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Editorial Note on Medical Microbiology & Diagnosis –Industrial Microbiology

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Editorial

Industrial microbiology is a branch of applied microbiology in which microorganisms are used in industrial processes; for example, in the production of high-value products such as drugs, chemicals, fuels and electricity. Industrial microbiologists study and solve problems related to industrial production processes. They may examine microbial growth found in the pipes of a chemical factory, monitor the impact industrial waste has on the local ecosystem, or oversee the microbial activities used in cheese production to ensure quality.

Introduction of mutations into an organism may be accomplished by introducing them to mutagens. Another way to increase production is by gene amplification, this is done by the use of plasmids, and vectors. The plasmids and/ or vectors are used to incorporate multiple copies of a specific gene that would allow more enzymes to be produced that eventually cause more product yield. The manipulation of organisms in order to yield a specific product has many applications to the real world like the production of some antibiotics, vitamins, enzymes, amino acids, solvents, alcohol and daily products. Microorganisms play a big role in the industry, with multiple ways to be used. Medicinally, microbes can be used for creating antibiotics in order to treat antibiotics. Microbes can also be used for the food industry as well. Microbes are very useful in creating some of the mass produced products that are consumed by people. The chemical industry also uses microorganisms in order to synthesize amino acids and organic solvents. Microbes can also be used in an agricultural application for use as a bio pesticide instead of using dangerous chemicals and or inoculants to help plant proliferation.

Medical application

The microorganisms grow in a liquid media where the population size is controlled in order to yield the greatest amount of product. In this environment nutrient, pH, temperature, and oxygen are controlled also in order to maximize the amount of cells and cause them not to die before the production of the antibiotic of interest.

Food Industry Application

Fermentation

Fermentation is a reaction where sugar can be converted into a gas, alcohols or acids. In this process, once there is enough alcohol and carbon dioxide around in the media the yeast start to die due to the environment becoming toxic to them. Most yeast can tolerate between 10 and 15% alcohol, but there are some strains that can tolerate up to 21% alcohol. Dairy products like cheese and yogurt can also be made through fermentation using microbes. Cheese was produced as a way to preserve the nutrients obtained from milk, through fermentation thus elongating the shelf-life of the product. Microbes are used to convert the lactose sugars into lactic acid through fermentation.

Agriculture application

The demand for agricultural products is constantly increasing due to the need of various fertilizers and pesticides. There are long term effects of the overuse of chemical fertilizers and pesticides. Due to the excessive use of chemical fertilizers and pesticides, the soil becomes infertile and a non-sufficient use for growing crops. For that matter, biofertilizers, bio pesticides and organic farming come to the rescue.

Chemical application

The production of organic solvents like acetone, butanol, and isopropanol through fermentation was one of the first things to be produced by using bacteria, since achieving the necessary chirality of the products is easily achieved by using living systems.

Related Journals of Industrial Microbiology

Journal of Medical Microbiology & Diagnosis, Mycobacterial Diseases, Fermentation Technology, Journal of Food: Microbiology, Safety & Hygiene, Journal of Industrial Microbiology, Journal of Industrial Microbiology and Biotechnology, Journal of Industrial Microbiology, Applied and Industrial Microbiology, Journal of industrial microbiology and biotechnology abbreviation, Journal of applied microbiology, Journal of pure and applied microbiology.