ABSTRACT:

Phenanthrene degradation by polyergus sp. s133*A new phenanthrene-degrading strain*Was investigated in this work. the analysis of degradation was performed by calculation of the remaining phenanthrene by gas chromatography-mass spectrometry. when cells were grown in phenanthrene culture after 92 h*All but 200 and 250 mg/l of the phenanthrene had been degraded. new metabolic pathways of phenanthrene and a better understanding of the phenoloxidases and dioxygenase mechanism involved in degradation of phenanthrene were explored in this research. the mechanism of degradation was determined through identification of the several metabolites*9*10-phenanthrenequinone*2 *2'-diphenic acid*Salicylic acid*And catechol. 9*10-oxidation and ring cleavage to give 9*10-phenanthrenequinone is the major fate of phenanthrene in ligninolytic polyergus sp. s133. the identification of 2 *2'-diphenic acid in culture extracts indicates that phenanthrene was initially attacked through dioxigenation at c9 and c10 to give cis-9 *10-dihydrodiol. dehydrogenation of phenanthrene-cis-9*10-dihydrodiol to produce the corresponding diol*Followed by ortho-cleavage of the oxygenated ring*Produced 2*2'-diphenic acid. several enzymes (manganese peroxidase*Lignin peroxidase*Laccase*1*2-dioxygenase*And 2 *3-dioxygenase) produced by polyergus sp. s133 was detected during the incubation. The highest level of activity was shown at 92 h of culture.