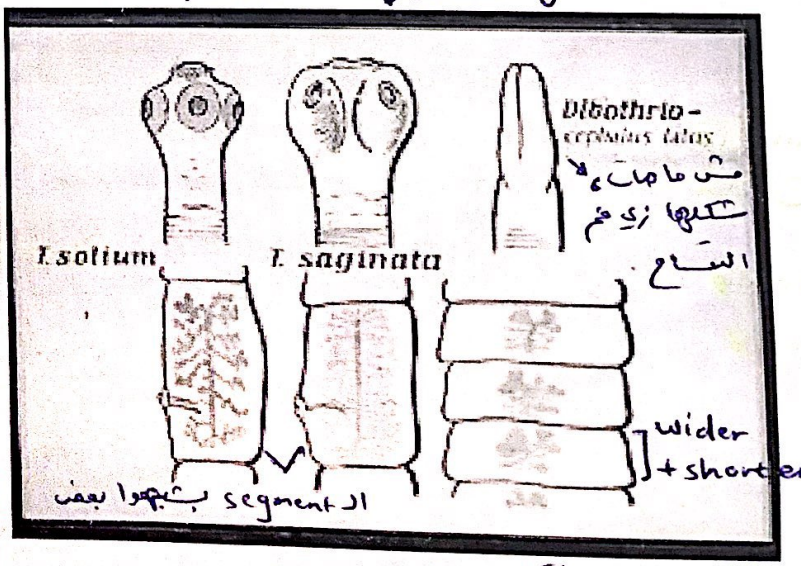






- oval ←
- ② thin cover
- ③ Fertilized egg → immature

operculum



* شكل الطرف بختلف بين ال species.

Life Cycle

* ما تكتفي بـ host واحد بتطور، محتاج لـ another host.

- With the exception of *Hymenolepis nana*, further development of all cestodes requires the passage of the larvae through one or more intermediate hosts.
- Eggs of the genus *Taenia* pass in the stool of their definitive host, reach the soil, and are ingested by the specific intermediate.

* لو جوى أصيب بال Taenia بطلع البيض مع ال stool بعدها بوصل لتربة بعدها ingested by specific intermediate host ال الرئيسي

- Infectious cysts (cysticercus) of *Taenia* form in tissues of the intermediate host. Definitive host ingests cysts in flesh of intermediate hosts to yield adult intestinal worms.

* ال eggs اللي أكلها ال intermediate host بتخرج طلعها من ال intestine وبتروح لل tissue (زي ال muscles) بتطلعها خاصة هناك وبتتحول لـ infectious cysts

- *D. latum*, whose eggs are immature on release, requires two intermediates - a copepod and a freshwater fish - to complete its larval development.

- كل أنواع المخلوقات البحرية اللي ليها صفة طيبة.

Intestinal and Tissue Tapeworms

STAGE	*DIPHYLLOBOTHRIUM LATUM*	*TAENIA SAGINATA*	*TAENIA SOLIUM*	*HYMENOLEPIS NANA*	*ECHINOCOCCUS GRANULOSUS*	*ECHINOCOCCUS MULTILOCULARIS*
Adult						
Definitive host	Humans, cats, dogs	Humans	Humans	Humans, rodents	Dogs, wolves	Foxes
Location (entery)	Gut lumen[a]	Gut lumen[a]	Gut lumen[a]	Gut lumen[a]	Gut lumen	Gut lumen
Length (m)	3–10 (أطولهم)	4–6	2–4	0.02–0.04	0.005	0.005
Attachment device	Grooves	Discs	Discs, hooklets	Discs, hooklets	Discs, hooklets	Discs, hooklets
Mature segment	Broad	Elongated	Elongated	Broad	Elongated	Elongated
Egg						
Maturation status	Nonembryonated	Embryonated	Embryonated	Embryonated	Embryonated	Embryonated
Distinguishing characteristics	Operculate	Radial striations	Radial striations	Polar filaments	Radial striations	Radial striations
Larval development in humans (maturation)	No	No	Yes	Yes	Yes	Yes
Larva						
Intermediate host	Copepods, fishes	Cattle	Swine, humans (less common)	Humans, rodents	Herbivores, humans	Field mice, humans
Location	Tissue	Tissue	Tissue[a]	Gut mucosa[a]	Tissue[a]	Tissue[a]
Form	Procercoid (copepod) Plerocercoid (fish)	Cysticercus	Cysticercus	Cysticercoid	Hydatid cyst (in tissue GIT ش infection)	Hydatid cyst

* اللي تحتهم خط هم اللي رأهم .

Clinical Diseases

- The clinical consequences of tapeworm infection in humans depend on whether the patient serves as the primary or the intermediate host. In the former case, the adult worm is confined to the lumen of the gut, and the consequences of the infection are typically minor. Taeniasis saginata and diphyllobothriasis are prime examples.
- When the patient serves as the intermediate host (eg, for *E. granulosus*), development of larva produces tissue invasion and frequently serious disease.
- The capacity of *H. nana* and *T. solium* to use humans as both primary and intermediate hosts is unique.

Taenia saginata

- *T. saginata* inhabits the human jejunum, where it may live for up to 25 years and grow to a maximum length of 10 m. (segments that have reproductive organs)
- Gravid proglottids containing approximately 100,000 eggs, break free passed in stool.
- These eggs are 30 to 40 mm in diameter, spherical, and possess a thick, radially striated shell.

- If ingested by cattle or certain other herbivores, the embryo is released, penetrates the intestinal wall, and is carried by the vascular system to the striated muscles.
- Here it is transformed into a white, ovoid (5 by 10 mm) cysticercus (*Cysticercus bovis*).
- Humans are infected when they ingest inadequately cooked meat containing these larval forms.

* هو ال Disease اللي بتعمله ال beef worm سواء عن طريق اللحوم
أو الماء والخضار .

BEEFTAPE WORM DISEASE

Clinical Manifestations:

- Most infected patients are asymptomatic and become aware of the infection only through the spontaneous passage of proglottids. The proglottids may be observed on the surface of the stool or appear in the underclothing or bed sheets.

* بلاقيها مقطع بال stool .

- Some patients report epigastric discomfort, nausea, irritability, diarrhea, and weight loss.

بكون سريع وواضح (خلال أسابيع لأشهر)
بسبب انه حجمها كبير .
- عكس ال nematodes بيها سنين .

* عكس يصير passage لل eggs بشكل عام أو لل Proglottids أو عكس يكون بمنطقة ال anal ، زي ما احكينا بحالة قبل ال NIH test عكس نستخدم ال cellophane tape

Diagnosis

- The diagnosis is made by finding eggs or proglottids (مميز) in the stool. Eggs may also be distributed on the perianal area secondary to rupture of proglottids during anal passage.
- The (1) adhesive cellophane tape technique described for pinworm can be used to recover them from this area. With this procedure, 85 to 95% of infections are detected, in contrast to only 50 to 75% by (2) stool examination.
- Because the eggs of *T. solium* and *T. Saginata* are morphologically identical, it is necessary to examine a proglottid to identify the species correctly. ✔

Treatment and Prevention

- The drugs of choice are praziquantel or niclosamide, which act directly on the worm. Both are highly effective in single-dose oral preparations. Ultimately, control is best effected through the sanitary disposal of human feces.
- Meat inspection is helpful; the cysticerci are readily visible. In areas where the infection is common, thorough cooking is the most practical method of control. Internal temperatures of 56°C or more for 5 minutes or longer destroy the cysticerci. Salting or freezing for 1 week at -15°C or less is effective.

Diphyllobothrium latum

- The adult *D. latum* attaches to the ileal mucosa with the aid of two sucking grooves.
- *D. latum* has broad proglottids, operculate eggs are released through the uterine pore daily into the stool. Eggs release coracidia in water. (مشروح تحت)
- If ingested by small freshwater crustaceans of the genera *Cyclops* or *Diaptomus*, they develop into procercoid larvae. When ingested by a freshwater fish, the larvae migrate into its musculature and develop into infectious plerocercoid larvae.
- Humans are infected by eating improperly prepared freshwater fish.

الحيوانات البحرية اللي الها أصناف

* ال eggs طلعت، بصير لها release على الي (عادة المياه العذبة) ← اذا اجت الحيوانات الصغيرة أكلتها (زي السلطعون) بتبدأ تتطور للمرحلة الأولى (Procercoid Larvae) ← coracidia (immature form) بيرجع
يعني Larvae صغيرة ← اذا اجت سمكة كبيرة و أكلت هاد السلطعون بتنتقل للسمكة وبتبدأ تكبر وتنتقل migration
لل muscles تبعت السمك وبتتحول لـ plerocercoid larvae ← اذا اجى الانسان و أكل من هاي الاسماك وما كانت مطبوخة منيح بتنتقل له.

FISH TAPE WORM DISEASE

Epidemiology

- Fish tapeworms are found wherever raw, pickled, or undercooked freshwater fish from fecally contaminated lakes and streams is eaten by humans.
- Even when fish is appropriately cooked, individuals may become infected by sampling the flesh during the process of preparation.

Clinical Manifestations

- Most infected patients are asymptomatic. On occasion, however, they have complained of epigastric pain, abdominal cramping, vomiting, and weight loss.
- Presence of several adult worms within the gut has been known to precipitate intestinal or biliary obstruction.

  * لأنه حجمهم كبير، فعدد قليل منهم كافي انه يعمل obstruction.

- Macrocytic anemia and vitamin B12 deficiency is related to the consumption by the worm.

Scanned with CamScanner

Diagnosis

- The diagnosis is established by finding the typical eggs in the stool usually without the need for concentration techniques.

Treatment and Prevention

- Treatment is carried out as described for *T. saginata* infections. When anemia or neurologic manifestations are present, parenteral administration of vitamin B12 is also indicated.
- Personal protection by thorough cooking of all salmon and Fresh water fish. Fish is rendered noninfectious at 10°C for 48 hours.