

Piyarat Wattanasup 2006: Decolorization of Synthetic Reactive Dye Wastewater Using Basidiomycete Fungi in Submerged Microfilter Bioreactor. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Mr. Monthon Thanuttamawong, Ph.D. 159 pages.

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The purpose of this study was to investigate the decolorizing efficiency of the reactive blue A 13 dye in synthetic wastewater. The experiment were carried out using Basidiomycete fungi in a pilot-scale Submerged Membrane Bioreactor (SMBR) with 20  $\mu\text{m}$  microfilter pore size under control conditions at pH 4.5-5.0 and DO 2 mg/l. Three different operational conditions were experimented. In the first experiment, batch reactor was operated; the hydraulic retention time (HRT) was set at 4 and 8 hours; the initial Mix Liquor Suspended Solid (MLSS) was provided at 350 mg/l and F/M ratio values were designed at 1.5 and 4.6 kgCOD/kgMLSS.d. From the results, MLSS increased to 515 and 545 mg/l, COD removal efficiencies were 48.4 and 67.7% and color removal efficiencies were 95.6 and 97.4%, respectively. In the second experiment, fungi kinetic in Continuous Stirred Tank Reactor (CSTR) submerged microfilter was studied; HRT and MLSS were set at 8 hours and 500 mg/l respectively and F/M ratio values were varied at 1.2, 2.4 and 3.6 kg-COD/kgMLSS.d. The results showed that the average COD removal efficiencies were 85.3, 91.6 and 86.3% and the average color removal efficiencies were 43.0, 53.5 and 64.0 respectively. From the results, the kinetic coefficient namely  $k$ ,  $K_s$ ,  $Y$ ,  $K_d$  and  $\mu_m$  were  $4.61 \text{ day}^{-1}$ ,  $40.49 \text{ mg-COD/l}$ ,  $1.08 \text{ mg-MLSS/mg-COD}$ ,  $1.08 \text{ day}^{-1}$  and  $4.97 \text{ day}^{-1}$ , respectively. In the third experiment, the decolorizing efficiencies of synthesis wastewater using sequencing batch reactor (SBR) were studied; HRT and MLSS were set at 4 hours and 500 mg/l respectively; F/M ratio values were varied at 1.2, 2.4, and 3.6 kg-COD/kgMLSS.d, respectively. The results showed that the average COD removal efficiencies were 90.6, 85.7 and 87.5%, respectively. The average color removal efficiencies were 47.4, 59.5, and 61.0 %.

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