



REMOVAL OF TEXTILE DYE (CI DIRECT BLUE 201) BY FUNGI AS A GREEN ENVIRONMENTAL SOLUTION

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More than 10,000 various types of dyes are manufactured annually for various industries including textile, cosmetic, plastic, and printing industries. Among these industries, textile industry accounts for 2/3 of world total synthetic dye production. Textile dyes are normally designed to be stable to light, chemicals and microbial degradation. Therefore, untreated or partially treated textile dye effluents which are finally end up in natural waters caused environmental and health impacts. Biological treatments have achieved growing concern as it has greater efficiency and cost effective than the conventional treatment methods. Present study was focused on isolation of CI Direct Blue 201 textile dye decolorizing fungal species from textile dye effluents in Sri Lanka. Wastewater and soil samples were enriched in static conditions by spiking dye at final concentration of 50 mg L⁻¹ for 14 days. Fungal species were isolated from standard spread plate method using Potato Dextrose Agar (PDA) medium. Dye decolorization ability of isolated fungal species was performed in two phases; solid media experiment and liquid media experiment. Among 27 isolated fungal species, five species showed remarkable decolorization. Fungal species; Sp.7, Sp.9, Sp.14, Sp.18, and Sp.23 showed 49.23 ± 3.67%, 96.93 ± 3.91%, 75.08 ± 2.82%, 95.93 ± 1.75%, 66.63 ± 3.66% of decolorization respectively after 14 days of incubation. The FTIR spectrum analysis revealed that the peak area relevant to the C-H groups stretching (2850-3000 cm⁻¹) decrease with incubation. The Infra-Red absorption wavelength at 2362.65 cm⁻¹ relevant to the changes of dye structure with the incubation. Thus FTIR and biosorption test confirmed that the decolorization was not based on surface adsorption but the degradation process. Hence, isolated fungal species are potential candidates for future biotechnological applications, especially to treat wastewater which having textile dyes.

Keywords: *Decolorization, CI Direct Blue 201, Fungi, Textile dye*