

MYCOLOGY PART -7

ECONOMIC IMPORTANCE OF FUNGI

1. ROLE OF FUNGI IN MEDICINE:

- Some fungi produce substances which help to cure diseases caused by the pathogenic microorganisms. These substances are called **the antibiotics**.
- In small amounts to the feed of slaughter animals promotes rapid growth and improves the quality of the meat products.
- Penicillin from *Penicillium notatum*
- Streptomycin is obtained from *Streptomyces griseus*
- The plasmodia of certain species of Myxogastres have been reported to yield soluble antibiotics

2. ROLE OF FUNGI IN INDUSTRY:

a) **Alcoholic fermentation:**

- The yeasts secrete the enzyme complex called **zymase** which brings about conversion of sugar into alcohol.
- *M. rouxii* and some species of *Rhizopus*, *Aspergillus flavus* is used in the production of **African native beer**

b) **Enzyme preparations:**

- on the basis of his intensive study of the enzymes produced by *Aspergillus flavus-oryzae* series has introduced in the market a few products of high enzymic activity.
- Invertase is extracted from *Saccharomyces cerevisiae*. It has many industrial uses. It hydrolyses sucrose to a mixture of glucose and fructose.
- Cultures of *Aspergillus niger* and *A. oryzae* on trays of moist, sterile bran yield a well-known amylase which contains two starch splitting components

c) **Preparation of organic acids:**

- Oxalic acid is the fermentation product of *Aspergillus niger*.
- Citric acid is made by mould fermentation.
- The gluconic acid is prepared from sugars. The moulds chiefly employed for this purpose are some species of *Penicillium* and *Aspergillus*.
- Gallic acid as the fermentation product of an extract of tannin by *Aspergillus gallomyces*.

d) **Gibberellins:**

- Produced by the fungus *Gibberella fujikuroi* which cause a disease of rice accompanied by abnormal elongation

e) **Cheese Industry:**

- The moulds concerned are *Penicillium camemberti* and *P. caseicolum* in the production of Camembert and Brie type cheese.
- *P. roqueforti* in the production of Roquefort Gorgonzola and Stilton type cheese.

3. ROTTING OF WOOD

- Some fungi results in degradation of cellulose and lignin and cause rotting of wood
- Eg., *Polyporus*, *Ganoderma*

4. DEGRADATION OF LIGNIN

- Fungi degrade lignin by secreting enzymes collectively termed “*ligninases*”.

5. DECOMPOSITION OF ORGANIC MATTERS

- Fungi produce a variety of *exoenzymes* to digest nutrients
- These enzymes are either released into the substrate or remain bound to the outside of the fungal cell wall.

ENTRI

- Large molecules are broken down into small molecules, which are transported into the cell by a system of protein carriers embedded in the cell membrane.

6. FUNGAL TOXINS AND HUMAN HEALTH

- Some fungi have the ability to produce toxic secondary metabolite call **mycotoxins**
- which have a role in the infection of some diseases in both humans and other animals.
- The adverse health effects of mycotoxins range from acute poisoning to long-term effects such as immune deficiency, Liver and kidney fibrosis and cancer.