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Lipid accumulation in oleaginous *Aspergillus* sp. utilizing glycerol – A byproduct of biodiesel biorefinery

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Depletion in the fossil fuel reserves and rapid urbanization are the major reasons behind adoption of renewable energy. In addition, the utilization of fossil fuels leads to a myriad of environmental complications like increased concentration of unburned hydrocarbons, CO and NOx in the ambient air above the threshold level contributing to global warming. These issues have forced the international community to research on biofuels which are sustainable and carbon neutral. In this context, biodiesel is one of the potential biofuels source since it can be produced from sustainable resources, leads to reduction in the harmful emissions, non-toxic and biodegradable in nature. Biodiesel is mainly produced from vegetable oils which have food value and hence cannot be diverted for fuel applications. In this context, oleaginous microbes are an alternative source since they have the natural ability to accumulate more than 20% lipid on dry weight basis (dwb) and their fatty acid composition is similar to that of vegetable oils. Moreover under nitrogen and phosphorous stress conditions, lipid content can be enriched up to 70% on dwb. One of the major advantages of using oleaginous microbes is their ability to simultaneously utilize low cost substrates viz., lignocellulosic biomass (LCB), municipal waste, wastewater from different industries as carbon source along with the accumulation of lipids. Among the potential substrates, glycerol – a byproduct from the biodiesel production refinery is the most promising since its utilization will make the process self-sustaining. In the present study, physico-chemical parameters affecting the lipid accumulation capability of *Aspergillus* sp. viz., concentration of carbon, nitrogen, sulphur and phosphorous source, pH, temperature, effect of heavy metals, incubation time and effect of shaking has been studied. From the single parameter study, maximum lipid accumulation of 3.2 g/L having a lipid content of 45% (w/w) was obtained.

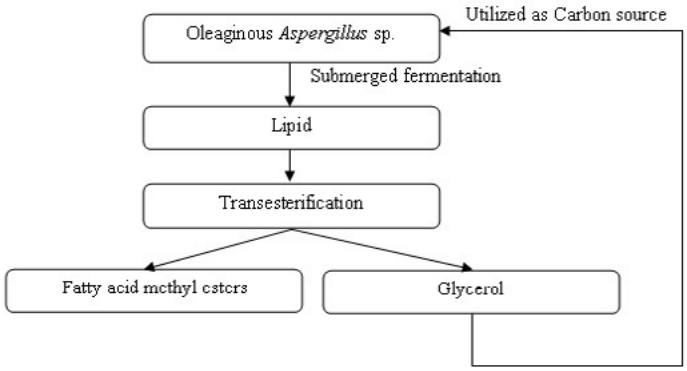

Figure 1: Biodiesel production utilising glycerol – a byproduct of the biodiesel biorefinery

Biography

G Lohit K Srinivas is a PhD Scholar working under the supervision of Prof. Rintu Banerjee. His area of research is biodiesel production utilizing oleaginous microbes.

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