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Trichinella Spiralis

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INTRODUCTION

- ▶ Classification of *Trichinella Spiralis*
- ▶ Geographical distribution
- ▶ Morphology
- ▶ Life cycle
- ▶ Pathogenicity
- ▶ Symptoms
- ▶ Diagnosis
- ▶ Control

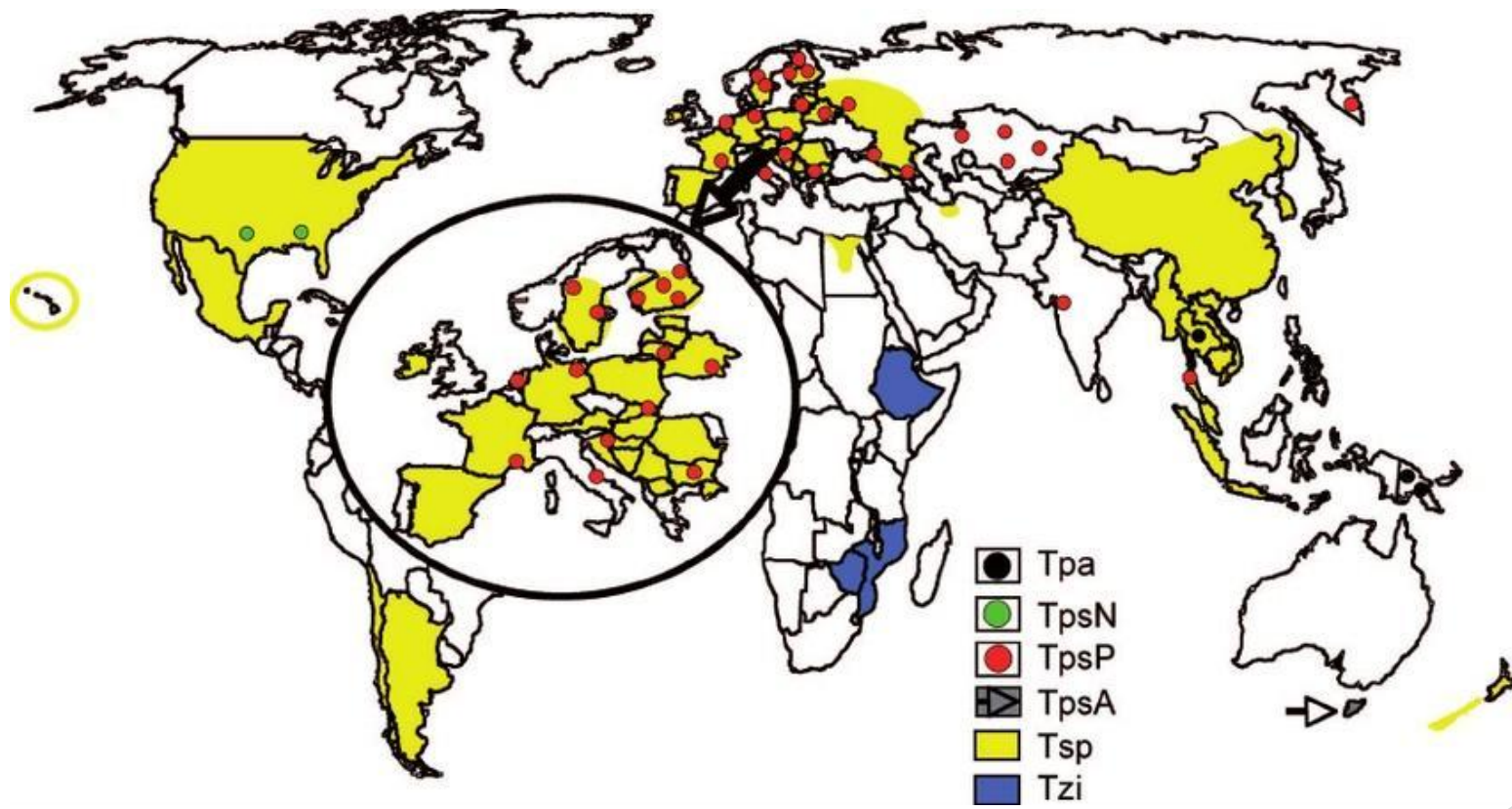
Classification of *Trichinella spiralis*

Scientific classification

- ▶ Kingdom: Animalia
- ▶ Phylum: Nematoda
- ▶ Class: Adenophorea
- ▶ Order: Trichurida
- ▶ Family: Trichinellidae
- ▶ Genus: *Trichinella*
- ▶ Species: *spiralis*
- ▶ **Name: *Trichinella spiralis***

Geographical distribution

- ▶ **Geographical distribution**
- ▶ **Trichinella** is found on every continent except Antarctica. Most of the eight species have wide **geographic** and host **distribution**, a few of them are found only in specific areas and animals. Humans are susceptible to every species. The disease is less common in countries where pork is not eaten.



Morphology of *Trichinella spiralis*

Morphology

- ▶ *T. spiralis* is a white roundworm with an unsegmented body and is visible to the naked eye and inhabits small intestines. The adult male has a body size of 1.5 mm by 0.04 mm, and adult females are 3 mm by 0.06 mm with muscle larvae measuring about 1 mm.



Morphology:

Adult female worm:

The anterior two-thirds of the body being very thin (looks like a whip) and the remaining posterior end is thick and linear.

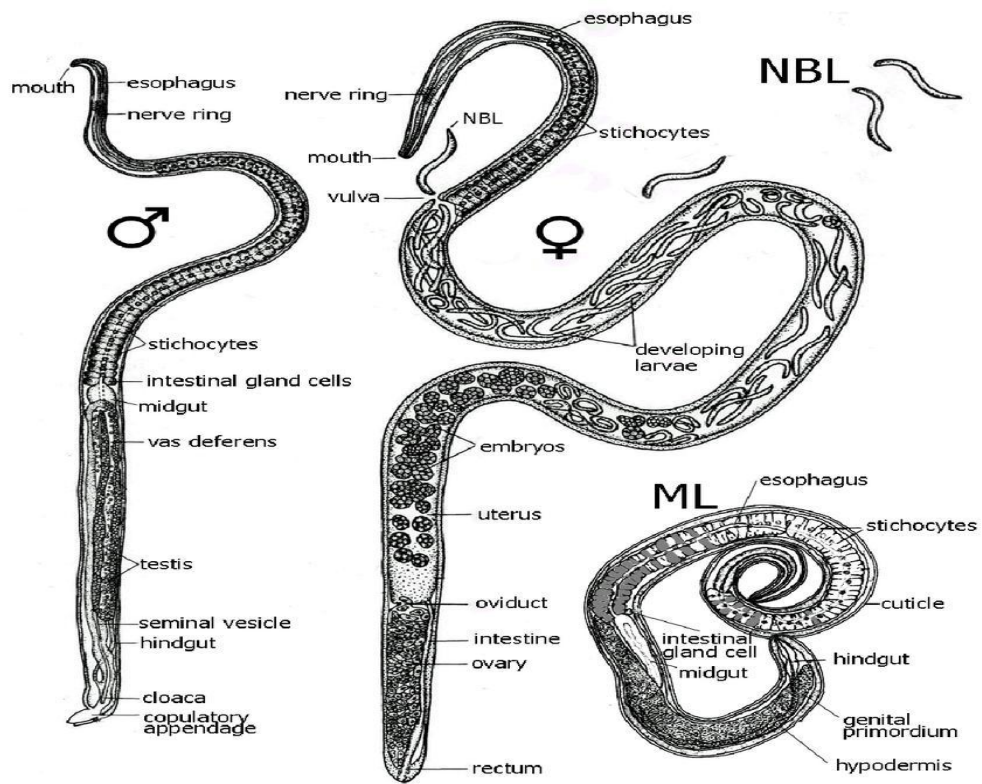
Size: 3.5-5cm in length

Adult Male worm:

smaller than the female, 3.0-3.5cm.

The posterior end is curved and has a single spicule enveloped with sheath.

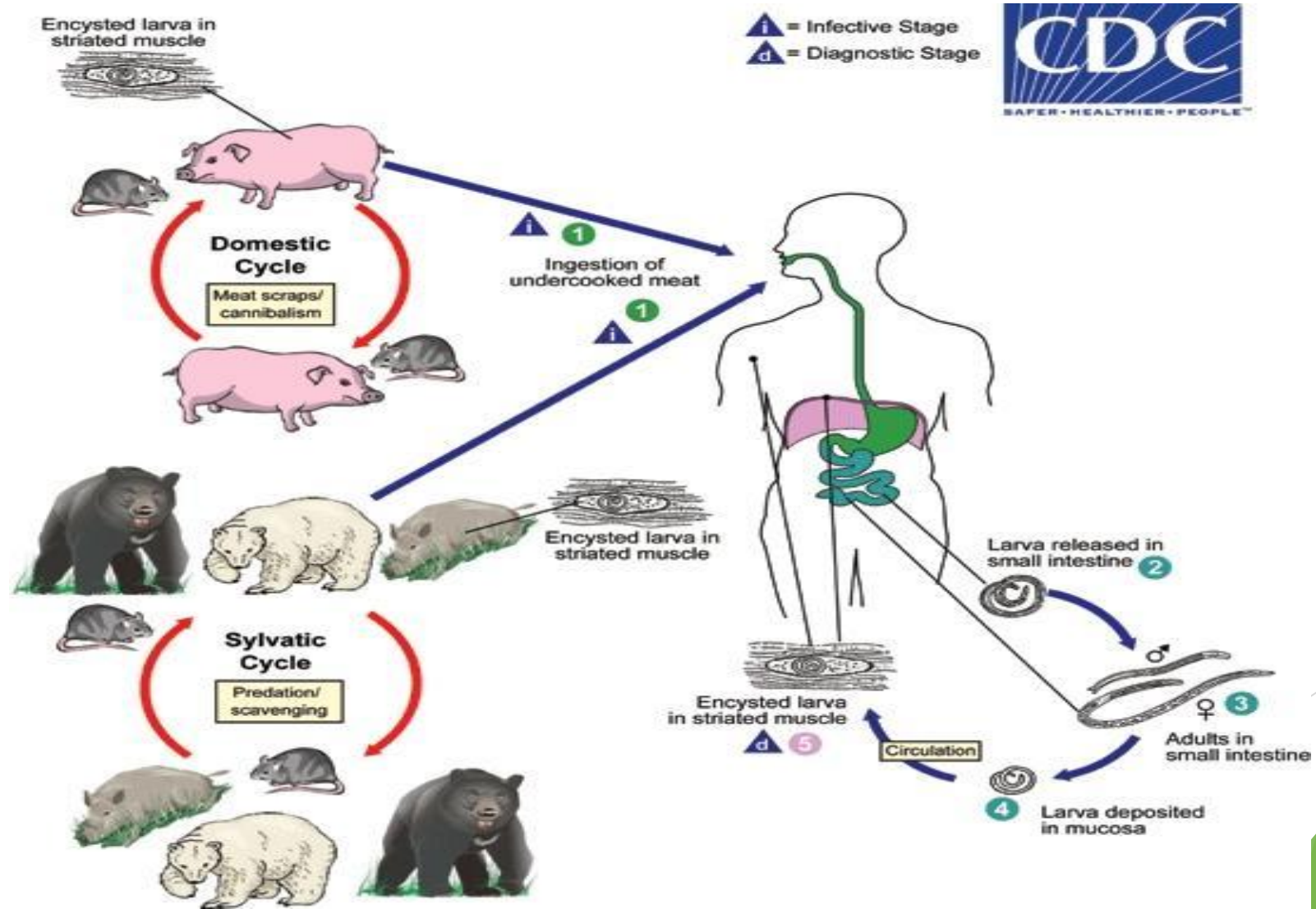
Morphology



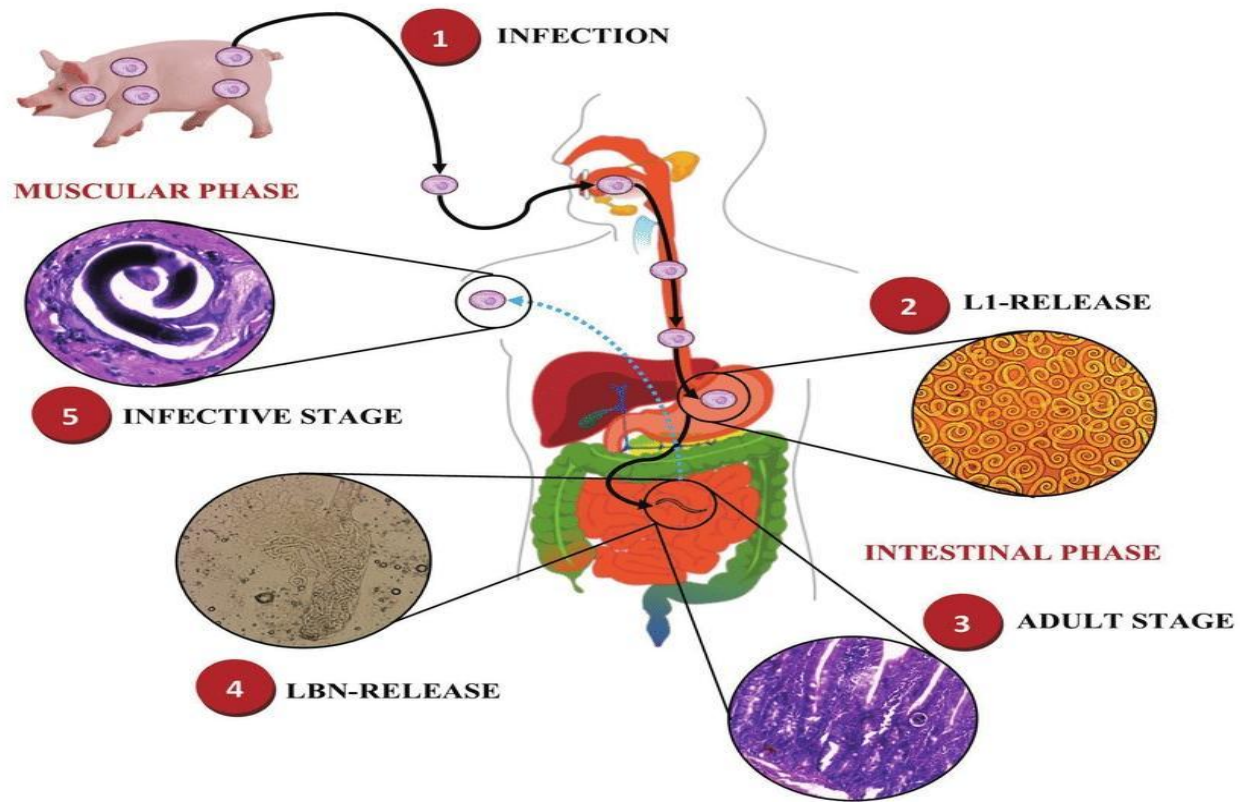
Life cycle of *Trichinella spiralis*

- ▶ To begin its **lifecycle**, **T. spiralis** adults invade the intestinal wall of a pig, and produce larvae that invade the pig's muscles. The larval forms are encapsulated as a small cystic structure within a muscle cell of the infected host.

Life cycle



Life cycle



Phathogenecity

- ▶ Life Cycle & **Pathology of Trichinella spiralis.** < Infection occurs by ingesting encysted larvae in undercooked meat. < The larvae excyst and develop to adults in the small intestine. < Adults attach to the intestinal mucosa and being to release larvae in one week.

Pathogenesis

- ◆ Causes Trichinosis
- ◆ Three stages of pathogenesis:
 - ◆ Stage 1: penetration of adult females into the mucosa:
 - ◆ 12 hours – 2 days after infection
 - ◆ Low grade infection
 - ◆ Worms migration in intestinal epithelium causes:
 - ◆ Traumatic damage to the host tissues
 - ◆ Inflammation
 - ◆ Nausea, vomiting, diarrhea,
 - ◆ Sweating
 - ◆ Respiratory difficulties
 - ◆ Red skin blotches
 - ◆ Stage ends with facial edema and fever

Pathogenicity

Pathogenesis:

1--Penetration of the adult females into mucosa

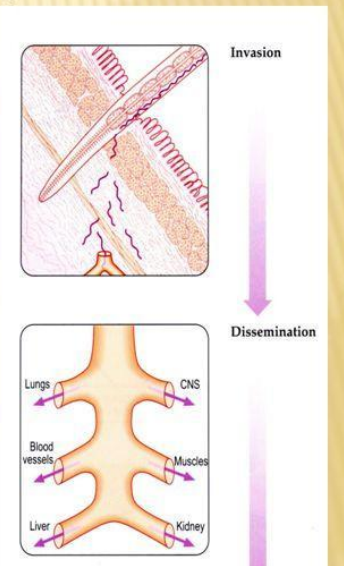
The first symptoms appear between **1- 2 days** after ingestion.

The worms migrating in the **intestinal epithelium**

Inflammation of duodenal and jejunal mucosa:

This causes:

- ✗ inflammation,
- ✗ nausea,
- ✗ vomiting,
- ✗ sweating, and diarrhea.



Diagnosis

- ▶ **Trichinella** infections are most often **diagnosed** in the laboratory based on **detection** of antibodies to excretory/secretory **Trichinella** antigen by ELISA or IFA. Testing is rarely positive in early disease. IgG antibodies can be detected approximately 12 to 60 days postinfection.

Diagnosis

DIAGNOSIS

- ▶ Muscle biopsy is used for trichinosis detection.
- ▶ Several immunodiagnostic tests are also available;
 - Immunoassays, such as ELISA.
 - Serological tests include a blood test for eosinophilia, increased levels of creatinine phosphokinase, IgG, and antibodies against newly hatched larvae.

Clinical features

Trichinella spiralis-Clinical features

- Second stage



Treatment of trichilla spiralis

TRICHINELLA SPIRALIS

- **Intestinal helminths, and other tissue Nematode**
- **Intestinal infection ,in which adult worms are found in the mucosa of the intestine and encystment of larvae are found in the muscle.**
- **Parasite of carnivorous mammals, especially common in rats and in swine fed uncooked.**
- **ONE SPECIES, *Trichinella spiralis*, IS A PARASITE OF MAN.**
- **ANOTHER SPECIESES :**
 - * *Trichinella nativa* (Kutub)
 - * *Trichinella nelsoni* (Africa)
 - * *Trichinella britovi* (Europe)
 - * *Trichinella pseudospiralis*

Control and prevention

- ▶ Infection by **Trichinella spiralis** is obtained by eating undercooked meat infected with larvae. Thus, cooking the meat (especially pork and bear meat) well to kill the infective larvae will **prevent** one from acquiring an infection.

Good bye

