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Screening And Characterization of Oleaginous Fungi from Starch Processing Wastewater for Single Cell Oil Production

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The fossil fuels are depleting day by day, there is a need to find out an alternative fuel to fulfill the energy demand of the world. Biodiesel is the one of the prominent renewable energy resources and it emits fewer pollutants to atmosphere. Of the biodiesel production methods, microbial oil production from low cost raw materials is the current topic of interest. In the present investigation sago processing wastewater was targeted to produce microbial lipids. Sago processing wastewater had a high concentration of starch (5g.l-1), COD (10,567 mg. L-1), BOD and other nutrients and pH of 5.4. Attempt has been made to isolate oleaginous fungi from soil and wastewater in and around the processing unit. A total of 50 isolates were obtained and screened primarily for amylase secretion, among the 50 isolates 19 were found to be amylase positive based on plate screening and their hydrolytic capacity. All the nineteen isolates were characterized on starch containing lipid production medium with C:N ratio of 30:1 and cultivated for seven days. Biomass was estimated for all the 19 isolates and maximum biomass of above 10 g.l-1 was observed for seven isolates (SPW1, SPW4, SPW17, SPW28, SPW30, SPW31, SPW32 and SPW42) with a maximum biomass observed (15 g.l-1) for isolate SPW4. Rest of the isolates had biomass concentration of less than 10 g.l-1. Results on lipid yield of isolates showed that lipid yield was in range from 1.3 to of 4.3 g.l-1, lipid yield of above 3 g.l-1 was observed for four isolates SPW1, SPW4, SPW31 and SPW 42. Almost all the isolates consumed the starch considerably the consumption rate of above 20 g.l-1 was observed for all isolates with the maximum consumption being 29.6 g.l-1 was observed for isolate SPW42. In addition to lipid production, the isolates also had considerable amylase activity; maximum amylase of 34.6 U.mL-1 was produced by isolate SPW31. Identification of potential oleaginous fungi SPW31 by 18srDNA approach revealed that SPW31 showed 100 % similarity with *Aspergillus terreus*.
Keywords: Microbial oil, Biodiesel, Sago processing waste water.