

ECONOMIC IMPORTANCE OF BACTERIA

Ques → Economic Importance of Bacteria with special reference to decomposers, Industrial importance and Medicinal values?

Ans: Introduction ⇒ When we look back from the period of Leeuwenhoek and recall his statement "Dear God, what marvels there are in a so small creature", then it seems that Bacteria are really unique structures because it is important to man and other living organisms of the world in many ways. They do at one hand a great service to the living world while on the other hand they are known to the general public as causative agent of chronic diseases. Thus Bacteria possess both positive and negative importance.

Beneficial species liberate fertilizer for growing crops, destroys sewage and other wastes. Activities of Bacteria have been utilized for various industrial purposes to produce valuable chemicals, Medicines and other essential products for human society.

BENEFICIAL ACTIVITIES ⇒ There are many kinds of bacteria whose presence on the earth are necessary. Following are the useful activities:-

① Bacteria and Soil fertility ⇒ [As decomposers] → of all the living organisms found in the soil → back

are the most active. They are specially abundant on the surface layers of the soil. These bacteria along with other soil organisms play a dominant role in soil fertility. In general they succeeded in converting insoluble materials into such forms that can be utilized by higher plants. Nitrogen is an essential ingredient of all living protoplasm. It makes about 80% of the atmospheric composition. It also occurs in the soil in the form of soluble compounds of nitrogen. Green plants are generally unable to use the

elementary nitrogen of the air. In nature, the presence of regular supply of these nitrates is insured by bacterial activities. These

(a) Bacteria are of two types:-

(1) Nitrogen fixing bacteria

(2) Nitrifying bacteria.

Nitrogen fixing bacteria are also of two types - some live free in the soil and others in the root nodules of leguminous plants. These bacteria are able to make use of atmospheric nitrogen and change it into nitrogenous product. The process of nitrogen transformation is called Nitrogen fixation. The examples of such bacteria are Azotobacter clostridium (soil living) and Bacillus species (root nodule).

Nitrifying bacteria convert free nitrogen into ammonium compounds. These

Ammonium Compounds are converted into nitrate by the activities of Nitrosomonas bacteria. In this way some bacteria increase the soil fertility by fixing nitrogen to them.

- (b) Some bacteria bring about the decomposition of proteins, fats, carbohydrates and other complex organic compounds into the bodies of plants and animals in the form of waste products. In this way they clear the earth from the waste products and mix them to the soil and air. These waste products after mixing with soil increase the fertility.

In this way bacteria are very much helpful in increasing the fertility of the soil.

- (2) Industrial Importance → The process of bacterial fermentation and its products are utilized in various industries.

- (i) Clostridium species of bacteria ferments carbohydrates producing Acetone, methyl alcohol and n-butyl alcohol. All the three have major industrial role.

- (ii) Very recently Vitamin B₂ has been discovered as a product of fermentation of carbohydrates by SPAN (1981). It is used in prevention of certain nervous disorder and other chronic diseases.

- (iii) Vinegar → The manufacture of vinegar is one of the oldest process in the human history.