Abstract

The textile industry contributes considerably to global wastewater. The textile sector is very important in Pakistan, have significant impact as it provides more than 9% of the country's GDP and boosting the economy by 46%. Methyl orange and Eriochrome black dye are a common type of dye in the textile industry, with a large yearly manufacturing volume. Because of their occurrence and persistence in the ecosystem. Their poisonous and lasting properties have a negative impact on the ecology. Isolation of azo dye resistant bacterial strains were isolated from the industrial drain. Wastewater sample was prepared synthetically. Four different plants E. crassipes, P. stratiotes, A. filiculoides, and H. verticillate were used in different treatment combinations: vegetations, vegetation + bacteria and bacteria. Physio-chemical and bio-chemical parameters has been assessed along with azo dye degradation. The vegetation + bacteria treatment combination showed best results as compared to other two treatment combinations. The highest degradation 71% was achieved b vegetation + bacteria along with 116 mg/L COD, 63 mg/L BOD, 2118 mg/L TDS, 7.3 pH, 0.302 g fresh weight, 0.023 g dry weight, 7.26cm shoot length, 5.02 cm root length, 0.24 mg/L chlorophyll a, 1.13 mg/L chlorophyll b, 1.03 µmol/g Malondialdehyde and 8.02 µg/g protein content. Based on the information given, these bacterial strainsare highly capable of degrading both methyl orange and eriochrome black dyes, which arewidely found in textile industry effluents. The plant microbe interaction can be used for azo dye degradation. Also, economic sustainability, the management of production costs, and the careful consideration of the favorable properties of plant-microbe interactions are crucial factors in ensuring the success of any environmental remediation.