

## EFFECT OF INITIAL DYE CONCENTRATION ON THE DECOLORIZATION OF METHYL RED AS A MODEL FOR SYNTHETIC AZO DYES BY ENDOPHYTIC FUNGUS ISOLATES

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### Structured Abstract

**Background:** Azo dyes are resistance to degradation and cause irreversible environmental harm since their structure contain naphthalene and benzene rings and double-bonded nitrogen atoms (-N=N-). Although azo dyes are categorized as dangerous and mutagenic dyes, the use and manufacture of azo dyes continue until now because of their low cost and other appealing qualities. Exposure to azo dye from dye contaminated water can lead to various health issues. One of the most concerning effects is the potential for skin diseases and dermatological reactions. It can also lead to gastrointestinal disorders. In more severe cases, the accumulation of toxins can result in chronic conditions like liver damage or kidney failure.

**Methods:** The endophytic fungus provided by the faculty was maintained in potato dextrose agar for 3 to 4 days with incubation temperature of 30°C prior to use as inoculum. Fungal plug mycelium sample will be added to 100mL of Potato dextrose broth to start the fermentation process for the biomass production of fungal endophytic. The biomass recovery will be carried out by filtering the biomass. The filtered biomass sample was added to the methyl red solution to start degradation process. The parameters including initial concentration of methyl red were varied for optimum decolorization. The percentage of decolorization rate of the dye was analyzed using a UV spectrophotometer.

**Results:** This study provides evidence that endophytic fungi PD4 can be used to reduce the environmental pollution caused by azo dyes. The breakdown and decolorization of azo dyes are mostly caused by oxidative and nonspecific ligninolytic enzymes like laccase. However, increasing the concentration of methyl red can affect the efficiency of decolorization process. It was evident that the decolorization efficiency declined when initial dye concentration increased.

**Conclusion:** In conclusion, the findings of this study indicated that endophytic fungi PD4 can be used to reduce the environmental pollution caused by azo dyes. Methyl red dye is one of the azo dye group that was used in this study. The rate of dye decolorization activity increase as the times for fermentation process increased. Due to the increased concentration of methyl red dye in the sample, the decolorization efficiency decreases.

**Keywords:** Azo Dyes, Endophytic Fungus, Methyl Red, Decolorization.

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