



Optimization of algicidal activity of indigenous strain *Schizophyllum commune* 104UTHM against *Microcystis aeruginosa* in freshwater using response surface methodology

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Received 22 February 2019; Accepted 15 August 2019

ABSTRACT

The present study aims to optimize the algicidal activity of *Schizophyllum commune* against *Microcystis aeruginosa* in the freshwater through the bio-flocculation process. Four independent factors including fungal inoculum size, x_1 (10–100 mL [10^6 CFU mL⁻¹]), pH, x_2 (4–9), mixing rate, x_3 (50–150 rpm) and hydraulic retention time, x_4 (30–180 min) were optimized using response surface methodology. The effect of algicidal activity of *S. commune* 104UTHM on *M. aeruginosa* cell morphology was determined using scanning electron microscope. The optimal inactivation rate was 50.32 vs. 54.63% in Chl-a, (y_1), for actual and predicted percentage, respectively, achieved with 100 mL of the fungus inoculum size, pH 6, with 125 rpm of the mixing rate and within 135 min of HRT with 72% of the coefficient (R^2). A significant coefficient of the inactivation rate was recorded at 93.60% of confidence level. The algicidal activity of *S. commune* 104UTHM led to damage of *M. aeruginosa* cell and changes the cell shape.

Keywords: Response surface methodology; Bio-flocculation; Mechanism; Environmental factors

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