ABSTRACT

Antibiotic contamination in the aquatic environment is a global concern. Antibiotics have been considered as emerging pollutants owing to their indiscriminate usage, continual input and persistence in different matrices of environment. Growing levels of antibiotics in wastewater due to anthropogenic sources such as veterinary and pharmaceutical applications are alarming. The severe threat is due to frequent consumption of antibiotics leading to development of antibiotic resistance. Despite of other advanced methods, biodegradation is the environment effective method in the removal of antibiotics. In this study, we investigated the biodegradation of cephalosporin antibiotic with ceftriaxone (CEF) as a model compound. A total of 30 wastewater samples were collected from Kasur and Lahore city to further investigate about resistant microbes in antibiotics. The results showed that degradation efficiency of ceftriaxone can reach to 90% under optimum conditions. We evaluated the bioremediation of ceftriaxone in wastewater using *Bacillus cereus* Cef 3. The removal efficiency at 7 h was 90.0% for the group added with additional carbon source (glucose, starch and yeast extract), pH (8.5), optimum temperature (30˚C), and inoculum density. Strains identification was accomplished through 16s rRNA ribotyping by Lab Genetix. The regression coefficient obtained was $R2 = 0.99$, which show that the predicted values and the experimental values are closely fitted. *Bacillus cereus* Cef 3 effectively degraded ceftriaxone resistant bacteria and can be utilized for successful bioremediation of ceftriaxone contaminated waters. This study provides information about efficient removal of antibiotics under optimum condition and can be utilize in future for removing antibiotic pollution without any harm to environment.