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## REMEDIATION OF CI DIRECT BLUE 201 TEXTILE DYE: GREEN SOLUTION THROUGH NOVEL BACTERIA ISOLATED FROM TEXTILE WASTE WATER EFFLUENTS, SRI LANKA

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### ABSTRACT

Textile industry is one of the industries which extensively use various types of dyes and generate huge amount of wastewaters. Present study was carried out on the decolorization of CI Direct Blue 201 Textile Dye by bacteria isolated from textile wastewater effluent sites. Overnight grown bacterial cultures were starved in sterile saline water (0.01 M sodium chloride). Turbidity of the bacteria cell suspensions were equalized ( $A_{590} = 0.35$ ) and introduced 5% (v/v) of bacterial suspension into filter sterile dye solutions at final concentration of  $50 \text{ mg l}^{-1}$  and incubated at  $28 \text{ }^{\circ}\text{C} \pm 1 \text{ }^{\circ}\text{C}$  under static conditions. Sample aliquot (3 ml) was removed daily and standard spectrophotometric method was used to determine the decolorization percentage. The effect of temperature, carbon and nitrogen sources, shaking and static conditions, initial dye concentration were studied with an aim to determine the optimal condition required for maximum decolorization. Control experiment was carried out in the same manner without addition of bacteria. Among the 157 bacterial isolates, three bacterial isolates showed almost complete decolorization ability within 72 h of incubation. 16S rRNA sequence analysis identified three bacterial isolates as *Micrococcus* sp, *Alcaligenes* sp. and *Staphylococcus* sp. CI Direct Blue 201 textile dye ( $50 \text{ mg l}^{-1}$ ) removal of isolated strains was detected as  $97 \% \pm 1$ ,  $95 \% \pm 1$  and  $92 \% \pm 1$  respectively while control remaining constant. It was found that the decolorization was effective for the tested bacterial isolates at  $32 \text{ }^{\circ}\text{C}$ , under static conditions with the supplement of yeast and peptone as sole carbon and nitrogen sources. Thus, present study is a green light for future biotechnological approach for the treatment of colorful nuisance textile wastewater effluents in environmental friendly aspects.

**Keywords:** Decolorization, Textile dyes, *Micrococcus* sp, *Alcaligenes* sp., *Staphylococcus* sp