



Impact of Microbially Treated Dye Wastewater on Growth of Pea Plant

Humaira Kanwal¹ Azeem Khalid²

¹M.Phil. Environmental Science PMAS-Arid Agriculture University Rawalpindi Pakistan

²Associate Professor, PMAS-Arid Agriculture University Rawalpindi Pakistan

Abstract

Textile industry is known to discharge a significant amount of azo dyes in effluents which pollutes water and soil environment, and consequently may affect plant growth. Such wastewater must be treated prior to its discharge into wastewater stream. In this research work, azo dye contaminated water was treated with dye-degrading bacteria strains (*Psychrobacter alimentarius* KS23 and *Staphylococcus equorum* KS26) and its impact was studied on plant growth under controlled conditions. Pea (*Pisum sativum*) plant was used as a test crop. An attached growth sequencing batch reactor with the amendment of three different cosubstrates was used for bacterial treatment of 200mg/L concentration of Reactive Black-5 azo dye and pre-isolated bacterial strains capable of degrading azo dyes was used as an inoculum. Upto 94% color removal was observed with KS23 and KS26 in the presence of mineral salts including yeast extract or yeast extract only. Treated and untreated dye solution (control) was applied for about two weeks. Results revealed positive impact of treated azo dye with different cosubstrates and pre-isolated strains on shoot and root length and biomass in comparison to control. This study suggests that textile industry wastewater can be used for irrigation purposes after the amendment of mixed liquid suspended solids (sewage sludge) and co-substrates to achieve better biomass, but health risks associated with consuming such wastewater irrigated plants are still unknown.

Keywords: Wastewater; sequencing batch reactor; textile effluent; Azo dye.