Bioremediation of Textile Effluent by Using Indigenous Bacteria

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ABSTRACT

In textile industry the consumption of drinking water in large quantity and then discharge of used water in form of colored effluent is an alarming condition. The discharge effluent from textile industries causes the serious threat to the environment. The current study is design to treat the toxic colored effluent by using different indigenous bacteria in an environmental friendly manner.

Total forty bacterial strains were isolated from effluent and dye contaminated soil samples using MSM (Minimal Salt) medium. After wards, the isolates were exploited for their effluent degradation activity by employing agar well diffusion and calorimetric methods.

Six out of forty bacterial cultures presented maximum degradation efficiency against colored effluent. This suggests that these bacteria release extracellular enzymes which showed degradation ability. However, this research is beneficial to explore biodegradation potential of bacteria so that they can be used in the treatment of different waste effluents release from textile dyeing sector.

Keywords: Bioremediation, effluent, indigenous bacteria

INTRODUCTION

The trend of urbanization and industrialization has granted the world with a lot of applicable and remarkable benefits. Along with the various advantages it also brings some issues and the revolution of industry comes with environmental problems (Saravanan et al.,2021; Khan et al., 2020). Like other industries, development in textile industry has brought the contamination of soil and water with effluent dyes, therefore treatment of dye-contaminated wastewater discharged from the textile and other dye-stuff industries is necessary to prevent contamination of soil surface and ground water (Kapoor et al., 2021; Rakkan et al., 2021). The cost effective biological strategy is the need of the time to complete mineralization of organic pollutants (Khan et al., 2020).

OBJECTIVE

1. To isolate the indigenous bacteria from the effluent.
2. To screen the isolated bacteria for their effluent degradation potential.
3. To optimize the different parameters for their effluent degradation potential.

METHOODOLOGY

Indigenous effluent degrading bacteria were isolated from different sources like discharged effluent and soil samples. Isolates were identified by using microbiological and biochemical tests.

The effluent degradation potential of identified isolates was confirmed by calorimetric analysis. Different parameters (pH, Incubation time, temperature) were optimized.

RESULTS

In present study the total forty bacteria was isolated and among them the six potential bacterial cultures were showed maximum decolorization for effluent (Reactive black-5). The dye effluent decolorizing isolates were showed their activity in 72hours of incubation and at pH 7-8, temprature30-40C. These isolates could effectively use as an alternative to physical and chemical processes for effluent treatment.

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