*Journal of Fungi* • *Open Access* • Volume 8, Issue 2 • February 2022 • Article number 192

**Document type**
Article • *Gold Open Access* • *Green Open Access*

**Source type**
Journal

**ISSN**
2309608X

**DOI**
10.3390/jof8020192

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# Novel Myco-Coagulant Produced by Lentinus squarrosulus for Removal of Water Turbidity: Fungal Identification and Flocculant Characterization

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Abstract

Author keywords

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Sustainable Development Goals 2021

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## Abstract

Several river water fungal strains (RWF-1 to RWF-6) were isolated to investigate the potential of having coagulant properties from the metabolites produced by the fungus. The myco-coagulant produced from the liquid-state process was characterized and tested for flocculation of kaolin water. Molecular identification of the fungal strain isolated from river water and characterization of the myco-coagulant produced by the strain are presented in this paper. The genomic DNA of the fungal 18S ribosomal

ribonucleic-acid (rRNA) and 28S rRNA genes were used and the species was identified as Lentinus squarrosulus strain 7-4-2 RWF-5. The characterization of myco-coagulant by Fourier-transform infrared spectroscopy (FTIR) showed that hydroxyl, carbonyl, amide and amine groups as principal functional groups were present in the new myco-coagulant. The mean zeta potential value of the myco-coagulant was −7.0 mV while the kaolin solution was −25.2 mV. Chemical analyses of the extracellular myco-coagulant revealed that it contained total sugar (5.17 g/L), total carbohy-drate (237 mg/L), protein (295.4 mg/L), glucosamine (1.152 mg/L); and exhibited cellulase activity (20 units/L) and laccase activity (6.22 units/L). Elemental analyses of C, H, O, N and S showed that the weight fractions of each element in the myco-coagulant was 40.9, 6.0, 49.8, 1.7 and 1.4%, respectively. The myco-coagulant showed 97% flocculation activity at a dose of 1.8 mg/L, indicating good flocculation performance compared to that of polyaluminum chloride (PAC). The present work revealed that the fungal strain, L. squarrosulus 7-4-2 RWF-5 is able to produce cationic bio-coagulant. The flocculation mechanism of the novel myco-coagulant was a combination of polymer bridging and charge neutralization. 

Author keywords

Flocculation mechanism; Lentinus squarrosulus; Myco-coagulant; Turbidity; Water treatment

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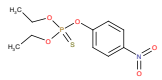

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