ABSTRACT

Toluene is an important constituent of various commercial products including paints, dyes, cosmetics, pharmaceuticals, various chemicals and plastic articles. It is a natural component of crude petroleum and petroleum products such as gasoline and diesel fuel. It is carcinogenic and declared as priority pollutant due to its resistance to degradation. The present study aimed to isolate the high-efficiency toluene metabolizing bacteria from petrol contaminated soil samples. Isolation was carried out through enrichment culture, serial dilution and pour plate methods using the toluene supplemented minimal salt media. The isolated bacteria were analyzed to document growth behavior, petrol removal efficiencies, antibiotic resistance profile and biochemical characteristics. All were sensitive to the antibiotics streptomycin and ciprofloxacin, some were resistant against penicillin and ampicillin. The 16S rRNA based phylogenetic analysis helped to reveal the identity of isolated bacterial species and construct the phylogenetic trees. Total five bacteria were isolated out of which two (GCT1, GCT11) were identified as *Pseudomonas aeruginosa,* two (GCT3, GCT7) shared homology with *Bacillus subtilis,* and one (GCT2) with *Bacillus thuringiensis.* All the isolates were fast growing and exhibited considerable toluene degradation potential. The highest toluene removal efficiency (98%) was recorded for the strain GCT3 at toluene concentration 40ul. As the isolated bacteria transformed toluene into relatively less toxic molecules and thus can be preferably exploited for the eco-friendly remediation of toluene.