

GENERAL CHARACTERISTICS AND REPRODUCTION OF BACTERIAL PLANT PATHOGENS

Aim: To Acquaint the students with general characteristics and reproduction of bacterial plant pathogens

General Characteristics

Bacteria are second most important organisms which cause plant diseases.

- They are prokaryotic single celled mostly achlorophyllous organisms whose body is surrounded by cell wall and nuclear material is not surrounded by membrane.
- They lack membrane bound organelles such as mitochondria or plastids and also a visible endoplasmic reticulum.
- Most of the bacterial species are saprophytes living on dead organic matter. There are about 200 bacterial species which are plant pathogenic.
- Morphologically the bacteria are rod shaped (bacilli), spherical (cocci), spiral (spirilli), comma shaped (vibrios) or thread like (filamentous).
- *Streptomyces* has a filamentous branched hypha-like structure, sometimes mistakenly called as **ray fungi**; and mycoplasma have no definite shape due to lack of cell wall.
- In young cultures the rod shaped bacteria range from 0.6 to 3.5 μm in length and from 0.5 to 1 μm in diameter (0.6-3.5 x 0.5-1 μm size).
- Single bacterium mostly appears as hyaline or yellowish white under the compound microscope, when grown on a medium, soon a colony is formed.
- The colonies of most of bacteria have a whitish or greyish appearance but some of them develop yellow, red or other colours.

Bacterial Cell Structure

- A bacterium has a thin, relatively tough, rigid **cell wall**, and a distinct three layered but thin cytoplasmic membrane.
- Most bacteria have a **slime layer** made up of viscous gummy material. Slime layer has bacterial immunological property.
- When the layer is thick and firm, it is called **capsule**.

- Generally plant pathogenic bacteria lack capsule but some of them like *Pseudomonas* and *Xanthomonas* produce slime.
- Slime layer is mostly composed of polysaccharides but may rarely contain amino sugars, sugar acids, etc.

Flagella

- Most of the plant pathogenic bacteria have delicate thread like **flagella**, which are usually longer than the cell
- They are the organs of locomotion.
- The arrangement of flagella on bacterial cell is an important taxonomic character that aid in bacterial classification.
- This arrangement may be
 - **Monotrichous**- with one polar flagellum
 - **Lophotrichous** -tuft of flagella at one end
 - **Amphitrichous**- at both the ends
 - **Peritrichous** - distributed all around the cell or surface.
 - **Atrichous**- bacteria lacking flagella.