ABSTRACT

The revolution in industrialization and increased urbanization has led to the emitting of untreated wastes. Textile industries play a havoc role in the natural aquatic ecosystem. The recalcitrant dispersed dyes found in textile wastewater possess intense coloring potential and synthesize carcinogenic and mutagenic aromatic amines in freshwater. Textile dyes contain aromatic rings in their complex structures and are resistant to degradation. Bioremediation is a phenomenon that is eco-friendly and cost-effective which completely mineralized the toxic dyes into non-toxic substances. In the present study, TH-11 bacteria isolated from industrial wastewater harnessed its potential for the degradation of disperse black-30 dye. Molecular characterization of the bacterial isolate was done by using the 16S rRNA gene. To attain this, the 16S rRNA gene was amplified first and then sequenced by using 936F and 1392R universal primers. TH-11 shows optimum degradation of DB-30 at 100 ppm concentration within 24 hrs. An increase in dye concentration and temperature brings down the degradation potential of bacterial isolate. UV visible spectrophotometry confirmed dye degradation with a disappearance of peak dye in treated sample. Similarly, FTIR analysis showed the breakdown of azo bond and formation of new groups/bonds in bacteria treated samples.

Keywords: Bioremediation, Mineralization, Wastewater, Disperse dyes, Aromatic amines.