

Lecture 12



Parasitic Helminths and Arthropod Agents and Vectors
of Diseases

- Additional Notes
- Important
- Explanation
- Examples

OBJECTIVES

- Name the three main groups of parasitic helminthes and their characteristic morphological features.
- Describe the life cycle of *Ascaris lumbricoides* as an example of parasitic helminthes.
- Discuss the role of arthropods as agents and as vectors of diseases in humans.
- Give examples of the main arthropod vectors of diseases.

Parasitic Helminthes:

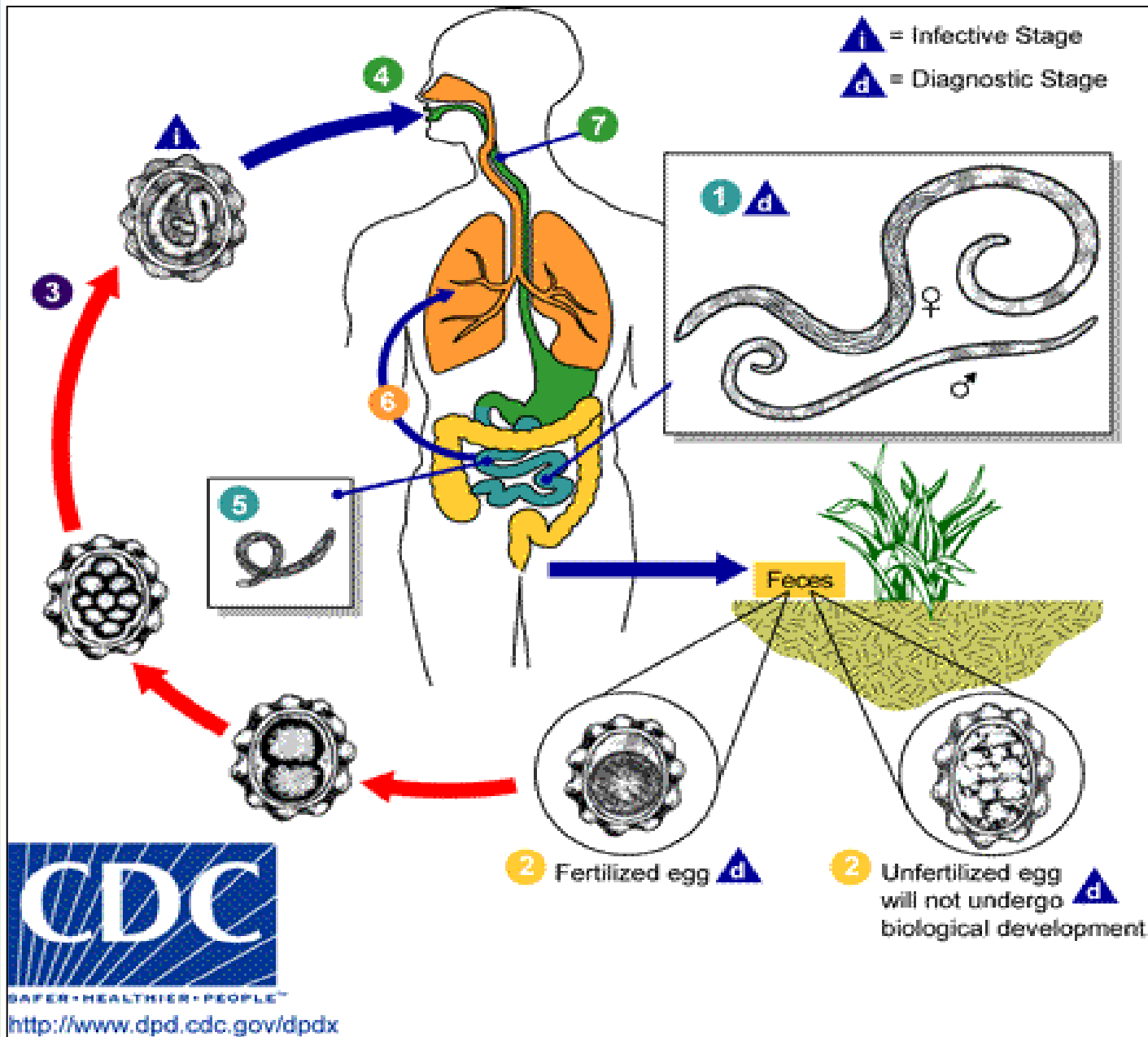
1. Nematodes:

General features:

- ✓ Elongated worm, cylindrical, unsegmented and tapering at both ends.
- ✓ Variable in size.
- ✓ Sex separate and male is smaller than female.

Location:

- ✓ Intestinal nematodes e.g. *Ascaris lumbricoides*
- ✓ Tissue nematodes e.g. Filarial worms



Adult worms live in the lumen of the small intestine. A female may produce up to 240,000 eggs per day, which are passed with the feces. Fertilized 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 (10-14 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.

2. Trematodes:

Leaf-like, unsegmented worms

e.g. *Bilharzia* worms:

- *Schistosoma mansoni* causing intestinal schistosomiasis
- *Schistosoma haematobium* causing urinary schistosomiasis

3. Cestodes:

Tapeworms, segmented

e.g. *Taenia saginata* the beef tapeworm.

■ Arthropods include 3 classes:

- ✓ Insecta e.g. mosquitoes, flies
- ✓ Arachnida e.g. scorpions, spiders
- ✓ Crustacea e.g. Cyclops

MEDICAL IMPORTANCE OF ARTHROPODS

- As aetiologic agents (causes) of diseases:
 - ✓ Tissue damage
 - ✓ Induction of hypersensitivity reactions
 - ✓ Injection of poisons
 - ✓ Entomophobia⁽¹⁾
- As vectors of diseases:
 - ✓ Mechanical transmission: simple carriage of pathogens
 - ✓ Biological transmission: cyclical, propagative, cyclopropagative
 - ✓ Transovarian transmission

⁽¹⁾The fear of insects

IMPORTANT ARTHROPOD VECTORS FOR HUMAN DISEASES

- House fly: mechanical transmission of many viruses, bacteria and parasites.
- Mosquitoes:
 - ✓ Anopheles: malaria filariasis
 - ✓ Culex: filariasis, viruses
 - ✓ Aedes: yellow fever, dengue fever, rift valley fever
- Sand fly: leishmania and sand-fly fever virus

Quiz

1..... is an example of intestinal nematodes:

- a) *Ascaris lumbricoides* b) *Taenia saginata* c) Filarial worms

2.Arthropods include:

- a) 4 Classes b) 5 Classes c) 3 Classes

3.Sand fly cause:

- a) *Leishmania* b) Malaria c) Yellow fever

4.The medical importance of arthropods is only as vectors of diseases.

- a) T b) F