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Use of Placket Burman design in optimizing the process parameters for decolorization of VAT blue 4 by the fungus Lividopora vincta isolated from textile industry effluents.

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The textile industry, a major user and polluter of water, generates wastewater laden with diverse chemical contaminants such as dyes, organic substances, salts, and heavy metals. This makes it one of several high-water-consumption sectors, alongside industries like paper, plastics, food, and leather. Decolorization of Vat blue 4 has been taken up in the current investigation. Vat blue is commonly used for dyeing cotton and other cellulose fibers. In this study, Lividopora vincta was isolated from textile industry effluents of Bangalore and identified using ITS gene based molecular method. Using one-factor-at-a-time approach, the optimized conditions for decolorization of VAT blue 4 using Lividopora vincta were a pH of 5, a temperature of 30℃, a dye concentration of 300 mg/L, and 100 mg/L each of maltose and Potassium nitrate and an inoculum concentration of 3% v/v. The factors significant in decolorization were further found out using Placket-Burman design with the software Design expert. Maltose, temperature and dye concentration were found to be the significant factors in decolorization of VAT blue 4 using Lividopora vincta. Further studies with response surface methodology would be carried out using these significant factors.
Key words: Optimization, Decolorization, VAT Blue 4, Lividopora vincta, Placket-Burman Design

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