

Screening of Potential Bacteria from Soil Sample for Methylene Blue Dye Degradation using 16S rRNA sequencing

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Abstract:

Methylene blue (MB) is a water soluble dye, carcinogenic and toxic. The removal of MB from water is the high concern, thus various methods have been developed including biological methods. However, the availability of abundant microorganisms proposes to identify the potential microorganism for degradation of MB. In this study, we aims to screen the bacteria from the samples collected from textile dye enriched soil. Twenty one soil bacteria were isolated and examined for their efficacy in degradation of MB. The potential bacteria was characterized and identified using 16S rRNA sequence technique, i.e. *Bacillus Cereus*. One factor at a time approach has employed to optimize the process parameters for enhancing the degradation of MB using *Bacillus Cereus*. The optimal process parameters for pH, temperature, degradation time, and shaker speed were found to be 8, 37°C, 24 h and 130 rpm respectively. The maximum degradation of 97.7% was achieved at the optimized conditions. It was confirmed that *Bacillus Cereus* is a potential microorganism for MB dye degradation. The results of this study would contribute for further studies in scale up the process using bioreactors.

Keyword: Decolourization, Methylene Blue, *Bacillus Cereus*, Textile Dye