Topic: Causes of Plant Diseases

Objective: **To introduce the students about Biotic, Mesobiotic and Abiotic causes of plant diseases**

Learning outcomes: **At the end of the lecture students will be able to understand about important plant pathogenic organisms categorized under Biotic, Mesobiotic and Abiotic with examples**

WELCOME



Causes of Plant Diseases

Plant diseases are caused by a variety of pathogens…

- **Biotic (Animate) causes**
- **Mesobiotic causes**
- **Abiotic (Inanimate) factors**

1. Biotic (Animate) causes:

This category includes the pathogens which are animate or living or cellular organisms. They are:

a) Bacteria: bacteria which are unicellular prokaryotic microorganisms lacking true nucleus.

➢ **Examples of diseases caused by bacteria are:**

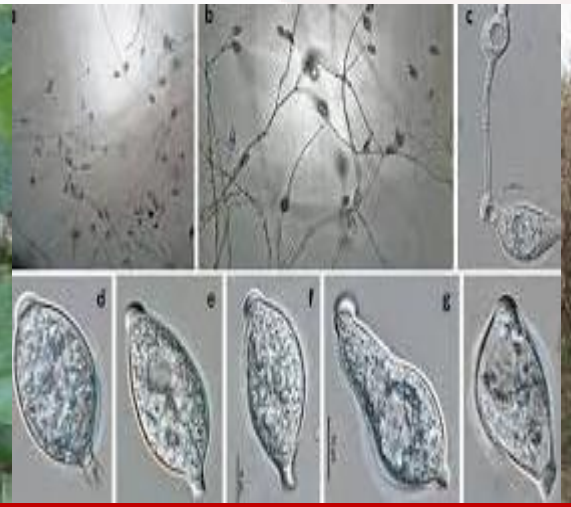
- soft rot of vegetables caused by- *Erwinia sp.*
- Bacterial leaf blight of rice- *Xanthomonas campestris* pv. *oryzae*
- Citrus canker is caused by *Xanthomonas axonopodis*, etc.

soft rot of carrot caused by- *Erwinia carotovora*

b) Fungi: Fungi are eukaryotic, achlorophyllous, spore bearing, filamentous organisms with absorptive types of nutritional habits, they causes several diseases in plants, animals as well as humen being. About 80% of plant diseases are caused by fungi only.

Some Examples are:

- **Late blight of potato** is caused by the- *Phytophthora infestans*.
- Early **blight of potato** is caused by the -*Alternaria solani*,
- wilt of pigeonpea- caused by- ***Fusarium udum***,
- Rust of wheat- caused by- Puccinia spp.

d) **Protozoa**: They are also single-celled microscopic animals which causes several disease in animals as well as plants.

Example:

Wilt of Coffee, Phloem necrosis of coffee and wilt of coconuts are caused by flagellate protozoan agent.

e) **Algae**: These are simple, non-flowering, mainly single-celled having chlorophyll but lack of true stems, roots, leaves, and vascular tissue. Red rust of mango, coffee, tea (*Cephaleuros virescens*)




c) **Nematodes:** The **nematodes** are non-segmented, vermiform, elogeted thread like microorganism
which causes disease in plants:

Examples: Root knot of vegetables, ear cockle of wheat, citrus decline etc.

c) **Parasitic flowering plants** (Phanerogamic plant parasites):

Examples: *Dodder, Striga, Orobranche, Loranthus,* etc.





2. Mesobiotic causes:

These are the disease incitants which are neither living nor non-living.

Viruses: They are infections agents made up of one type of nucleic acid (RNA or DNA) enclosed in a protein coat.

Examples :

Potato leaf roll, Leaf curl of Tomato and Chillies, and Mosaic of Tobacco.

2. Mesobiotic causes cont…

Viroids: They are naked, infectious strands of nucleic acid.

Examples: Potato spindle tuber, chrysanthemum stunt, Cadang cadang of coconut palm etc.



3. Abiotic (Inanimate) factors:

They include mainly the deficiency or excess of nutrients, light, moisture, aeration, abnormality in soil condition, atmospheric impunities etc.

Some examples are:

- Black tip of mango (due to Co and SO2 toxicity),
- Khaira disease of rice (due to Zn deficiency),
- Whiptail of cauliflower (Mo deficiency),
- Hollow and black heart of potato (due to excessive accumulations of CO2 in storage),
- Bitter pit of apple (due to Ca deficiency).





References:

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THANK YOU !