The Aphasmid Nematodes

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Classification of Aphasmid Nematodes

Class Enoplea = Adenophorea = Aphasmidia

Subclass Dorylaimea

Order Trichurida

Family Capillariidae

Capillaria philippinensis

Family Trichinellidae

Trichinella spiralis

Family Trichuriidae

Trichuris trichiura

Capillaria philippinensis

Common Name: **Pudoc worm**

Final Host: **Man/ other vertebrae**

Intermediate host: **glass fish**

Habitat: **Small Intestine**

Diagnostic Stage: **Ova in stool**

Infective Stage: **Larva in IH**

Sources of Infection: **Food borne**

Mode of transmission: **Ingestion**

Portal of Entry: **Mouth**

Capillaria philippinensis

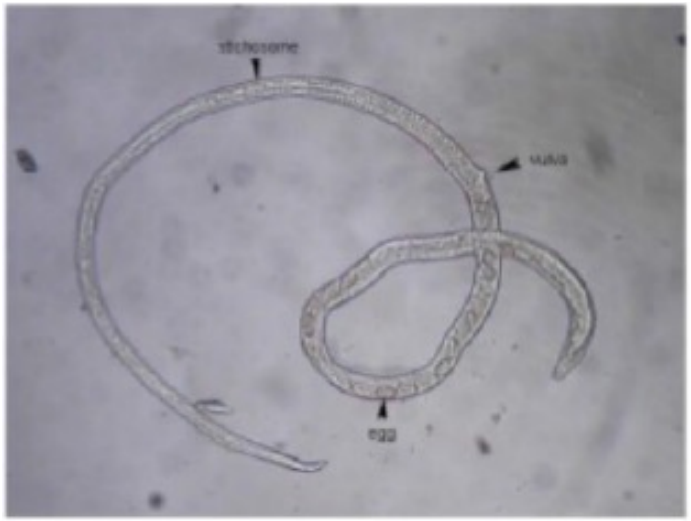
Female: 2.5-4.4 mm

Typical female – with eggs in uterus 8-10 in single file

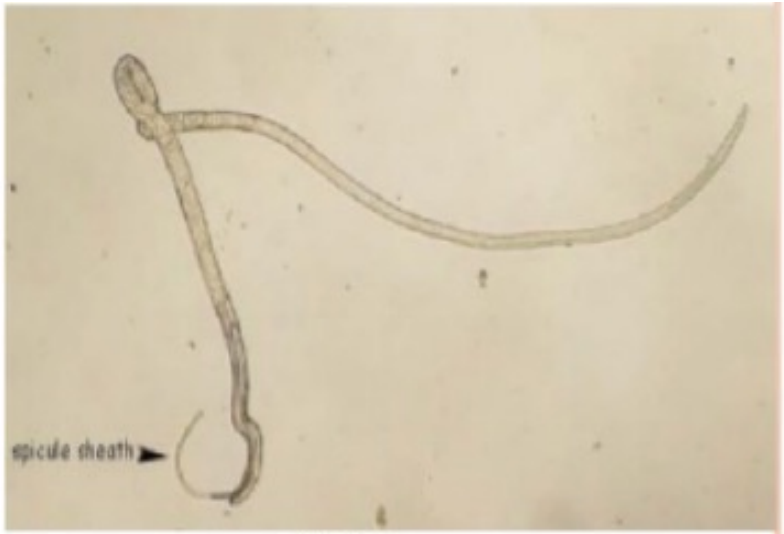
Atypical female – larviparous, 40-45 eggs arranged in 2-3 rows in the uterus

Male: 2.2-3.2 mm

with chitinized spicule

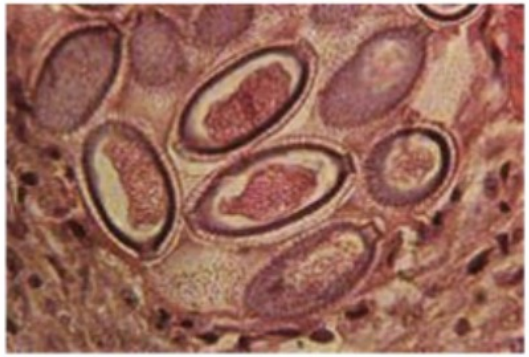


Female



Male

Capillaria philippinensis



Morphology:

Ova: Produced by typical female

-moderately thick striated egg sheath

-with flattened bipolar plugs

- 1-2 segmentation

*Diagnostic stage

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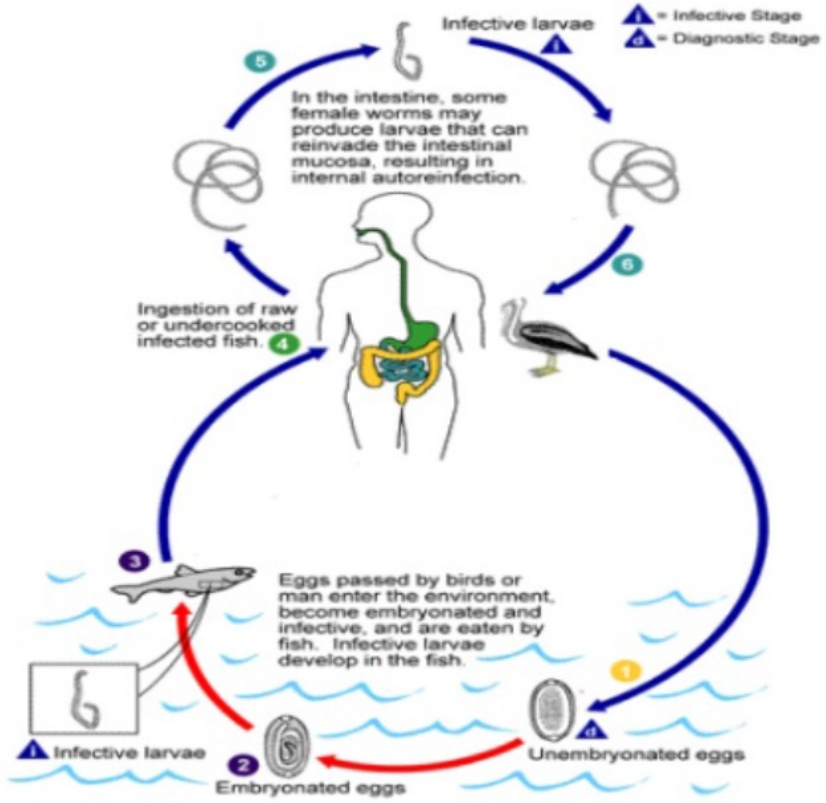
Capillaria philippinensis	
Common Name	NA
Infective Stage	Encysted Larvae
Habitat	Small Intestine
Mode of Transmission	Ingestion of raw/ undercooked contaminated fish
Diagnostic Specimen	Feces

Capillaria philippinensis

Capillaria philippinensis



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Capillaria philippinensis

Pathology:

-Can cause microulceration, depression of intestinal villi
-Borborygmi
-Abdominal pain
-Diarrhea
-Weight loss
-Malabsorption
-Low plasma electrolyte concentration

Laboratory test:

- DFS
- Concentration techniques (FECT)
- examination of duodenal aspirate

Rx of choice:

Albendazole, Mebendazole

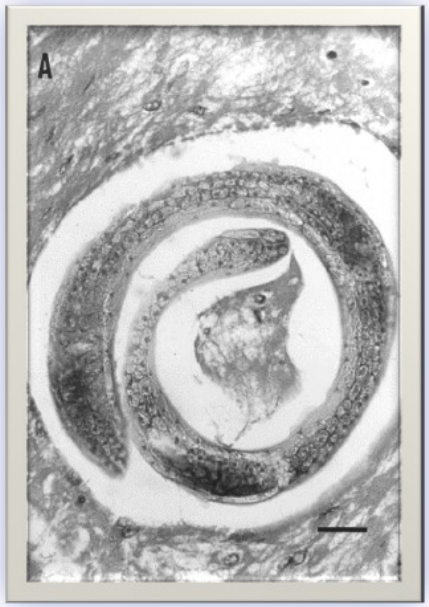
Genus *Trichinella*

- All are parasitic
- 11 known species comprise the genus
- 2 main clades
  1. Encapsulated
     - species in which the host muscle cells they invade become surrounded by a collagen capsule
  2. Non-encapsulated
     - no encapsulation occurs in the host muscle

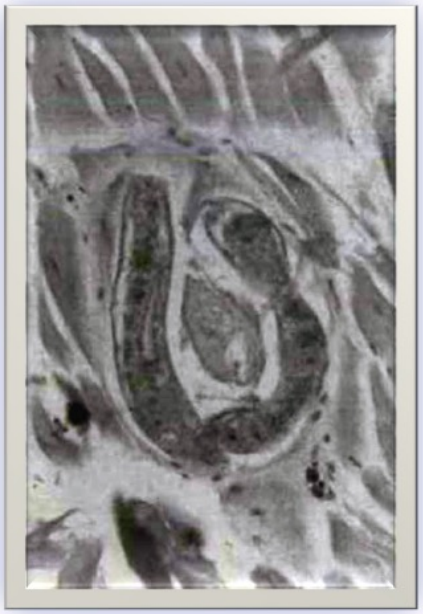
Genus *Trichinella*

- **The five species (and three genotypes yet to be defined taxonomically) that comprise the encapsulated clade parasitize only mammals**
- **Three species comprise the non-capsulated clade**
- **One infects mammals and birds**
- **Other two species infects mammals and reptiles**
- **There are only two of these parasites, *T. papuae* and *T. zimbabwensis*, known to complete their entire life cycle independently of whether the host is warm-blooded or cold-blooded**

Genus Trichinella



Trichinella papuae



Trichinella zimbabwensis

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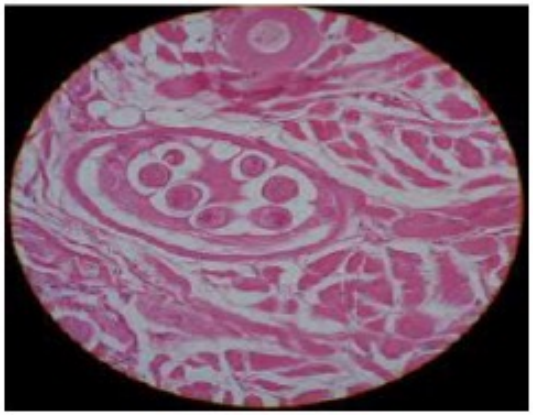
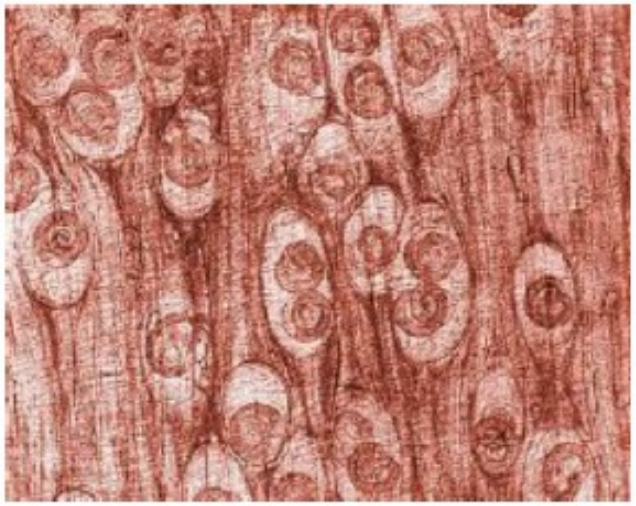
Trichinella spiralis

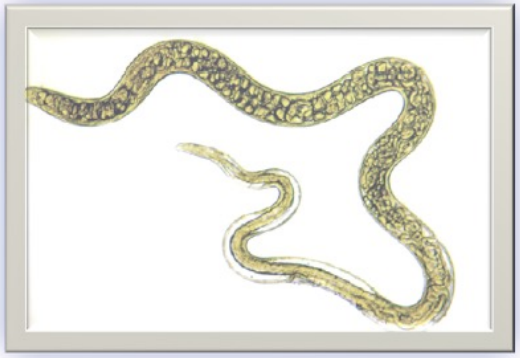




Common Name: Trichina worm	
Infective Stage	Encysted Larvae
Habitat	Striated muscle tissue
Mode of Transmission	Ingestion of raw/ undercooked contaminated meat
Diagnostic Specimen	skeletal muscle biopsy/ Blood (LDH, Aldolase, CPK, eo ct)

Trichinella spiralis

- **Greek: *trichinos* = of hair, *-ella* = diminutive**
- **Latin: *Trichinella spiralis* means spira, which is a reference to how this organism coils up in its host**
- **Well known for its parasitic lifestyle**
- **Belongs to the first clade**
- **Main hosts are meat eating animals**
- **Resides within skeletal muscles**
- **Disease caused is "trichinosis"**



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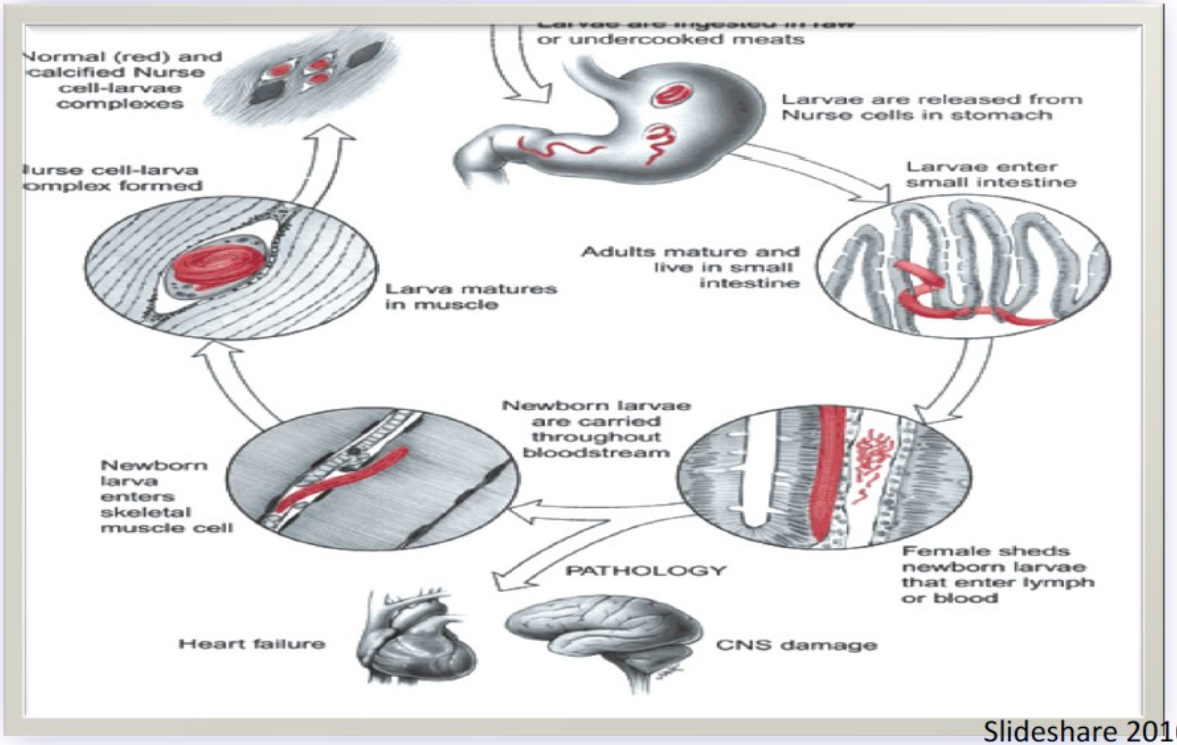
T. spiralis organs

- Buccal cavity – helps anchor the worm; for feeding
- Hydrostatic skeleton – for movement
- Tail – helps in locomotion; where caudal glands are located that secrete adhesives to anchor the helminth to its substrate
- Amphids – specialized sensory structures located on the lateral sides of the head
- Simple nervous system - dorsal and ventral nerve cords; interpret stimuli coming from the amphids; allows parasite to react to environment
- Cuticle - covers the worm; is shed off to allow growth of the worm

T. spiralis **– life cycle**



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T. spiralis **- reproduction**

- Encysted nematode is ingested
- Travel to the stomach to be digested
- digestive functions of the stomach allow the nematodes to change from their encysted to their active forms
- Molts four times for the first 34 hours
- Female releases pheromones to attract the male
- Male coils itself around the females genitals
- Male then inserts its spicule/s into female's genitals where the amoeboid sperms will crawl
- When eggs are fertilized, the mother will not release the eggs unless they have hatched within its uterus
  - Usually the 5^{th} or 6^{th} day of infection

T. spiralis **- reproduction**

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Trichuris trichiura

Common Name: **Whipworm**

Final Host: **Man**

Habitat: **Large Intestine - attached**

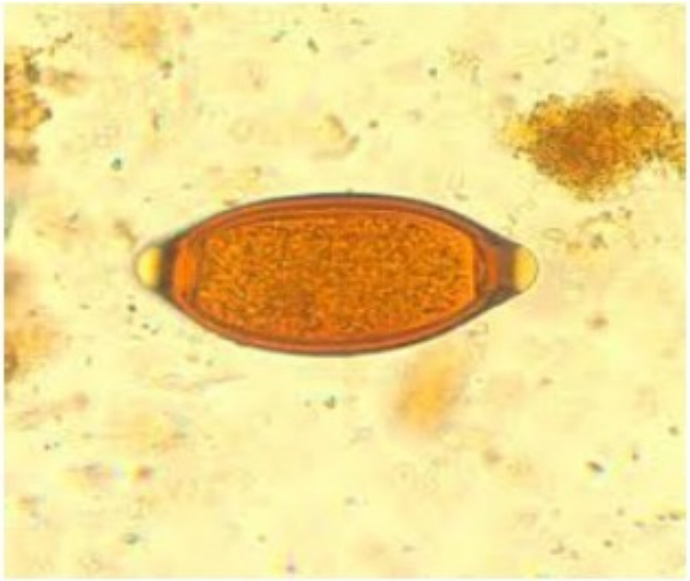
Diagnostic Stage: **Ova**

Infective Stage: **Embryonated Ova**

Sources of Infection: **Soil Transmitted Helminthes**

Mode of transmission: **Ingestion**

Portal of Entry: **Mouth**

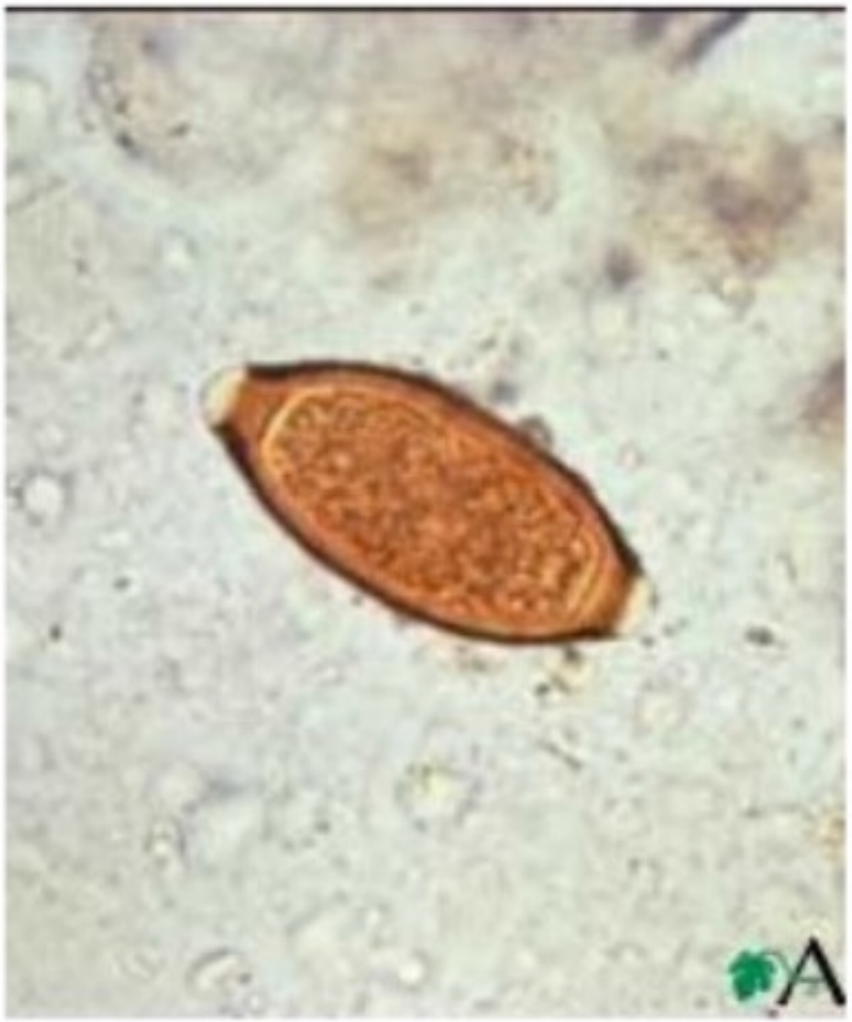


Trichuris trichiura

Common Name	Whipworm
Infective Stage	Embryonated Egg
Habitat	Large Intestine
Mode of Transmission	Ingestion of egg via contaminated food/ water
Diagnostic Specimen	Feces

FEMALE

MALE



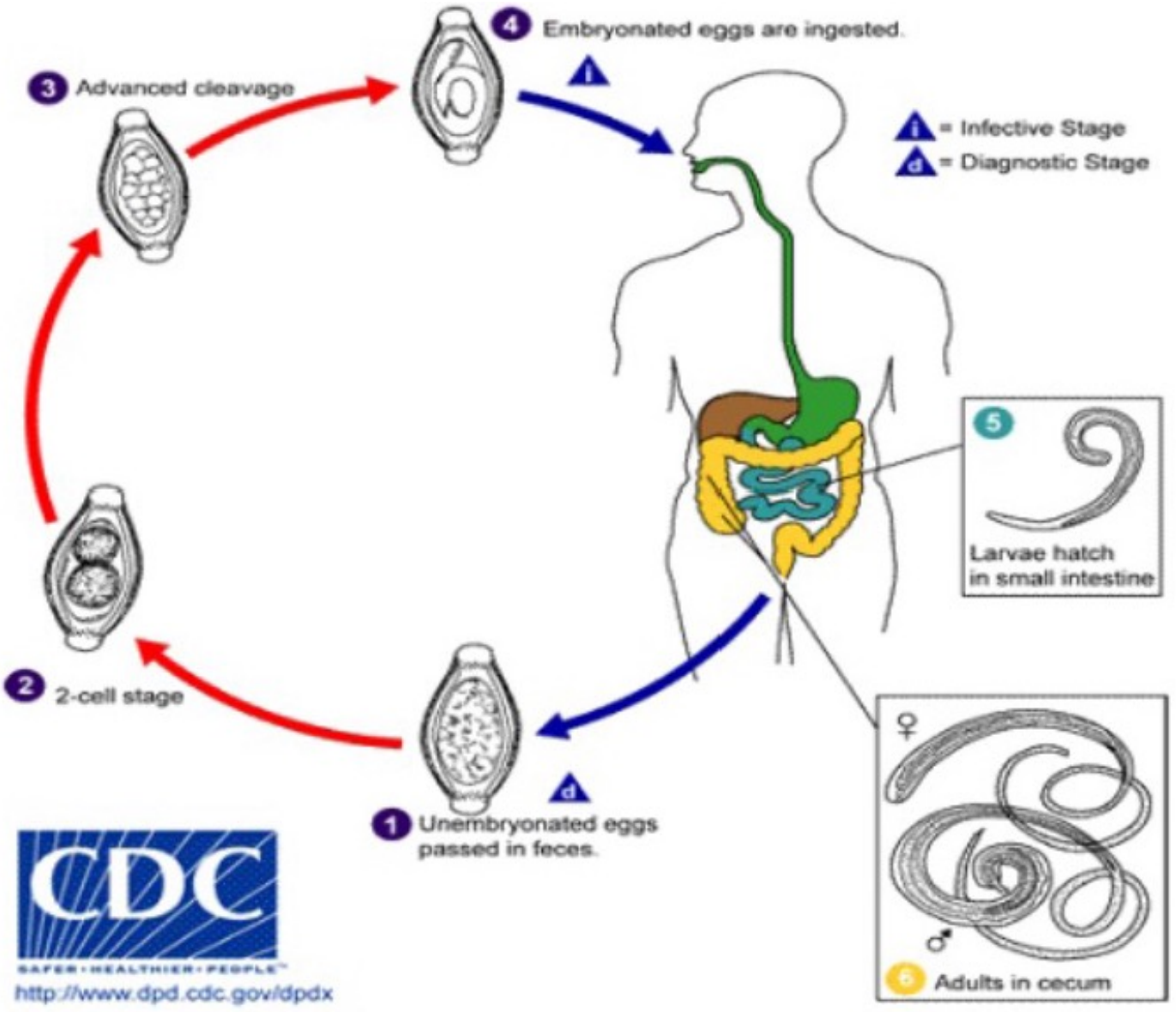
-With mucoid, bipolar plug

-Foot ball - shaped

-Lemon-shaped

-Barrel-shaped

* Diagnostic stage


4 Embryonated eggs are ingested.
i
3 Advanced cleavage
i = Infective Stage
d = Diagnostic Stage
5
Larvae hatch
in small intestine
2 2-cell stage
d
1 Unembryonated eggs
passed in feces.
♀
♂
6 Adults in cecum
CDC
SAFER · HEALTHIER · PEOPLE™
http://www.dpd.cdc.gov/dpdx

Trichuris trichiura

- Diagnosis – Kato-Katz like for *Ascaris*
- Pathology: diarrhea, iron deficiency anemia, rectal prolapse
- To declare Trichuris-free: three Kato-Katz negative
- Possible reasons for negative Kato-Katz results:
  - Free from *Trichiuris*
  - All male infection
  - Female worms still immature
  - Both males and females still immature

Thank you.