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ISOLATION OF TEXTILE DYE DECOLORIZING BACTERIA FROM ENVIRONMENTAL SAMPLES

M.S. Ekanayake and P.M. Manage*

Centre for Water Quality and Algae Research, Department of Zoology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka.

Textile dyes have highly stable structures, toxic properties and are resistant to the degradation processes in the environment. The ability of microorganisms to decolorize a wide variety of chemical compounds have been identified and exploited in various biotreatment processes. The present study was carried out to study decolorization of CI Direct Blue 201 textile dye by bacteria which were isolated from wastewater collected near textile factories at Avissawella and Pugoda, Sri Lanka. Wastewater samples were enriched under static conditions by spiking the dye at a final concentration of 50 mg L^{-1} for 14 days. Bacteria were isolated using the Standard Pour Plate Method. The decolorization ability of bacteria was determined by introducing overnight starved equalized bacteria suspensions into filter sterilized dye solutions at a final concentration of 75 mg L^{-1}. The flasks were incubated at (28 ± 1) °C under static conditions. Sub sample aliquots each of 3 mL were removed at 2 day intervals for a period of 14 days. Standard spectrophotometric method was used to determine the decolorization percentage. Among 35 bacteria isolates, five strains showed remarkable decolorization of the dye. Bacteria were tentatively identified by biochemical tests and the strains belonged to genera *Pseudomonas*, *Bacillus*, and *Micrococcus*. Decolorization percentage were detected as 58.15 (± 0.92)%, 55.02 (± 0.70)%, 54.73 (± 1.99)%, 51.86 (± 0.49)%, and 51.55 (± 0.74)% for *Pseudomonas* sp. 2, *Bacillus* sp. 2, *Pseudomonas* sp. 1, *Micrococcus* sp., and *Bacillus* sp. 1, respectively. The highest dye decolorization percentage (58.15%) was recorded when *Pseudomonas* sp. 2 cell density was increased from 8×10^3 CFU mL^{-1} to 2.8×10^4 CFU mL^{-1}. Other bacteria cell densities remained low and low decolorization percentages were detected. Photolysis experiments revealed that decolorization of CI Direct Blue 201 dye was not affected by sunlight. Thus, isolated bacteria can be used as better candidates for removal of CI Direct Blue 201 textile dye as a green remedial solution.

Keywords: Decolorization, CI Direct Blue 201, *Pseudomonas* sp., *Bacillus* sp., *Micrococcus* sp.

*pathmalalmanage@gmail.com