

## Exploration of Artificial Neural Network and Response Surface Methodology in Removal of Industrial Effluents

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**Abstract :** Toxic dyes found in industrial effluent must be treated before being disposed of due to their harmful impact on human health and aquatic life. Thus, *Musa acuminata* (Banana Leaves) was employed in the role of a biosorbent in this work to get rid of methylene blue derived from a synthetic solution. The effects of five process parameters, such as temperature, pH, biosorbent dosage, and initial methylene blue concentration, using a central composite design (CCD), and the percentage of dye clearance were investigated. The response was modelled using a quadratic model based on the CCD. The analysis of variance revealed the most influential element on experimental design response (ANOVA). The temperature of 44.30C, pH of 7.1, biosorbent dose of 0.3 g, starting methylene blue concentration of 48.4 mg/L, and 84.26 percent dye removal were the best conditions for *Musa acuminata* (Banana leave powder). At these ideal conditions, the experimental percentage of biosorption was 76.93. The link between the estimated results of the developed ANN model and the experimental results defined the success of ANN modeling. As a result, the study's experimental results were found to be quite close to the model's predicted outcomes.

**Keywords :** *Musa acuminata*, central composite design, methylene blue, artificial neural network

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