

## The effects of phenanthrene degrading bacteria on its concentration in shoots of wheat

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### INTRODUCTION:

Increasing environmental pollution by chemicals is one of the great problems of humanity in this century. These environmental pollutants classified into natural pollutants and pollutants resulting from human activities. Polycyclic aromatic hydrocarbons (PAHs) are a group of organic contaminants that have accumulated in the environment. These compounds mainly produced by incomplete combustion of fossil fuels and different industrial activities (Chauhan, 2008). PAHs are important concern for natural ecosystems because these compounds are toxic, carcinogenic and have high stability in the environment (Gao, 2006). Plant can uptake of these compounds and PAHs entering into the food chains can leads to serious health problems in humans (Chauhan, 2008). Based on the rings numbers in the structure of the PAHs thes compounds divided into two groups as low molecular weight such as naphthalene, Flurene, anthracene, and Phenanthrene and high molecular weight such as fluoranthene, pyrene, benzopyrene and benzofluoranthene. Generally their toxicity and persistence in the enviroment was higher with increasing molecular weight of PAHs . Phenanthrene half-life in soil is 16-126 days, while benzopyrene half-life is 229-1500 days. Biological factors can affect the stability of these compounds in the environment. For example, some of the soil microflora can degrade PAHs. Bacillus, Pseudomonas, Vibrio and Enterobacteriaceae family are some examples (Chauhan, 2008). Phenanthrene is a low molecular weight hydrocarbons consisting of a benzene ring and is the anthracene isomer. The molecular weight of this compound is 178/22 g / mol.. PAHs are almost insoluble in water solution (Faust, 1993). This compounds can reduce germination and growth parameters such as plant biomass. Plants such as wheat can uptake phenanthrene by roots and transport it to the shoots (affable, 1390). Wheat is a crop widely consumed by some livestock and human. Thus, contamination of this plant can lead to significant harmful effects on human health. Because of these compounds uptake by plants and ability of some bacteria in degradation of these compounds, in this research we isolated phenanthrene degrading bacterial strains from contaminated soils and investigated their effects on