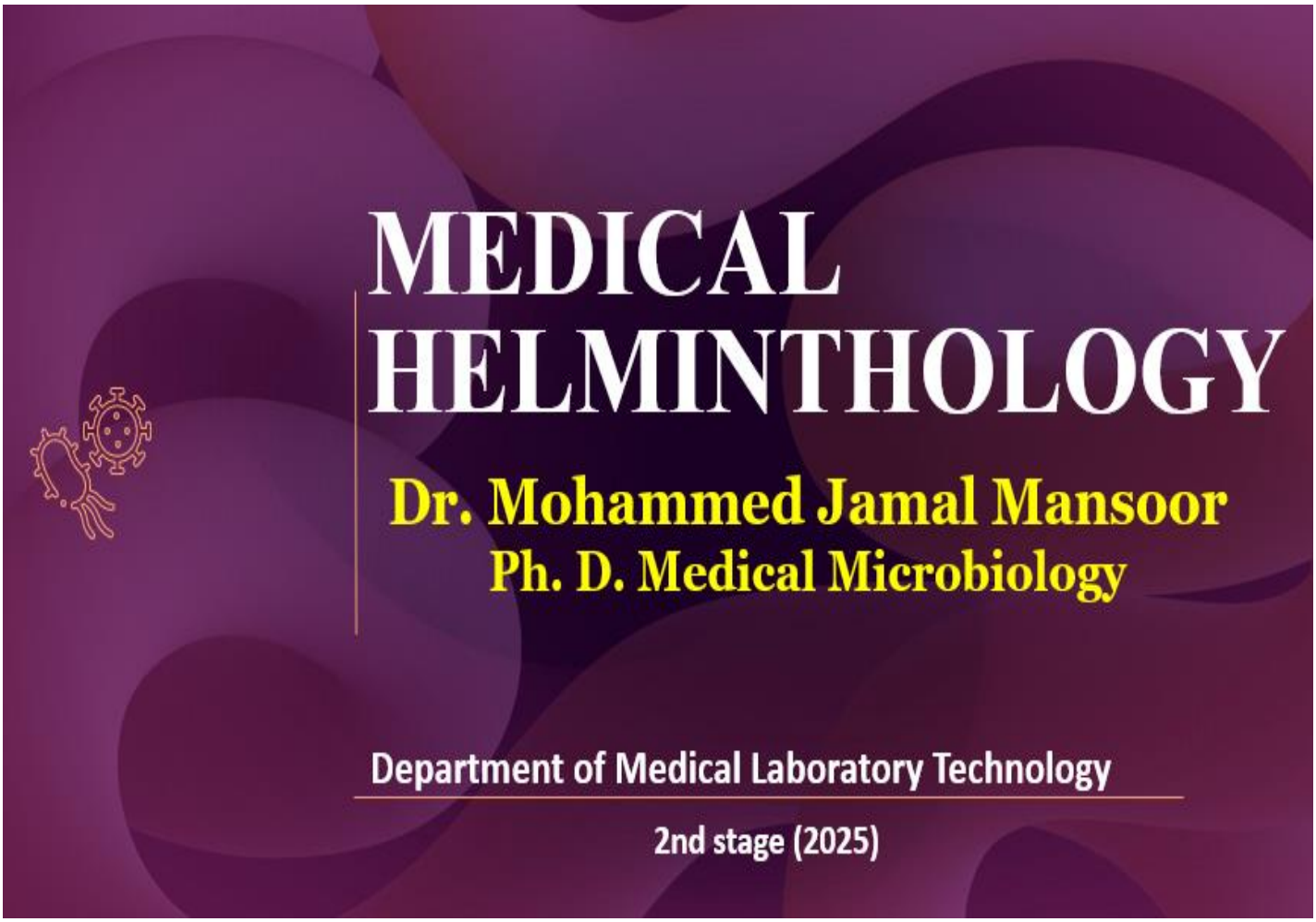

MEDICAL
HELMINTHOLOGY
Dr. Mohammed Jamal Mansoor
Ph. D. Medical Microbiology
Department of Medical Laboratory Technology
2nd stage (2025)

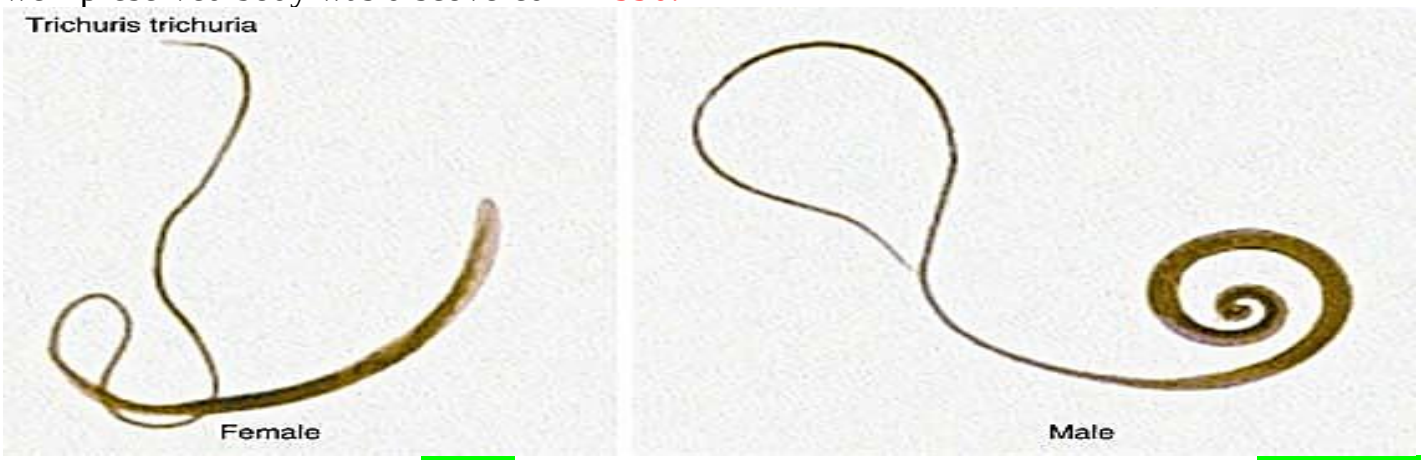
Lec.8 *Trichuris Trichiura*

Common name: Whipworm

The name *Trichuris* means a ***hair-like tail* '(*Greek trichos— hair, oura—tail*).
*The name whipworm is more apt as the thick posterior part resembles the stock and the thin anterior end resemble the lash of a whip.
*** It is worldwide in distribution, but is much more common in the tropics.**
*While whipworm infection is extremely frequent, whipworm disease is relatively rare.

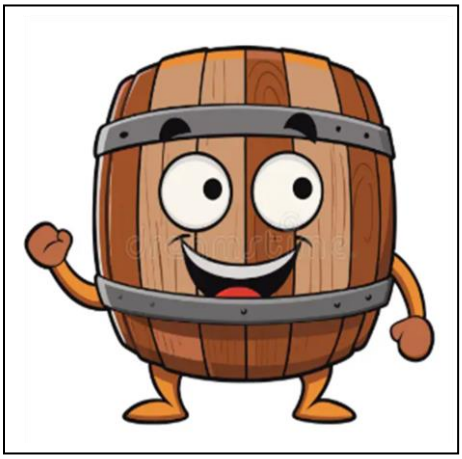
Habitat

* ***T. trichiura*** lives in the **large intestine**. The adult worms are found attached to the wall of the **caecum** and less commonly to the vermiform appendix, colon, and anal canal.
* The male worm is 30–45 mm long, while the female is slightly larger, about 40–50 mm.
* The worm is flesh-colored. In shape, it resembles a **whip**, with the anterior three-fifth thin and thread-like and the posterior two- fifth thick and fleshy, appearing like the handle of a **whip.**
*The attenuated **anterior portion**, which contains the **capillary esophagus**, is embedded in the mucosa. The **posterior part** contains the **intestines** and **reproductive organs**.
- The antiquity of the **whipworm** as a human parasite is indicated by the demonstration of its eggs in colonic contents of a young man, who died on the **Alps** some **5,300** years ago and whose well-preserved body was discovered in **1990**.



*The posterior end of the male is coiled ventrally, while the hind end of the **female is straight, blunt, and rounded.** ***The worm has a lifespan of 5–10 years.**

Egg



The egg has a characteristic appearance.

*It is **brown** in color being **bile-stained.**

*It has a **triple shell**, the outermost layer of which is stained brown.

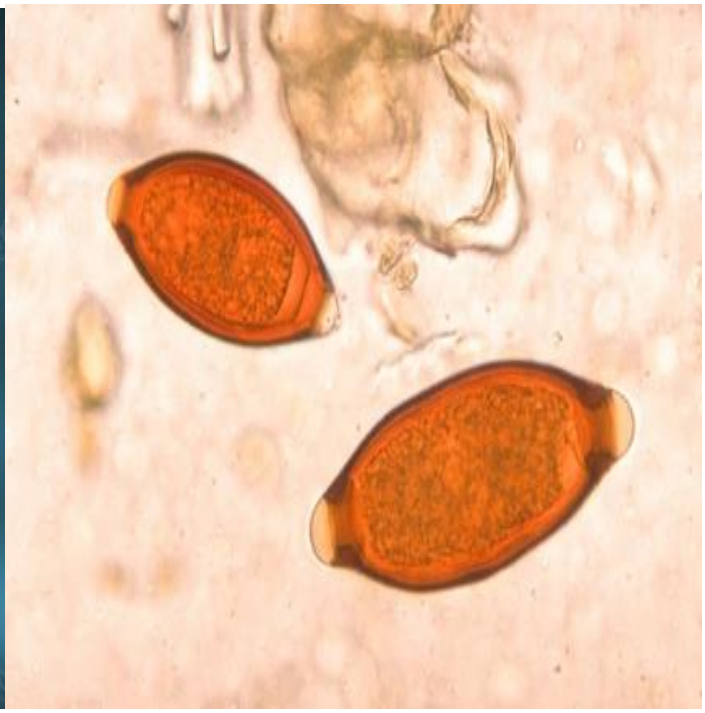
*It is **barrel-shaped** and about **50** µm long and **25** µm **wide in the middle**, with a projecting **mucus plug** at each pole containing an unsegmented ovum

*The **plugs** are **colorless**.

*The egg _ **floats** in saturated salt solution.

*When freshly passed, the egg contains an unsegmented ovum. At this stage, it is not infective for humans.

*The fertilized female lays about **5,000** eggs per day.



Life Cycle

- Life cycle of ***Trichuris Trichiura*** involves **only 1 host.**
- **Natural host: Man. There is no intermediate host**.
- **Infective form: Embryonated eggs containing Rhabditiform larva.**

* Adult female worm **lives in large intestine** worm lays eggs which are discharged in feces.
* The egg undergoes development in **soil**, optimally under **warm, moist, shady** conditions, the **infective rhabditiform larva** develops within the egg in **3–4 weeks**. At lower temperatures, this may be delayed for 3 months or more. **These embryonated eggs are infective to man.**

*** Mode of transmission:**

Infection occurs in humans when the **mature embryonated eggs containing the infective larvae** are **swallowed** in **contaminated food or water**.

* The eggs hatch in the **small intestine** and the larva passes down into the **caecum**.

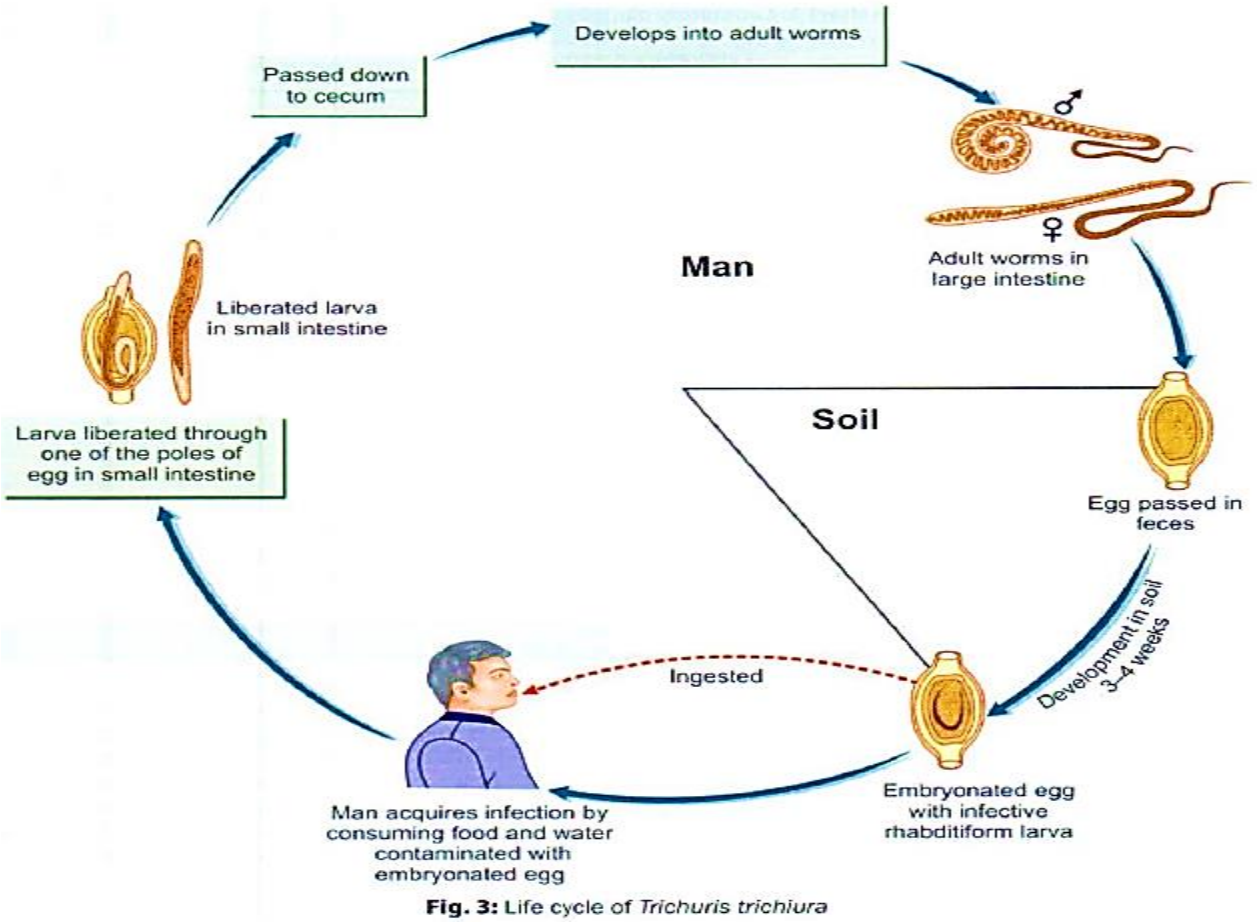
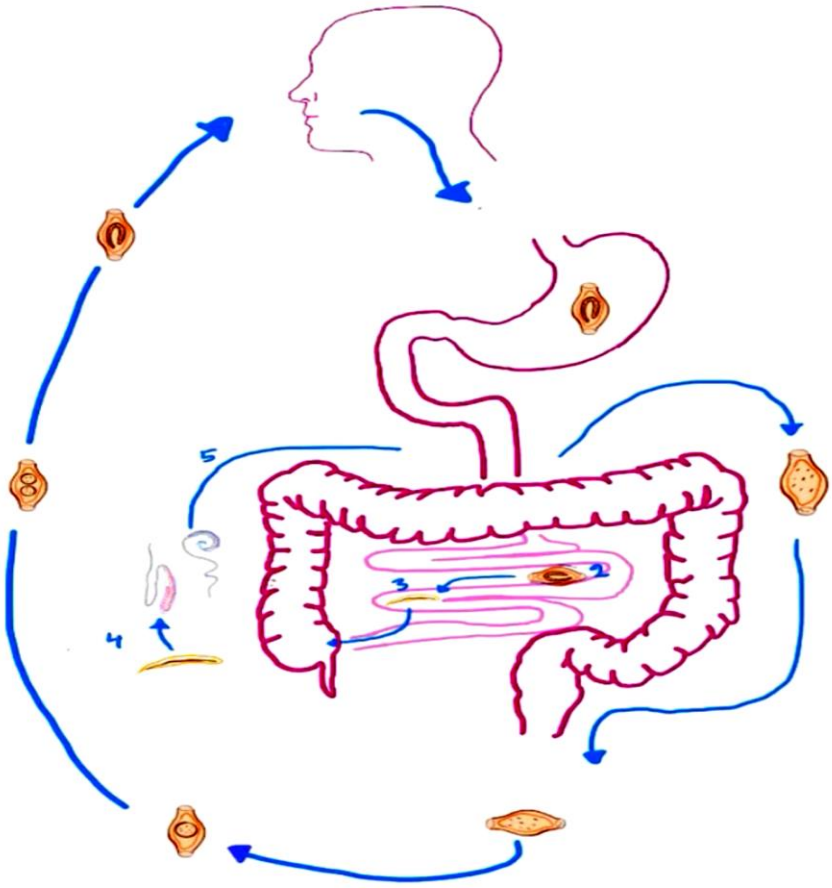


Fig. 3: Life cycle of *Trichuris trichiura*

*In about **2–3 months**, they become **mature adults** and **lie embedded in the cecal wall**, with **thread-like anterior portion piercing the mucosa** and **thick posterior end projecting out**.
***The gravid adult female lays eggs, which are discharged in feces and the cycle is repeated.**
*Eggs start appearing in feces usually about **3 months** after infection.



Pathogenicity and Clinical Features

Infection with *T. trichiura* (**trichuriasis, whipworm infection**, or **trichocephaliasis**) is asymptomatic, except when the worm load is heavy. Disease may result either due to **mechanical effects or allergic reaction.**

The blood loss is **about 0.005 mL per worm per day**. Over a period of time, this may lead to **anemia** and **malnutrition**.

Mechanical blockage of the **appendiceal lumen** by masses of whipworms may cause **acute appendicitis**. In heavy infection, the worm may be **abundant on the colonic mucosa**, even up to the **rectum**. **Mucus diarrhea, chronic dysentery and abdominal pain, and weight loss** are frequently seen in such cases. Some patients, particularly **young children, may develop rectal prolapse.**

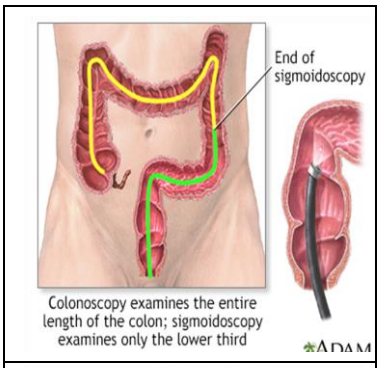
Laboratory Diagnosis

Stool Examination

The characteristic barrel-shaped eggs are found in stools.
*The degree of infection can be assessed by egg counts. **Less than 10 eggs** per smear in direct stool preparation is considered **light infection** and **more than 50** per smear as **heavy infection.**
*Light infection is not considered to cause clinical disease.

Sigmoidoscopy

Sigmoidoscopy is a diagnostic test used to check the sigmoid colon, which is the lower part of your colon or large intestine. This section of your colon is close to your rectum and anus.



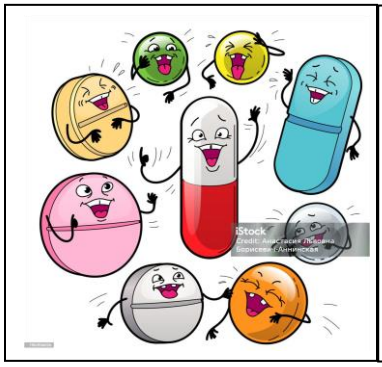
Sigmoidoscopy is useful as worms are found in the rectal mucosa in whipworm diarrhea and dysentery. **Charcot-Leyden crystals** are usually abundant in stools of patients Laboratory diagnosis of *Trichuris trichiura with* whipworm dysentery. In heavy infection, sigmoidoscopy may show white bodies of worm hanging from the inflamed mucosa, the so-called **coconut cake rectum**.

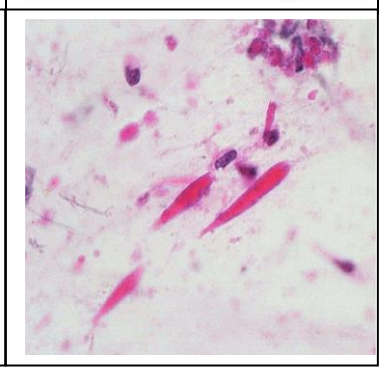
Blood Examination

Differential leukocyte count (DLC) may show up to 25% eosinophilia in the early stage of the disease.

Treatment

Mebendazole Albendazole





Medical Helminthology – 2nd stage (2025)
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Important Questions

Q: All statements on *Trichuris trichiura* are true EXCEPT:

A- Called whip worm
B- Egg are barrel shaped with plug at ends
C- Larvae migrate to lung
D- infective stage embryonated egg
E- adult worm attached to wall of cecum and appendix

Q: *Trichuris trichiura* is:

A- Whip worm its common name
B- Cysticercus bovis is the infective stage
C- cestode
D- Pin worm
E- Beef tape worm

Q: What does the name "Trichuris" mean?

a) Whipworm
b) Hair-like tail
c) large intestine
d) Vermiform appendix

Q: Where was the demonstration of whipworm eggs found in a young man's colonic contents, dating back approximately 5,300 years, discovered

a) Himalayas
b) Alps
c) Andes
d) Rockies

Q: Which regions have a higher prevalence of Trichuris infection according to the provided text?

a) Europe and North America
b) Middle East and Australia
c) Tropical Africa, South America, and South-east Asia
d) Arctic and Antarctic regions

Q: Where is the capillary esophagus located in the Trichuris trichiura worm?
a) Anterior portion
b) Middle portion
c) Posterior portion
d) Entire length

Q: What is the lifespan of the Trichuris trichiura worm?
a) 1-2 years
b) 2-5 years
c) 5-7 years
d) 5-10 years

Q: What is the infective form of *Trichuris trichiura*?
a) Adult worm
b) Embryonated eggs
c) Rhabditiform larva
d) Gravid female worm

Q: Where does the adult female *Trichuris trichiura* lay eggs?
a) Small intestine
b) Large intestine
c) Stomach
d) Rectum

Q: How long does it take for the infective rhabditiform larva to develop within the egg in optimal conditions?
a) 1-2 weeks
b) 2-3 weeks
c) 3-4 weeks
d) 4-5 weeks

Q: Which part of the *Trichuris trichiura* worm resembles the handle of a whip?
a) Anterior third
b) Middle portion
c) Posterior third
d) Entire length

Q: What is the mechanism that may lead to anemia and malnutrition in individuals heavily infected with *Trichuris trichiura*?

a) Blood feeding by the worms
b) Allergic reaction to the worms
c) Oozing of blood at attachment sites
d) Mechanical blockage of the appendiceal lumen

Q: How is the degree of *Trichuris trichiura* infection assessed?

a) By measuring blood loss
b) By stool examination for adult worms
c) By egg counts in stool samples
d) By sigmoidoscopy findings

Q: What is the characteristic feature found in stool samples of patients infected with *Trichuris trichiura*?

a) Charcot-Leyden crystals
b) Coconut cake rectum
c) Eosinophils
d) Barrel-shaped eggs

Q: Which medication is effective in treating *Trichuris trichiura* infection?

a) Amoxicillin
b) Doxycycline
c) Mebendazole
d) Metronidazole