Economics importance of fungi

Fungi include hundred of species which are of tremendous economic importance to man. In fact our lives are intimately linked with those of fungi. Hardly a days passes when we are not benefited or harmed by directly or indirectly by these organisms. They play important role in agriculture, by maintaining the fertility of the soil, yielding antibiotics. Some of the fungi are important research tools in the study of fundamental biological processes. Some of the fungi particularly molds and yeasts play a negative role by causing spoilage of stored goods such as foodstuffs, textiles, leather, rubber, plastics, timber etc.

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.** the term antibiotic, therefore, denotes an organic substance, produced by a microorganisms, which inhibits the growth of certain microorganisms. The use of antibiotics is not limited to disease treatment. The addition to certain antibiotics in small amounts to the feed of slaughter animals promotes rapid growth and improves the quality of the meat products.

The discovery of antibiotic agents as drugs is comparatively a recent history. The role of fungi in producing antibiotics substances was first established by Sir. Alexander Fleming in 1929. He extracted the great anitibiotic drug **Penicillin** from *Penicillium notatum.* It was the first anitibiotics to be widely used. Penicillin is an organic substance lethal to microbes. It is far more effective than ordinary drugs and germicides. It has no adverse effect on human protoplasm but kills bacteria especially gram-positive type. Penicillin is now produced on a commercial scale all over the world including India from the improved strains of *P. notatum* and *P. chrysogenum.*

**Grisofulvin-** which is recovered from mycelium of *Penicillium griesofulvin* and many others species has antifungal properties. It acts on the hyphae by interfering with wall formation. Consequently the hyphal tips curl and cease to grow. When administered orally it is absorbed in the body where it accumulates in the keratinized tissues of the epidermis and hair. It is effective against fungal skin disease such as ringworm and athlete’s foot disease.

1. **Role of fungi in industry-** The industrial uses of fungi are many and varied. In fact the fungi forms the basis of many important industries. There are a number of industrial processes in which the biochemical activities of certain fungi are harnessed to good account. A brief sketch of some of the most important of these processes is given below:-
2. **Alcoholic fermentation-**  Two important industries in India or rather over the world, these are **brewing** and **baking.** Both are depend on the fact that the fermentation of sugar solutions by yeasts produces ethyl alcohol and carbon dioxide.

In brewing or wine making industry alcohol is the important product. The other by-product which is carbon dioxide was formerly allowed to escape as a useless thing. Now carbon-dioxide is also considered a valuable by-product. It is collected, solidified and sold as “dry ice”.

In baking or bread making industry CO2 is the useful product. It serves two purposes:-

1. Causes the dough to rise
2. Makes the bread light.
3. **Enzyme preparation-**  enzymes are produced by *Aspergillus flavus-oryzae* series has introduced in the market a few products of high enzymic activity. These are **Digestin, Polyzime, Takadiastase etc.**
4. **Gibberellins -**  These are plant hormones produced by the fungus *Gibberella fujikuroi* which causes a disease of rice accompanied by abnormal elongation. Gibberellin is used to accelerate growth of several horticulture crops.
5. **Cheese industry-** certain fungi popularly known as the cheese moulds play an important role in refining of cheese. They give cheese texture and flavor. The two chief kinds of mould refined cheese are-
6. Camembert and Brie types. They are soft.
7. Roquefort Gorgonzola and Stilton types. They are green or blue veined cheese. The moulds concerned are *Penicillium camemberti* and *P. caseicolum* in the first type and *P. roqueforti* in the second type.
8. **Manufacture of proteins-**  As a supplement to the normal diet, some fungi particularly the yeasts are employed to synthesize proteins. The yeast (*Saccharomyces cerevisiae* and *Candida utilis)* contain high percentage of protein of great nutritive value. They are grown with ammonia as the source of nitrogen and molasses as the source of carbon. The manufactured protein are called *Food yeasts.* It contains 15% protein and B group of vitamins.
9. **Role of fungi in agriculture-** The fungi play both negative and positive role in agriculture. They have a negative value because they are the causative agents of different diseases of our crop, fruit and other economic plants.The more important dieases are:

**a). Damping off disease-** The seedlings of almost every type of plant grown as a commercial crop such as tomatoes, corn, cotton, mustard, peas, beans, tobacco, spinach, etc., are prone to this disease. It is caused by a species of Pythium.

**b).** **The potato blight (late blight of potatoes)-** is another destructive crop disease. It does a great damage to the potato tubers.

**c).** **Downy mildews of grapes-** It ruins the vine yards and thus causes heavy loss to the crop.

**d).** **Ergot disease of rye-** It is an important disease of cereal crop-rye. It results in the formation of poisonous sclerotia in the rye kernel. It is called *ergot* of rye. Ergot is highly poisonous to man. Ergot poisoning causing hallucinations, instantly and finally death.

**e).** **Apple scab-** It is a serious disease of the apple crop. It lowers the quality as well as quality of the fruit.

**f).** **Smut diseases- Smut disease** of corn, wheat, oat and other cereal crops cause serious reduction in the yield and quality of grain.

**g). Red rot disease of sugarcane-** It is a serious disease of sugarcane whose incidence has increased during the last few years particulary in the northern parts of country.