

VIVEKANANDA COLLEGE
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NAAC ACCREDITED "A" GRADE



Topic : SOIL BORNE DISEASES
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SOIL BORNE DISEASES

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Introduction :

- ▣ Soil is home to a remarkable array of biodiversity with some estimates stating that 25% of the Earth's species find their home in the soil.
- ▣ The vast majority among these organisms are not of any threat to human health, but rather function to provide numerous ecosystem services which emerge through the multitude of complex interactions between organisms within the soil and the soil itself.
- ▣ These ecosystem services range from those which are vital for maintaining life on Earth, such as the formation of soil, the cycling of nutrients with the result of maintaining soil fertility, and the filtering of water, as well as provision of useful compounds such as antibiotics, the majority of which have been isolated from soil organisms.

Some soil borne human diseases

1. Actinomycetoma – Actinomycetes (F)
2. Anthrax – *Bacillus anthracis* (B)
3. Botulism – *Clostridium botulinum* (B)
4. Campylobacteriosis – *Campylobacter jejuni* (B)
5. Leptospirosis – *Leptospira interrogans*(B)
6. Tetanus – *Clostridium tetani* (B)
7. Aspergillosis – *Aspergillus* sp. (F)

F = Fungi

B = Bacteria

8. Blastomycosis – *Blastomyces dermatitidis* (F)
9. Coccidioidomycosis- *Coccidioides immitis* (F)
10. Lyme disease – *Borrelia* sp.(B)
11. Ascariasis – *Ascaris lumbricoides* (N)
12. Amoebiasis – *Entamoeba histolytica* (P)
13. Cryptosporidiosis – *Cryptosporidium* sp.
14. Giardiasis – *Giardia lamblia* (P)
15. Toxoplasma – *Toxoplasma gondi*

F stands for Fungi

B stands of Bacteria

N stands for Nematodes

P stands for Protozoa

Ascariasis:

- ▣ It is an infection of intestinal tract caused by *Ascaris lumbricoides*

Infective stage : Fecal matter contaminated with Ascaris eggs

Environmental Factor : it is a soil transmitted helminth. Eggs remain viable in soil under favorable condition.

Transmission :

1. Fecal oral route.
2. Spread by contaminated fingers or by direct ingestion of infected soil.

Symptoms :

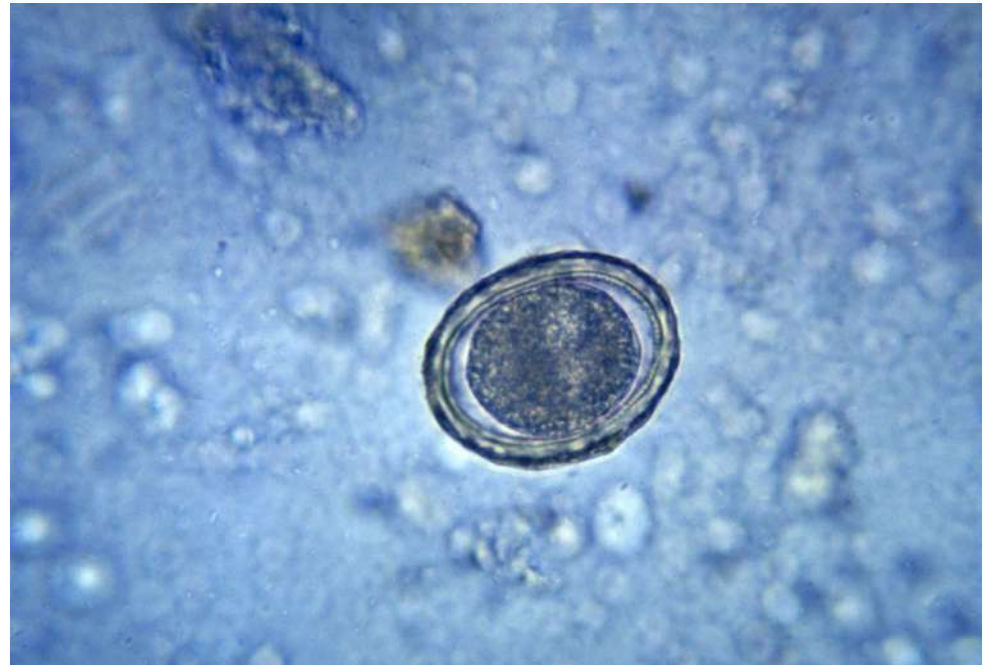
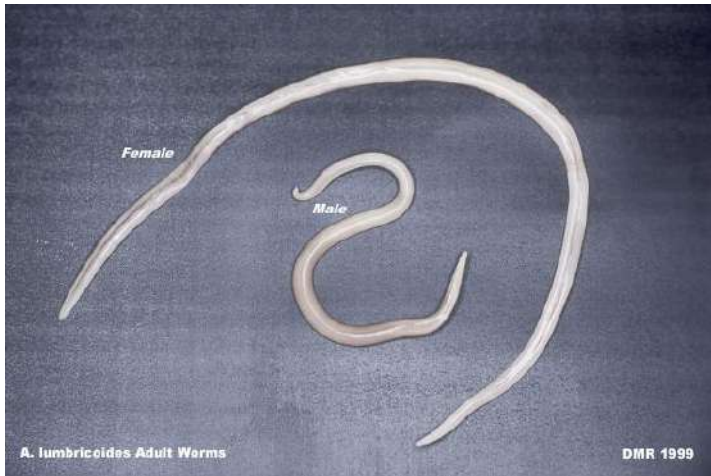
1. Nausea,
2. Abdominal pain,
3. Cough,
4. bronchitis,
5. diarrheal symptoms may cause intestinal obstruction.

Control :

1. Sanitary disposal of human excreta.
2. Safe drinking water.
3. Hygienic habit and health education.

Drugs : Piperazine and Mebendazole

Adult worm and fertilized egg



Hookworm infection:



Occurrence and infective stage of hook worms

It is a common hook worm infection, the disease is prevalent in tropical and sub tropical region favor egg hatching. The disease was prevalent in India.

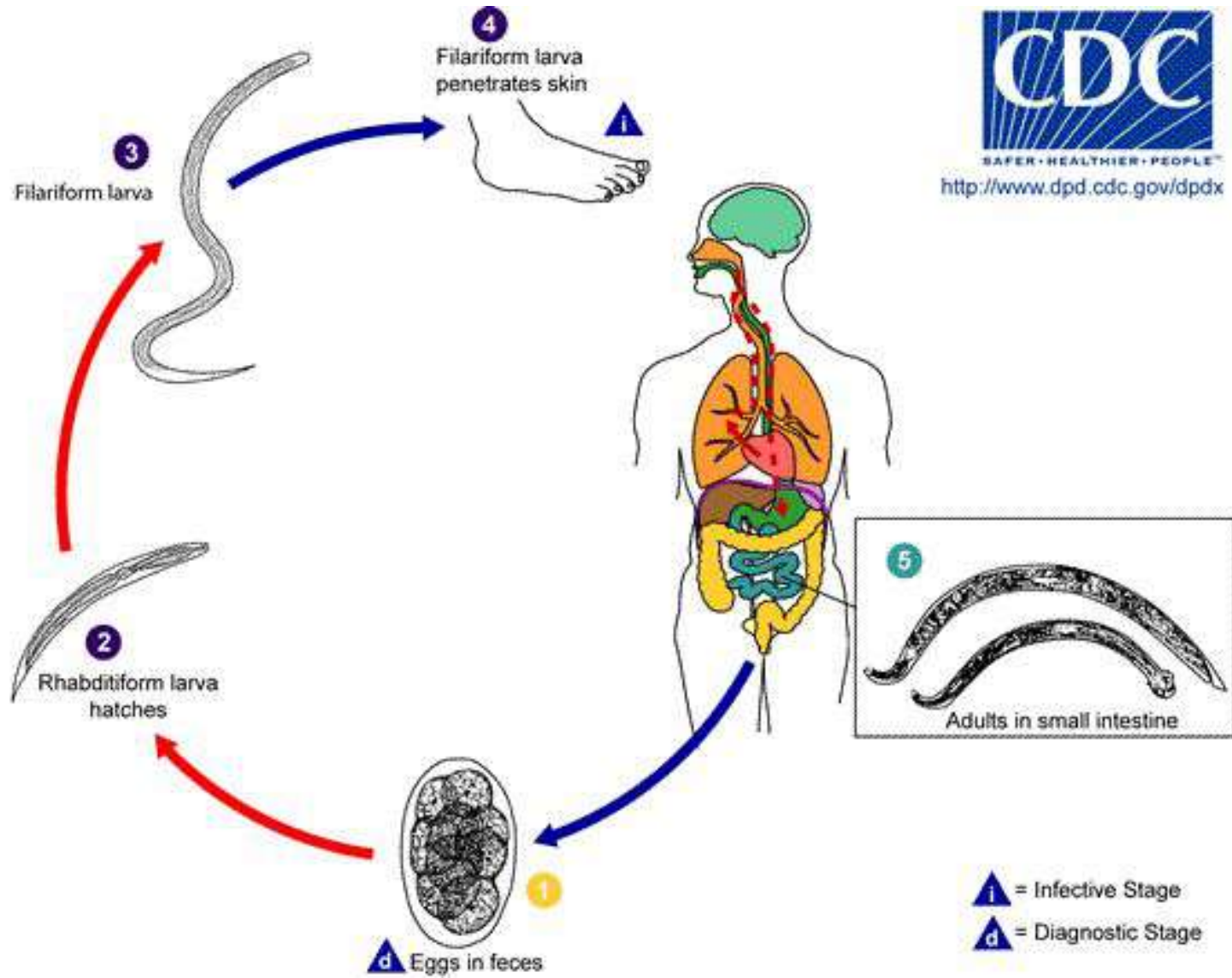
Infective stage :

1. Fecal matter contaminated with hook worm eggs.
2. Soil contaminated with infective larvae.

Environmental Factor :

Warm moist topsoil is favorable for the larval growth.

Life cycle



Symptoms of hook worm Infections

1. Abdominal cramp and other acute Diarrhoeal symptoms.
2. Infection causes chronic blood loss – Anemia and depletion of body's iron balance and retard physical growth.
3. It may cause dermatitis and creeping eruptions. Also produce lung lesions, Bronchopneumonia and Bronchitis.

Prevention

Soil borne bacterial infections

1. **Tetanus** :

It is acute infection caused by an exotoxin of *Clostridium tetani* , which is a Gram positive, anaerobic and spore forming bacterium

Natural habitat of this bacterium is soil and dust but the spores can survive for years in the nature

Environmental factor

Occurrence depends on soil type, agriculture and animal husbandry. The environmental factors are compounded by social factors like sanitation and Hygiene habits.

▣ **Transmission :**

Infection is acquired by contamination of wounds with tetanus spores. The range of injuries and accidents which may lead to tetanus includes a trivial pin prick, skin abrasion, puncture, bites and other injuries.

- Symptoms :
- Tetanus is clinically characterized by muscular rigidity which persists throughout the illness and painful spasms.

Treatment :

1. Active immunization (DPT vaccine)
2. Passive Immunization
3. Antibiotics

Tetanus Patient



Anthrax

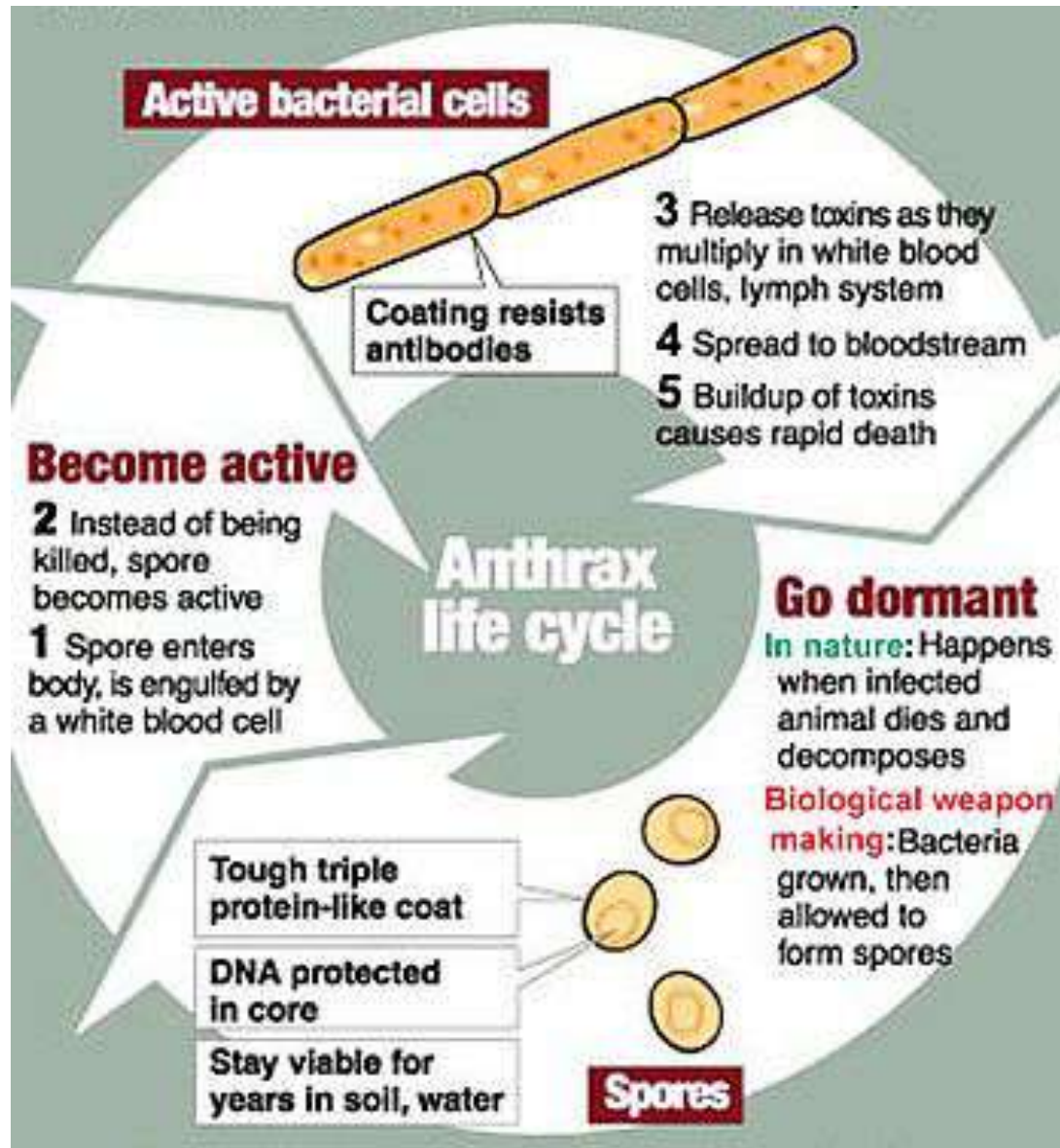
- Causative agent : *Bacillus anthracis*
- Mode of transmission :

Infection in human is acquired by inhalation of infective spores. Spores germinate rapidly in human tissues. Infection in animal is acquired by ingestion of spores while grazing.

Symptoms :

1. Initially cold symptoms, within days severe breathing problems starts
2. Acute intestinal tract inflammation
3. Nausea, Vomiting and severe diarrhea
4. 25-30 % mortality if untreated

Anthrax - disease cycle



- **Treatment :**

1. Protein capsules
2. Vaccination
3. Antibiotic treatment

Botulism

The Bacteria *Clostridium botulinum* is the causative agent of this disease.

C. botulinum is a well defined species of bacterium rather refers to distinct groups of bacteria that produce seven distinct toxins.

It occurs in mammals, humans, fish and birds.

C. Botulinum is a spore forming anaerobic bacterium whose habitat is soil.

It is a soil borne infection occurs generally through eating contaminated food or transmitted directly into the wounds from the contaminated soil.

- **Symptoms :**

1. Fatigue, weakness, vertigo followed by dry mouth difficulty in speaking and swallowing
2. Blurred vision
3. Weakness in neck and arm after which respiratory muscles and muscles of lower body become affected (paralysis)

Treatment

1. Vaccination
2. Antibiotics
3. Anti toxins

leptospirosis

Causative agent : *Leptospira sp.*

It is an anaerobic spirillum, found in aquatic ecosystem as well as soil

Mode of transmission :

Contact with fresh water, soil or possibly vegetation which is contaminated with urine of infected animals

Environmental factors :

It prefers acidic to neutral soil where it can thrive up to 74 days.

It enters in body through ingestion of contaminated food, water, broken skin or mucous membrane

Disease cycle :

How Leptospirosis is spread?

People contract the disease by direct contact with contaminated water.



- **Symptoms**

It has 2 phases- 1st phase : involves flu like symptoms, strong headache. Then disease passes through a brief moment in which the patient may be asymptomatic.

2nd phase : this includes meningitis, renal failure and live damage.

Control and treatment :

1. Improved hygiene and sanitation
2. Proper cooking of food and boiling of water
3. Sanitary disposal of human excreta and urine
4. Antibiotic treatment

Happy reading ..