

Industrial Importance of Bacteria & Fungi

Man has utilised the activity of bacteria for many industrial process. There is not even a single day that we are not benefited by this small bacteria. These bacteria are useful to us in many ways. They are important to us as decomposers and increasing the soil fertility by nitrogen fixation. They are also used as source of antibiotics and in preparation of serum and vaccines. They are widely used in industry. These important uses in industry are mentioned below.

1) In butter and Cheese Industry: - The souring and curdling of milk is depended upon lactic acid bacteria. It take place in two steps. First lactose sugar of the milk is fermented to glucose by enzyme lactase produced from lactic acid bacteria. In the second step glucose is transformed to lactic acid and with the formation of lactic acid the milk sours and protein present in the milk coagulates and thus milk is transformed into curd of whey.

2) In production of beverages: -

Coffee and cocoa industry is also dependent upon bacterial action. The cocoa has a white bitter covering which is digested by bacteria to give characteristic colour, flavour and aroma.

3) In Leather Industry, bacteria is very much useful for the process called tanning of hides.

4) In the Production of Linen: - In linen preparation there is an important process called retting in which the hemp and the flax are submerged in water where softer part of plants are decomposed.

by bacteria. The dough of those which are left behind are used for preparation of clothes and ropes and bags.

Many bacteria excrete metabolic waste of great commercial value.

1) Lactic acid: It is useful in tanning industry.

2) Citric acid: It is used to give colour and flavour to beverages, sweets and food stuffs.

3) Vitamin B is product of fermentation of sugars and starch by *Clostridium acetobutylicum*.

4) By the action of certain bacteria on cooked corn starch, ethyl alcohol, acetone and butyl alcohol is prepared.

Industrial Importance of Fungi:

Fungi are used both in brewing industry and baking industry. In both the industry yeast is very important. In brewing industry alcohol is the main product but carbon dioxide is solubilized and sold in market as dry ice as by product.

In baking industry CO_2 is useful and serves two purposes first, it causes dough to rise and secondly makes the bread light. The yeast cell present in the dough, produces CO_2 which is responsible for the production of alcohol as by product.

2) Enzyme preparation: - Some enzymes like Diastase, ptylase and Taka a Diastase produced by *Aspergillus flavus oryzae* is used for dextrinization of starch and desizing of textiles.

Amylase is prepared from *Aspergillus niger* & *A. oryzae*. Invertase is prepared from *Saccharomyces*, *Corynebacterium*.

vii) Preparation of organic acid:- Some species of *Penicillium* and *Aspergillus* are employed for the purpose of production of oxalic acid, citric acid, gluconic acid & gallic acid. These acid prepared from fungi are cheaper than. Acid produced from citrus fruits.

viii) Gibberelline:-

This is a very important plant hormone responsible for growth and is prepared from *Gibberella fujikuroi*.

ix) Cheese Industry:-

Certain species of *penicillium* is used for ripening cheese which is added for characteristic texture and flavour.

x) Manufacture of Protein and Vitamins:-

The species of some yeast contain high percentage of protein of great nutritive value. A product of yeast called food yeast contains 15% protein and B group of vitamins. Some other species of moulds and yeast are important for the production of vitamin D.

A wide range of Antibiotics is commercially produced. The first known antibiotic *Penicillin* was prepared from *P. notatum*.

The other Antibiotics from fungi are *Streptomycin*, *Chlormycetin* and *Terramycin*. *Griseofulvin* is obtained from *penicillium griseofulvum* has antifungal properties. It is very much effective in fungal skin disease like ringworm and athlete's foot disease.

xi) For the Production of dyes:-

The fungal component of certain lichens produce coloured pigments that have been used as dyes in colouring fabrics and paints.

ORCHIL one of the dye is used to dye wollens.