

# Removal of Indigo Blue Dye using *Yakinori* (*Pyropia* sp.) from Wastewater

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**Abstract**—Dyes are toxic and dangerous to aquatic living organisms. They decrease light penetration and photosynthesis, which causes problems to aquatic groups. As synthetic dyes are usually designed to be chemically and thermally stable, dye wastewater needs to be disposed of accordingly and should not be discharged directly into bodies of water. In this study, batch sorption experiments were carried out for the removal of indigo blue dye from synthetic wastewater using *Yakinori* (*Pyropia* sp.) The equilibrium was attained at 20 minutes, beyond this no significant removal was noticed. The values of different process parameters were varied as pH (2.0-8.0), initial concentration of indigo blue dye (100-300 mg/L), biosorbent dosage (1.0-3.0 g/L) in order to study the effect of these parameters on removal efficiency of indigo blue dye using *Yakinori* (*Pyropia* sp.) All the experiments were performed at room temperature and 150 rpm stirring speed. The optimum values of these parameters were found as pH (8.0), initial concentration of indigo blue dye (100 mg/L), biosorbent dosage (3.0 g/L) at which maximum removal efficiency of 98 % has been achieved. Six isotherm models. The experimental data were fitted to four isotherm models (Langmuir, Freundlich, Redlich Peterson, and Fritz) and two kinetic models (Pseudo first order and pseudo second order). The equilibrium data were followed the Langmuir isotherm model. Kinetic studies showed that the biosorption process follows first order rate kinetics which shows the physisorption. The results of this study confirmed that *Yakinori* (*Pyropia* sp.) can be successfully utilized as a low-cost adsorbent for removal of indigo blue dye in order to treat the industrial wastewater.

**Keywords:** *Yakinori* (*Pyropia* sp.), indigo blue, kinetics, equilibrium.