

Ascaris lumbricoides
Toxocara spp.

SECERNENTEA (PHASMIDIA)

CHARACTERISTICS NOTES :

- having caudal chemoreceptor organs or Phasmids
- caudal papillae (numerous)
- excretory system (lateral canals present)
- eggs without bipolar plugs

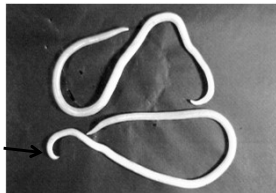
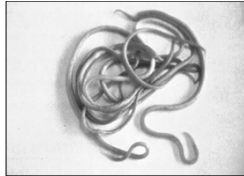


Ascaris lumbricoides
(The large intestinal roundworm)

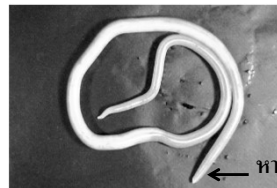
DISTRIBUTION :

- cosmopolitan
- common in warm, moist climate regions

พยาธิไส้เดือน : *Ascaris lumbricoides*



Male



Female

Ascaris lumbricoides

adult
15-30 cm

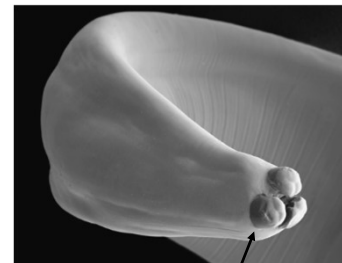


GENERAL CHARACTERISTICS:

- cylindrical, tapering at anterior end
- having 3 lips
- male worm is curved ventrad having two equal spicules

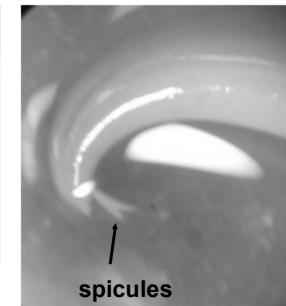
Ascaris lumbricoides

anterior end



3 lips

tail end of male



spicules

Egg

4 layer : lipid — chitinous — vitelline — albuminous

1. Fertilized egg

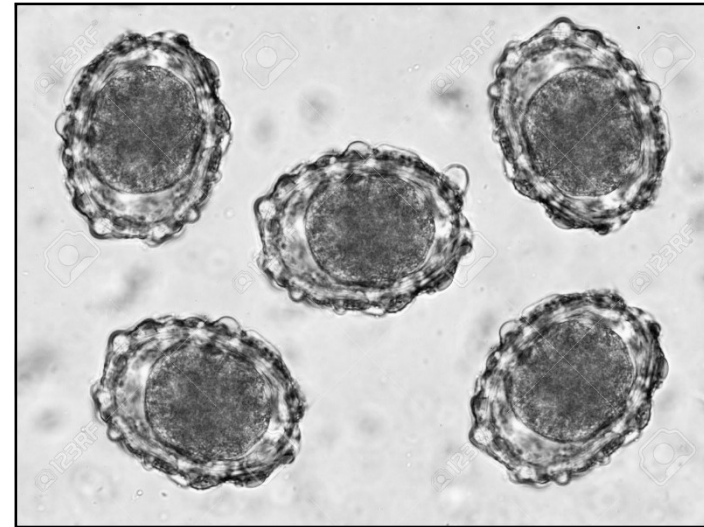
- broadly avoid, 75 X 50 um

2. Unfertilized egg

- elongate 90 x 40 um with thin middle

3. Decorticated egg

- both eggs without albuminous layer



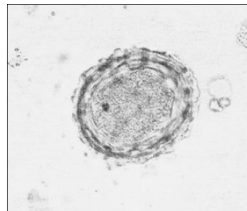
Fertilized egg

- 75 x 50 um, brownish to the bile pigment

- Outermost egg shell layer is a albuminous coat

- Thick egg shell especially chitinous layer

- Usually find a one-cell stage in freshly passed faeces

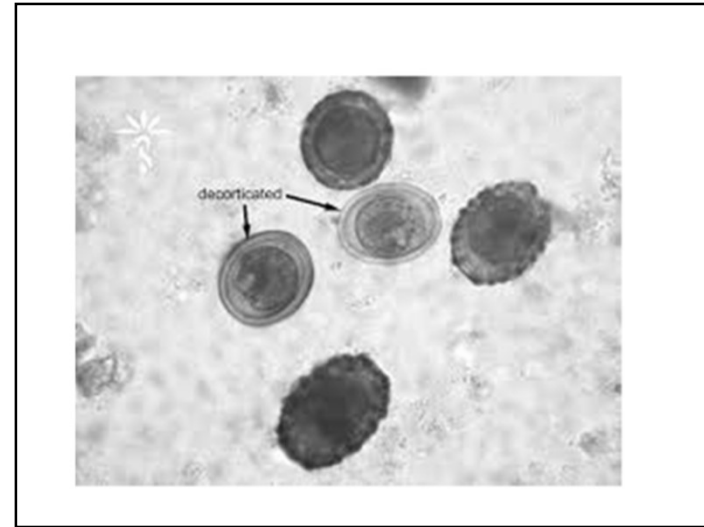
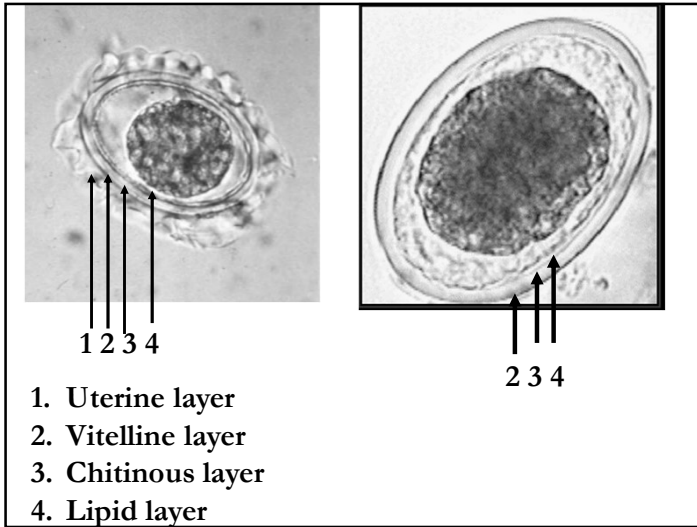


Fertilized egg, decorticated egg

- Broadly avoid with a thick shell transparent


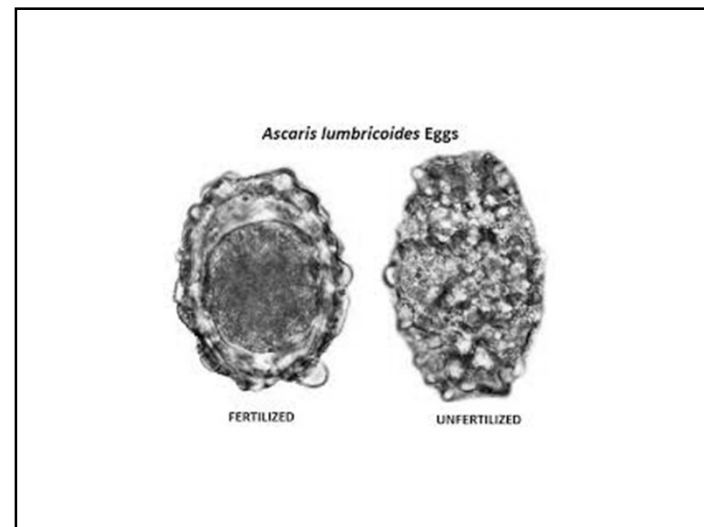
- No outer albuminous layer

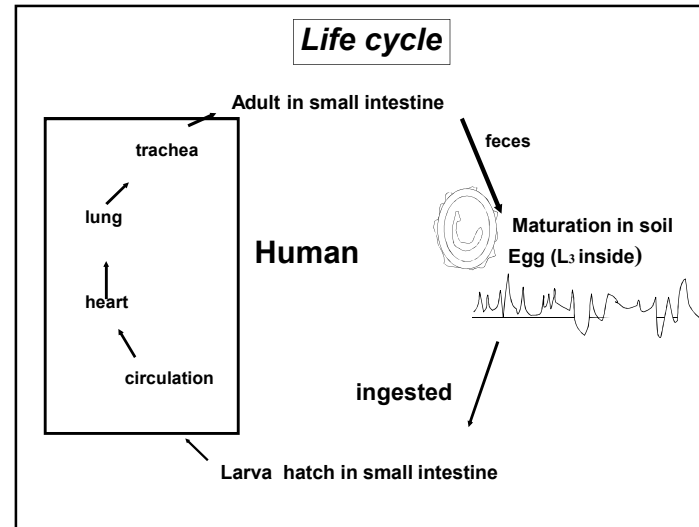
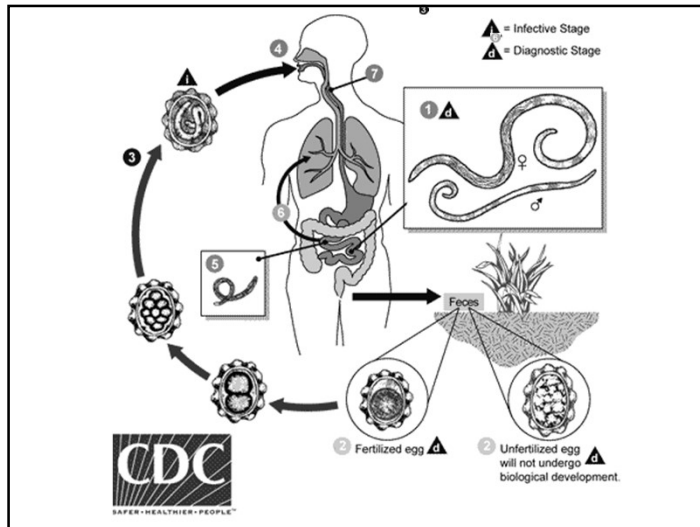




Unfertilized egg

- 90x60 um, brownish
- Elongated ovoidal in shape
- Egg shell is thinner than the fertilized of *Ascaris* egg
- It contains a mass of disorganized, highly refractive granules of various size



Life Cycle:

Adult worms live in the lumen of the small intestine.

A female may produce approximately 200,000 eggs per day, which are passed with the feces.

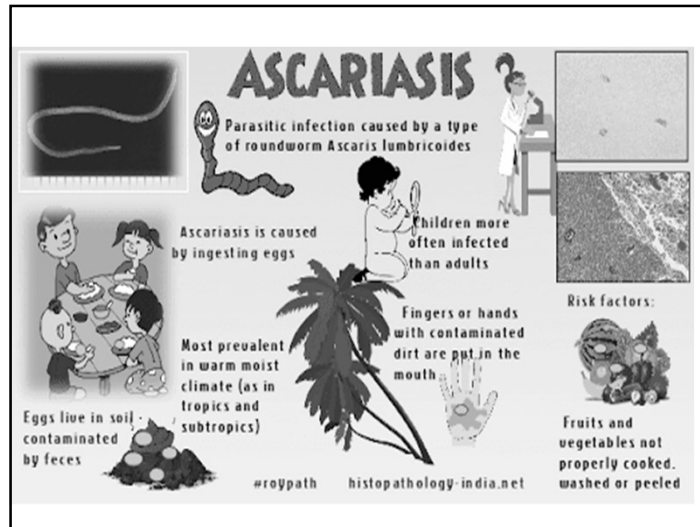
Unfertilized eggs may be ingested but are not infective.

Fertile eggs embryonate and become infective after 18 days to several weeks, depending on the environmental conditions (optimum: moist, warm, shaded soil).

After infective eggs are swallowed, the larvae hatch, invade the intestinal mucosa, and are carried via the portal, then systemic circulation to the lungs.

The larvae mature further in the lungs (10 to 14 days), penetrate the alveolar walls, ascend the bronchial tree to the throat, and are swallowed. Upon reaching the small intestine, they develop into adult worms.

Between 2 and 3 months are required from ingestion of the infective eggs to oviposition by the adult female. Adult worms can live 1 to 2 years.



Pathology:

due to immune response of host & mechanical effect of worms

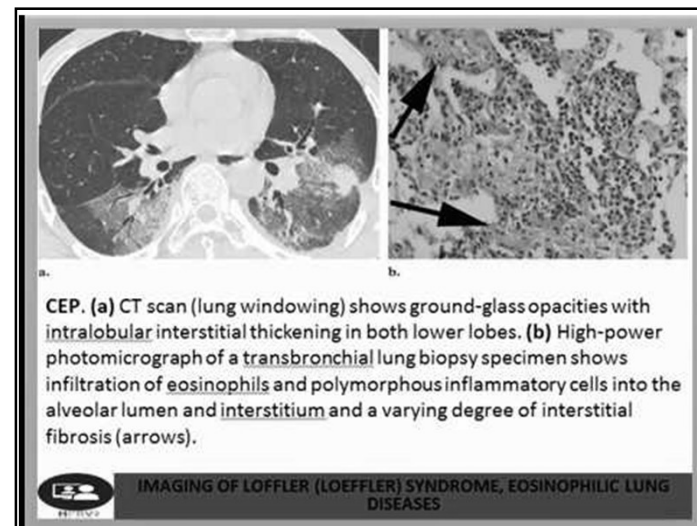
Larvae in lung:

- > bronchial damage
- > pneumonia (Loeffler's syndrome)

Loeffler's syndrome

Simple pulmonary eosinophilia is inflammation of the lungs associated with an increase in Eosinophils.

Causes: Most cases of simple pulmonary eosinophilia are due to an allergic reaction, either from a drug, such as sulfonamide, or infection from a fungus or parasite, including *Ascaris lumbricoides*



CEP. (a) CT scan (lung windowing) shows ground-glass opacities with intralobular interstitial thickening in both lower lobes. (b) High-power photomicrograph of a transbronchial lung biopsy specimen shows infiltration of eosinophils and polymorphous inflammatory cells into the alveolar lumen and interstitium and a varying degree of interstitial fibrosis (arrows).

IMAGING OF LOEFFLER (LOEFFLER) SYNDROME, EOSINOPHILIC LUNG DISEASES

Pathology:

Adult:

- Malnutrition
- Migration of adult worms
- Adults impacted in many organs

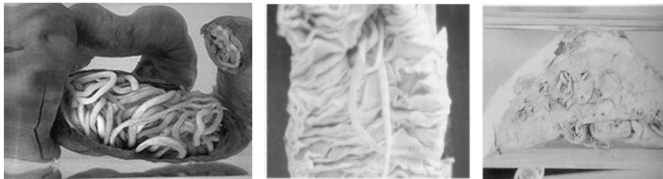
Migration of adult worms



Pathology

Intestine

Liver



Adult worms of *Ascaris lumbricoides* obstruct in the small intestine and liver



Pathology



A great number of *Ascaris lumbricoides* parasitic in an 8 year-old boy.

Epidemiology

Eggs become infectious after 2 weeks in soil; they can persist in soil for 10 years or more.

2 factors:

- soil: - humidity
- temperature
- habit of host



Diagnosis

- feces (egg)
- adult worm
- clinical
- X-ray

Mebendazole

- 100 mg twice daily for 3 days
- 600 mg single dose

Albendazole

- 400 mg single dose

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พยาธิไส้เดือนของ
สุนัข&แมว



Toxocara spp.

* species that are known to cause disease in man are

Toxocara canis
Toxocara cati

Toxocara canis

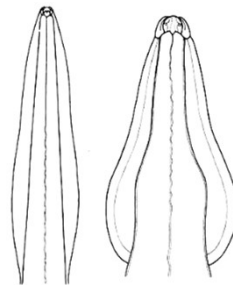


© Waziri Photography

Toxocara spp.

Adult

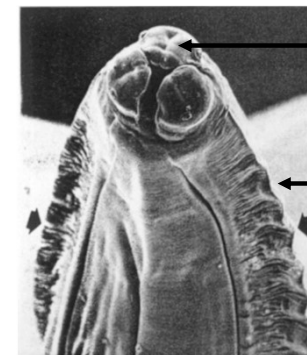
- smaller than human *Ascaris*
- 4-6 x 7-12 cm
- cervical alae



T. canis

T. cati

Toxocara spp.



3 lips

Cervical alae

Toxocara canis
(The dog ascarid)

Distribution: cosmopolitan

Typical characteristics: cervical alae are much longer than broad

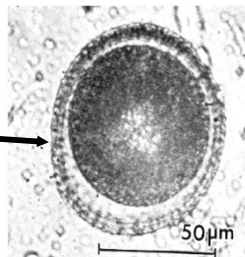
Disease is found worldwide or in virtually every country

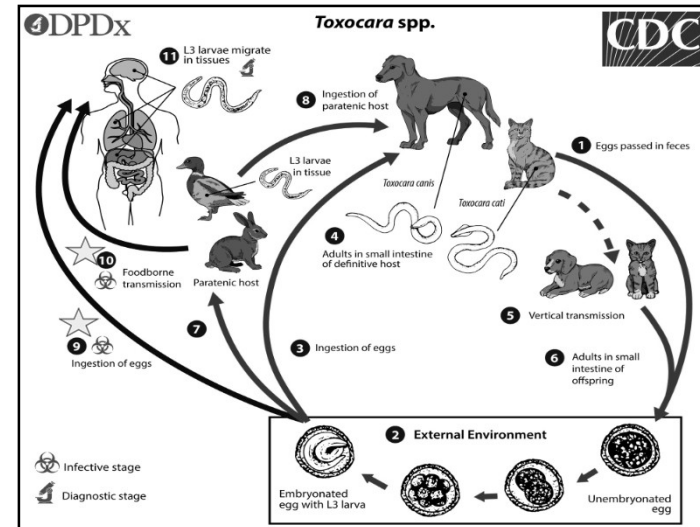
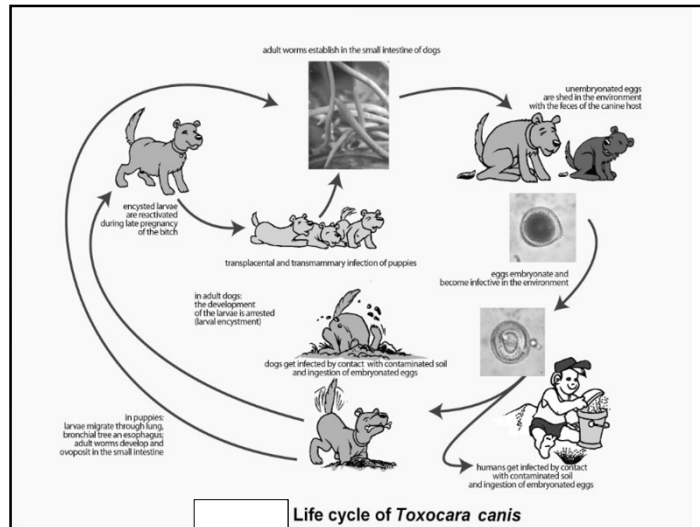


EGG

- subglobose
 - pitted shell
 - unembryonated
 - infective stage in 3-4 weeks
- *(3rd stage larvae in eggs)

pitted surface of egg shell





Human infection with

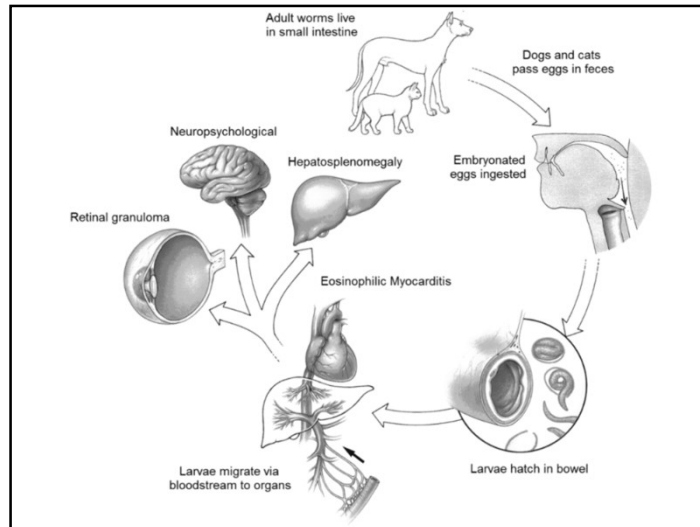
- ingestion of infective eggs from soil
- possible larvae in uncooked tissue of a paratenic host

Caused:

Visceral larva migrans
Ocular larva migrans

Visceral Larva Migrans (VLM)

VLM: is a syndrome caused by the migration of the larva of *Toxocara* spp. or other parasitic helminths in deeper parts of body

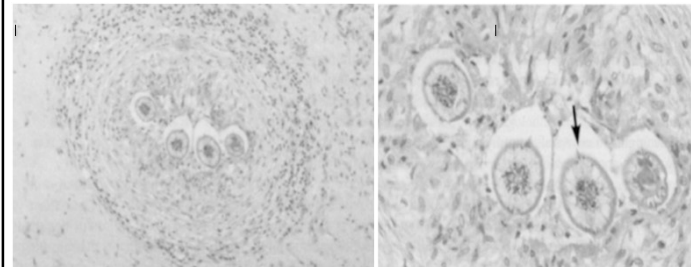


VLM

- Symptoms depend on the organ(s) affected.
- Patients can present with pallor, fatigue, weight loss, anorexia, fever, headache, skin rash, cough, asthma, chest tightness, increased irritability, abdominal pain, nausea, and vomiting.
- Sometimes the subcutaneous migration tracks of the larvae can be seen.

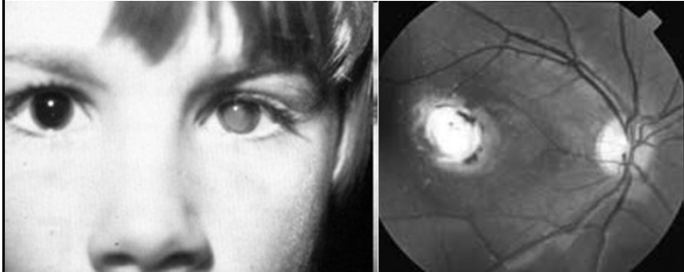
- Patients are commonly diagnosed with pneumonia, bronchospasms, chronic pulmonary inflammation, hyper eosinophilia, hepatomegaly, hypergammaglobulinaemia (IgM, IgG, and IgE classes)
- Severe cases -> hypersensitive to allergens; in rare cases, epilepsy, inflammation of the heart, pleural effusion, respiratory failure, and death have resulted from VLM.

Pathology



A lung section from patient with VLM

Ocular larva migrans (OLM)



Ocular larva migrans (OLM)

- *Toxocara* damage in the eye -> blindness.
- often occurs in just one eye and from a single larva migrating into and encysting within the orbit.
- Loss of vision occurs over days or weeks.
- Other signs and symptoms: red eye, white pupil, fixed pupil, retinal fibrosis, retinal detachment, inflammation of the eye tissues and retinal granulomas
- Ocular granulomas resulting from OLM are frequently misdiagnosed as retinoblastomas.

Epidemiology

- Eggs can mature to the infective stage after two weeks outside of a host.
- Fresh eggs cannot cause toxocariasis.
- *Toxocara* eggs can remain infectious for years, as they are very resistant to the effects of chemicals, as well as changes in temperature.
- Defecation habits of dogs cause *T. canis* transmission to be more common than that of *T. cati*.
- Flies can act as mechanical vectors for *Toxocara*

D
i → **Biopsy or surgical operation**
a → **if larvae excised in tissue**
g
n → **Serological: ELISA**
o → **PCR (research)**
s → **The degree of contact with dog**
i
s

Prevention and control

- **Washing hand well after playing with dogs or cats**
- **Eat cooked meat**
- **Dogs or cats should be treated with drug**

