

# Assessment of the Potential of A Halo-Alkaliphilic Bacterium Immobilized on Loofa Matrix in Removal of Methyl Orange Dye

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## ABSTRACT

Textile wastewater is highly loaded with textile dyes and other toxic chemicals thus adding to harsh nature of the effluent. It is a matter of environmental concern if the textile effluent is discharged untreated into receiving waters since the recalcitrant organic compounds will lead to ecosystem imbalance upon interaction with various environmental matrices. In the current study, a halo-alkaliphilic bacterium, *Nesterenkonia lacusekhoensis* EMLA3 was immobilized on loofa for the treatment of Methyl Orange (MO) as model dye. Effect of various parameters like attachment time (48 – 192h), dye concentration (20 – 120 mg/L) and temperature (30°C - 44°C) was studied on dye removal efficiency of the immobilized bacterium. Upon investigation, it was observed that physically localized bacterium was able to remove >90% dye for 20 and 50 mg/L dye concentration at 37°C and alkaline pH. Further, to investigate the potential of the immobilized bacterium at industrial scale, treatment of real textile wastewater was also attempted by using the immobilized bacterial cells. The present study shows that immobilized haloalkaliphilic bacterial cells might be used as a good candidate for the bioremediation of dye-rich alkaline wastewaters.

**Keywords:** Immobilization; Halo-alkaliphilic, Decolorization, Bioremediation, Wastewater Treatment

## How to Cite

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