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PRODUCTION AND STABILITY OF MYCOFLOCCULANTS FROM LENTINUS SQUARROSULUS RWF5 AND SIMPLICILLIUM OBCLAVATUM RWF6 FOR REDUCTION OF WATER TURBIDITY

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Abstract

The production and stability of two novel myco-flocculants produced by river water fungus (RWF) were investigated. Screening tests were conducted to find suitable nutrients, pH, nutrient concentration, inoculum dose, and stability for two mycoflocculants *L. squarrosulus* (RWF5) and *S. obclavatum* (RWF6). The strains showed good flocculating activity in reducing turbidity of kaolin suspension while malt extract was used as nutrient source. Supernatants of RWF5 and RWF6 were able to reduce turbidity from 900 +/- 10 NTU to 46 NTU (95%) and 195 NTU (78%), respectively. In order to enhance the production, optimization of cultivation conditions were studied using a one-factor-at-a-time (OFAT) method. *L. squarrosulus* (RWF5) reduced 96% of turbidity at optimum conditions, comprising of 0.1% (w/v) malt extract, 3% (v/v) inoculum dose, and initial pH 7.0 for 6 days. The results of the compatible mixed culture showed good flocculation activity at 88% compared to a single culture of *S. obclavatum* at 78%. On the other hand, *L. squarrosulus* showed better turbidity reduction in the single culture rather than the mixed culture. The stability of *L. squarrosulus* and *S. obclavatum* supernatants showed excellent turbidity reduction over a wide pH range of 4-8 with the maximal flocculation rate of 96% and 90%, respectively, at pH 7.0. They also exhibited high turbidity removal ability in a temperature range of 4 C-degrees - 55 C-degrees for 24h with a maximum turbidity removal rate of 96% (RW5) and 87% (RW6) at 25 C-degrees. Time stability of the *L. squarrosulus* supernatant showed good turbidity removal potential at above 90% at room temperature (28 +/- 2 C-degrees) and 85% at low temperature (4 C-degrees) for 12 days. The high flocculating rate of the myco-flocculants and their good stability under wide range of temperature indicated their potentiality as biodegradable flocculants for water and wastewater treatment industry.

Keywords

Author Keywords: flocculation; jar test; *Lentinus squarrosulu*; mixed culture; *Simplicillium obclavatu*; stability; turbidity

KeyWords Plus: WASTE-WATER; MOLECULAR-IDENTIFICATION; FLOCCULATION PROPERTIES; BACILLUS-LICHENIFORMIS; BIOFLOCCULANT; SLUDGE; STRAINS; BIOCONVERSION; POTENTIALITY; PERFORMANCE

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