Evaluation of pH and temperature effects on mycoremediation of phenanthrene by Trichoderma sp.

Abstract

Polycyclic aromatic hydrocarbons (PAHs) are a group of ubiquitous persistent organic contaminants found in the environment most of which are toxic, mutagenic, teratogenic and carcinogenic. For an effective bioremediation of PAHs using micro-organisms, optimum environmental conditions needs to be in place for degradation to occur. The aim of this study was to investigate the effect of physical factors such as pH and temperature on phenanthrene degradation by a sediment fungal isolate Trichoderma sp. SY1 using liquid Mineral Salt Broth (MSB). Both parameters; temperature and pH was observed to significantly affect the strains ability to degrade phenanthrene. Maximum phenanthrene degradations was achieved at a temperature of 35°C and a neutral pH of 7 where degradation efficiencies of 69.5% and 76.8% were achieved respectively with a corresponding high biomass accumulation of 62mg and 48mg dry weight at same temperature and pH points. Lower phenanthrene degradations and fungal growth were observed at lower and higher temperatures. It can be concluded that an optimum pH of 35°C and pH of 7 best supports the strains ability to degrade phenanthrene and should most likely be applied in the microbial PAHs degradation, using this strain.

Keyword: Environmental factors; PAHs; Optimization; Fungi; Biomass