

(169)

Effectiveness of *Aspergillus aculeatus* on Decolorisation of Mixture of Two Different Textile Dye Classes**Ekanayake M., Udayanga D., Jayawardana D.T., Manage P.M.****University of Sri Jayewardenepura, Sri Lanka***pathmalal@sjp.ac.lk***Abstract**

Textile dye effluents are one of the major type of water pollutants that release to the environment in huge loads. Textile dyes are resistant to natural degradation process and persist in the environment for a long time. Use of conventional chemical and physical treatment methods to textile dye effluents are highly expensive with having several drawbacks, thus not employed frequently. Therefore, the present study was aimed to evaluate the effectiveness of the isolated fungus; *Aspergillus aculeatus* for decolorisation of mixture of CI Direct Blue 201 (direct dye) and Cibacron Blue FR (reactive dye) dye classes. Four discs (5 mm diameter) of pre grown *A. aculeatus* fungal mycelia, which cut from the edges were inoculated into 250 mL of dye mixture at final concentration of 50 ppm (1:1 w/w), following enrichment with Potato Dextrose Broth (PDB) incubated in 100 rpm at 280° C for 7 days. Decolorisation of the dye mixture was evaluated by measuring the changes of the absorbance using UV-Visible spectrophotometer. Toxicity of the decolorized dye solutions was evaluated using the seed germination assay for *Oryza sativa* and *Vigna radiata* seeds. *A. aculeatus* showed 98%±2 decolorisation within 72h of incubation and decolorisation was highly suppressed at static conditions (46%±1 at 72h of incubation). Decolorisation was well effective up to five cycles at repeated addition of textile dyes to same initial fungal biomass. It was found that dead fungal biomass absorbed only 12%±2 of dye mixture at the same incubation period, suggesting that decolorisation take place with having live biomass of *A. aculeatus* confirming biotransformation of the dyes by the organism rather than adsorption. Seed germination assay shown that decolorised dye mixture was not toxic (100% germination for both seed species) compared to the original dye mixture (16.2±2.08 germination in *O. sativa* and 10.0±3.3% germination in *V. radiata*). Thus, the present study revealed that the fungus *A. aculeatus* is a potential candidate to use as a biological agent to remove textile dyes mentioned as a green approach to treat textile dye contained effluent. Further studies for other dyes are being evaluated.

Keywords: Decolorisation, *Aspergillus aculeatus*, Textile dye, CI Direct Blue 201, Cibacron Blue FR