

IDENTIFICATION AND QUANTIFICATION OF SPECIFIC SAPROPHYTIC FUNGI EXUDATES IN RESPONSE TO Pb STRESS, USING CAPILLARY ELECTROPHORESIS

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ABSTRACT

Lead is one example of a very commonly occurring metal found at contaminated sites, and the remediation of heavy metals such as lead is done in different ways. Soil wash and immobilisation techniques are usually employed but there is a need to find more environmentally friendly and cost-effective alternatives.

There are today methods available where microorganisms are being used to bioremediate contaminated areas. These techniques are, however, designed to be used for organic substances, e.g., petroleum products and PAHs. One promising technique is bioremediation of heavy metals using fungi and/or their exudates.

Heterotrophic, saprophytic fungi are known to interact with different forms of heavy metals, thereby producing different forms of organic chelators. The aim is to identify these substances and to ascertain their biodegradability. Substances that already have been identified are different low molecular weight organic acids. There have also been discussions about the importance of siderophores and metallothioneins, but there have been few investigations on the importance of free amino acids.

Introductory investigations have been performed on seven isolated saprophytic fungi together with one soil contaminated with Pb. Specific exudates have been identified using capillary electrophoresis, and the different results are depending on organism and their energy source.