

# Crimea state medical university

Trichinella Spiralis

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# INTRODUCTION

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

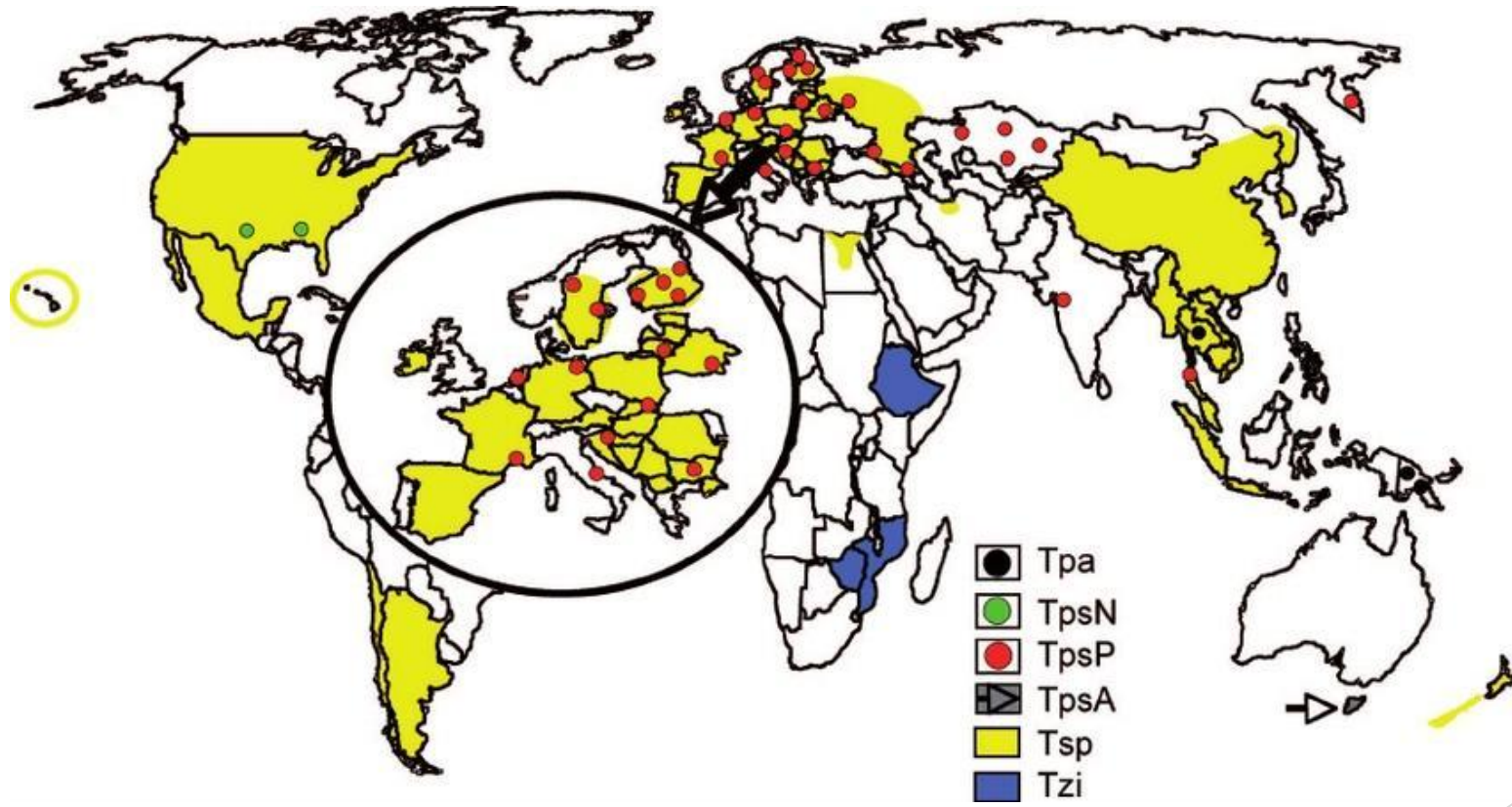
# Classification of *Trichinella spiralis*

## 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:**

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### 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.

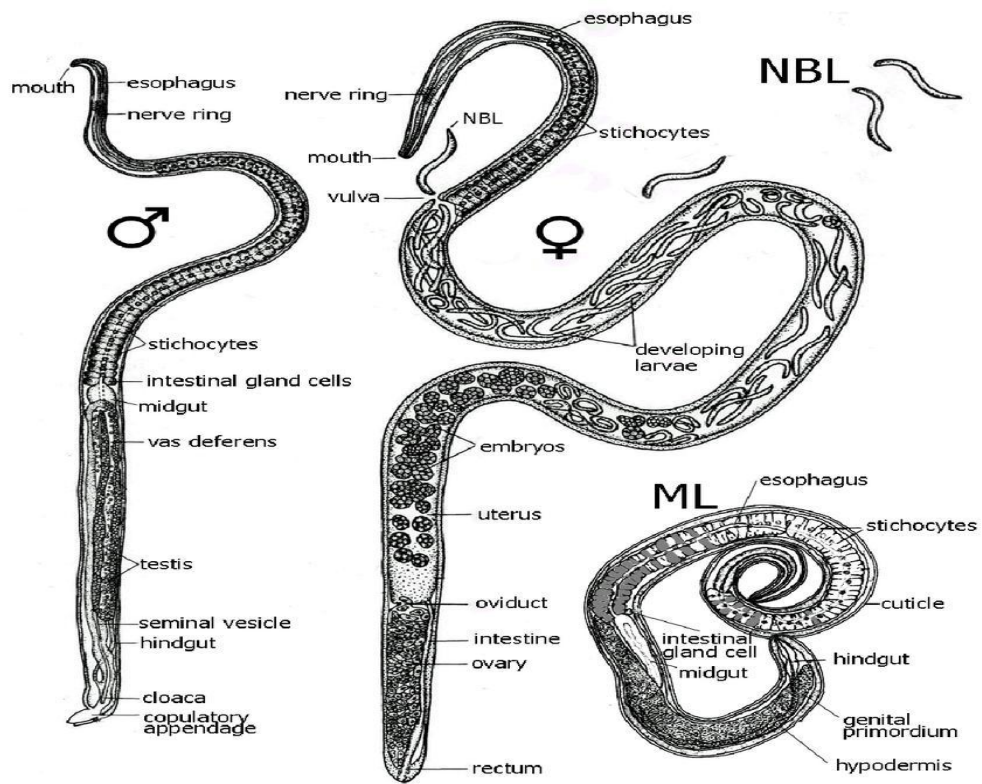
Size: 3.5-5cm in length

### 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

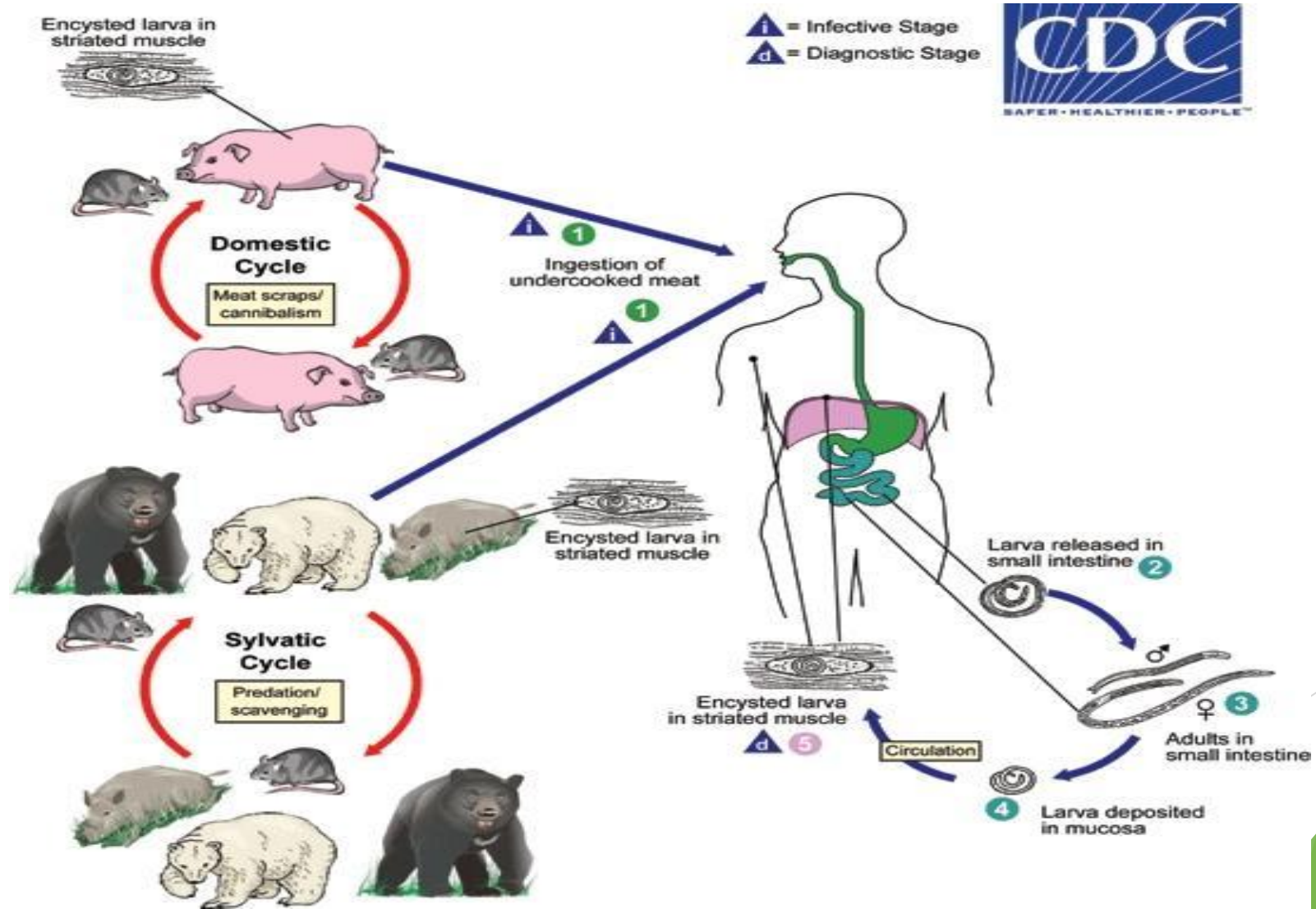




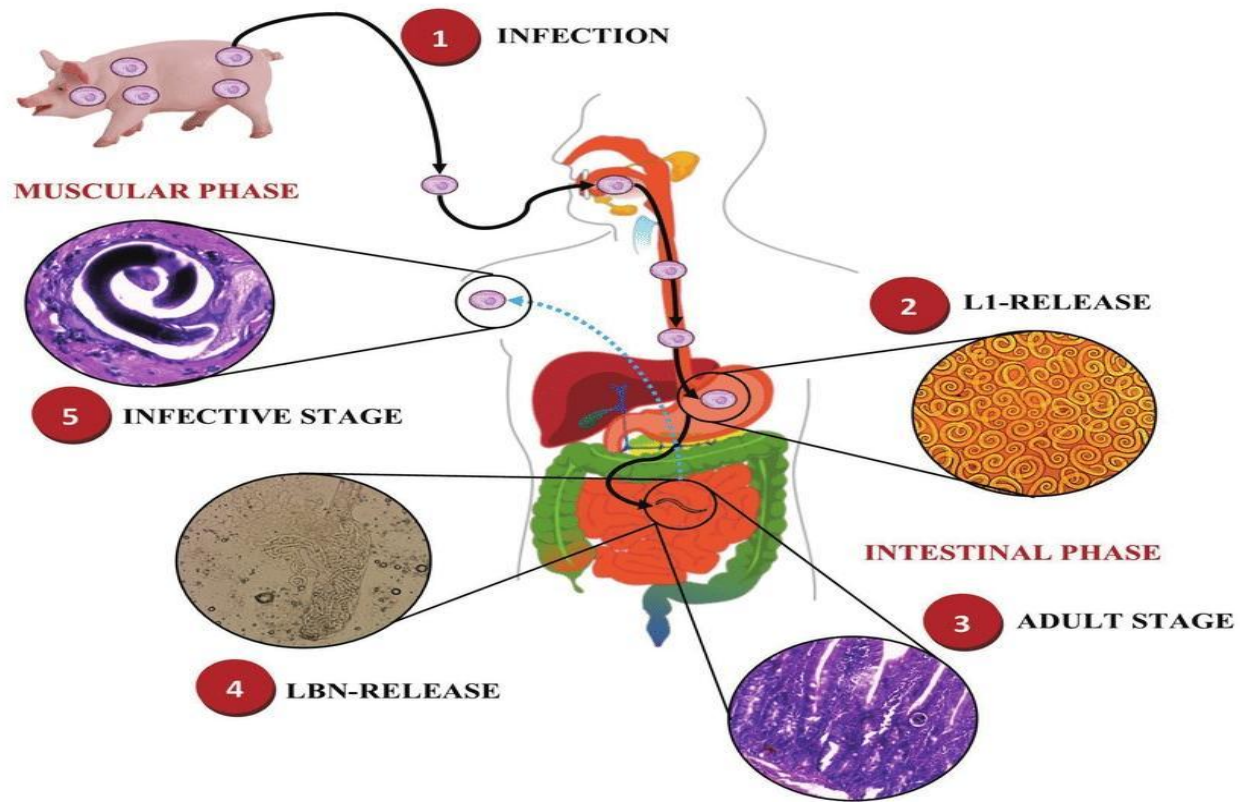
# Life cycle of *Trichinella spiralis*

- ▶ 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

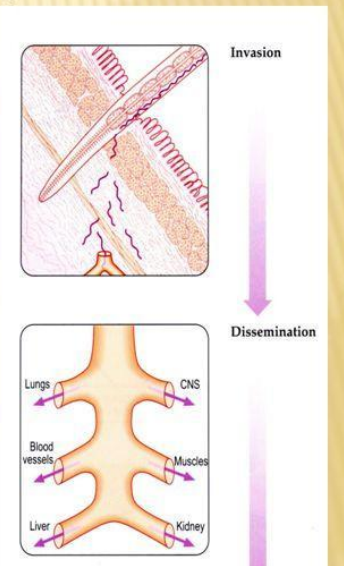
The first symptoms appear between **1- 2 days** after ingestion.

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 encysment 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

