



## Isolation, Characterization and Optimization of Bacteria for Eco-friendly Degradation of Azo-dyes

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Received : November 2017

Accepted : March 2018

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**Abstract:** Azo dyes are organic compounds bearing the functional group  $R^1N=N^R2$ . They are pervasively used to treat textiles, leather articles, and some foods. In this work the bacteria with the potential to degrade azo dyes were screened. For this study, the azo dyes Methylene blue and Eosin Yellow were used as a carbon source in MSM (Minimal Salt Medium). *Micrococcus sp.*, *Bacillus sp.*, *Streptococcus sp.*, *Staphylococcus sp.* and *Pseudomonas sp.* were the most potent strains among all the 17 bacterial strains isolated and subjected to degradation of the dye. The degradation of the dye was characterized by change in colour visually and by UV-Vis Spectroscopy. The decolourization activity of the bacterial isolates was also calculated. Seven of the most efficient

bacterial strains (DL1, DL2, DL3, DL5, DS1, DS2, and DS3) were selected which had the highest decolourization activity of Methylene Blue (50mg/l, 75mg/l and 100mg/l), i.e., between 72-95% and Eosin yellow (100mg/l and 200mg/l). The bacterial activity was then optimized at different physical conditions (pH and temperature) and it was found that most of the bacterial isolates had optimal growth at temperature 55°C and alkaline pH of 10.5. So, the main aim of the present study was to isolate and characterize efficient bacterial strains which show the remarkable ability to decolorize/degrade various azo dyes used in various disciplines. Since the bacterial isolates originated from the dye contaminated waste water of local industry, they can easily adapt to the prevailing local environment. Therefore, such bacteria can be used to develop an effective biological treatment system for the wastewaters contaminated with azo dyes.

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**Keywords:** Azo dyes, bacteria, decolourization, degradation, Methylene Blue, Eosin Yellow, UV-Vis Spectroscopy.