VISVESVARAYA TECHNOLOGICAL UNIVERSITY
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PROJECT WORK

"VALUE ADDED UTILIZATION OF CRUDE GLYCEROL"

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ABSTRACT

Because of the increasing pollution problems caused by the petroleum products, there is an urgent need for the identification of a substitute which is natural, safe and economical. The greener substitute is biofuel. In the production of biodiesel, a very large amount of glycerol i.e., 5-10 gallons per 100 gallon of the biodiesel is produced. This crude glycerol is considered as an industrial waste because of the impurities present in them. Hence it is usually discarded or sold to other industries at a very low cost because of its low purity. The purification of the glycerol to be used in cosmetic, food and pharmaceutical industry requires very high temperature, pressure and economical and hence not feasible. The crude glycerol can be used as the substrate for the microbial production of various value added products like succinic acid, propionoic acid and 1,3-propanediol(1,3-PD). The microbial production of 1,3-PD is of great interest because of the various uses it offers in various industries like food and medicine. Various bacterial strains are used for the production of 1,3-PD from crude glycerol but *Citrobacter freundii* is of the strain which efficiently converts it. *Citrobacter freundii* is mildly pathogenic, facultative anaerobic and converts crude glycerol to 1,3-PD faster when compared to other bacterial strains like *Enterobacter, Klebsiella pneumonie* and *Clostridium butirycum*. Silk worm pupae which is considered as waste after the reeling of silk is thrown away but it is a very rich source of oil. Hence we used silk worm pupae as the raw material for the extraction of oil and the byproduct crude glycerol in the production of 1,3-PD using *Citrobacter freundii.*