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Short Communication

The Use of Microbes in Biofuel Production

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ABSTRACT

Biofuel is produced from the waste of the living organisms. The commonly produce biofuel is ethanol that is produced from plants. In the ethanol production the main plants used are sugar beet, corn, and sugar cane. This is because they contain larger amounts of sugar which can be easily fermented by the microbes like yeast Saccharomyces cerevisiae.

Keywords: Biofuel; Microbes; Ethanol

INTRODUCTION

The use of biofuel has reduced the impact on the climate when compared to the other fuels. It is studied that these biofuel residues reduce the hydrocarbon emission to a large extent. When it is used instead of diesel reduces the carbon monoxide and sulfur emission by major extent.

The conversion plant materials to the fuels is a very expensive process and there comes some ethical considerations. For the conversion plants must be cultivated in a large acre of land as a result it reduces the land available for food production.

To produce ethanol microbes are being used. It is produced from lignocellulose which is a mixture of cellulose, hemicellulose, and lignin. Cellulase is the enzyme which breaks down the cellulose. Several microbes are being studied by the scientists for the sources of this enzyme in the environment. It is found in the unusual environments like stomach of termites and near the volcanoes.

Near the volcanic pores Sulfulobus solfatarticus an archaeon is found. Scientists are making research by changing their genetic modulation so that they can improve their ability to produce the necessary enzymes.

the fungus that is found everywhere in the soil is Trichoderma reesei. It feeds by secreting cellulase. Genetic modifications were done for the fungus to produce still larger amounts of cellulase and convert straw to glucose. This can be converted to ethanol.

The next microbe is algae. These algae use the photosynthesis method to convert the carbon dioxide to sugar and which they later used for the production of lipids. The scientists by using some small laboratory bioreactors are trying to convert lipids to biodiesel and bioethanol is produced from algal carbohydrates.

Biofuels are converted into two categories they are first generation and second-generation biofuels

First generation biofuels: These biofuels are produced from the sources like sugarcane and corn starch. The sugars are fermented to produce bioethanol which can be directly used in a fuel cell to produce electricity or can be used in place of gasoline.

Second generation biofuels: These biofuels are produced from the agriculture and municipal waste which Is a non-food-based biomass. It generally consists of lignocellulosic biomass which is non-edible and has very low value. Due to some technological issues economic production of second-generation biofuel is not yet achieved.

The disadvantage of the biofuels is the waste from the plants that is inedible. The microbial system to produce biofuel is less wasteful, cheaper and more ethical.

CONCLUSION

Here by I can conclude that the overpopulation, the end of the oils and climate change. With the innovative research like most of these problems can be overcome. Furthermore research is required to produce these solutions on a large scale on an industrial level.

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