

# History of plant pathology

## Definition

Plant pathology or phytopathology is the science, which deals with the plant diseases.

**Phytopathology** ( Greek Phyton = plant + pathos - disease, ailments + logos = discourse, knowledge) is the branch of agricultural, botanical or biological science which deals with the cause, etiology, resulting in losses and management methods of plant diseases.

Plant pathology can also be defined as the study of the nature, cause and prevention of plant diseases.

Plant pathology has the following major objectives.

1. To study biotic (living), mesobiotic and abiotic (non-living and environmental) causes of diseases or disorders
2. To study the mechanisms of disease development by pathogens
3. To study the plant (host)-pathogen interaction in relation to environment
4. To develop methods of management of plant diseases

## Plant diseases

Plant diseases are recognized by the symptoms (external or internal) produced by them or by sick appearance of the plant.

## Other definitions

Disease is a malfunctioning process that is caused by continuous irritation, which results in some suffering producing symptoms. or

A plant is said to be „diseased“ when there is a harmful deviation from normal functioning of physiological process

The Greek Philosopher, Theophrastus (370-286 B.C.) was the first to study and write about the diseases of trees, cereals and legumes.

Book 'Enquiry into plants'

Theophrastus recorded his observations, imaginations and experiences but they were not based on any experiments.

## Mycology

**1675** - Dutch worker Anton von Leeuwenhoek developed the first microscope.

**1729** - Italian botanist P. A. Micheli proposed fungi comes from spores; **father of Mycology**

**1845** - Irish Potato famine due to *Phytophthora infestans* caused starvation of million and immigration of 1.5 million people.

**1861** -Anton de Bary (Germany) worked out the life cycle of potato late blight and first to prove experimentally *Phytophthora infestans* is the cause of potato late blight.

He is the Father of **Modern Plant Pathology**

**1904** – R. H. Biffen first to show that resistance to pathogens in plants can be inherited as a Mendelian character; pioneer in genetics of plant disease resistance.

**1918** -E.J.Butler published book on Fungi and Disease in Plants; he made exhaustive study on Indian fungi and the diseases caused by them.

Father of Modern Plant Pathology in India

1943 – Great Bengal Famine due to *Helminthosporium oryzae* caused death of 2 million people in India.

1945 -J. G. Horsfall explored the mechanism of fungicidal action.

1966 -van Schmelting and Marshall Kulka were the first to find out systemic fungicides (oxathiin compounds – carboxin and oxycarboxin).

## Plant Bacteriology

1683 – Anton von Leeuwenhoek first observed bacteria.

1876 -Louis Pasteur and Robert Koch - proved that anthrax disease of cattle was caused by specific bacterium

1876 -Robert Koch of Germany described the theory called "Koch's postulates." He established the principles of pure culture technique



**1882** -American Plant Pathologist -T. J. Burrill first time proved that fire blight of apple and pear caused by a bacterium (known as *Erwinia amylovora*)

**1952** – S. A. Waksman won Nobel prize for the discovery of streptomycin.

**1980** – D. W. Dye *et al.* introduced the pathovar in the taxonomy of plant pathogenic bacteria.

# Virology

1886 -Adolf Mayer described a disease of tobacco called as Tobacco Mosaic Virus disease.

1898 -M.W. Beijerinck -a Dutch microbiologist and founder of virology proved that the virus inciting tobacco mosaic is not a microorganism. He believed it to be *contagium vivum fluidum* (infectious living fluid).

He was the first to use the term virus, which is the Latin word for poison.

**1935** -W. M. Stanley proved that viruses can be made as crystals. He got Nobel Prize in 1946.

**1971** -T. O. Diener discovered viroids

## **Phytoplasma**

1967 – Doi *et al* and Ishiie *et al*, the Japanese scientists found that mycoplasma-like organisms (MLO) could be responsible for the disease of the yellows type.

## **Spiroplasma**

1972-Davies *et al.*, observed that a motile, helical wall-less microorganism associated with corn stunt diseases, which could be cultured and characterized and they named it as spiroplasma.