Screening of ectomycorrhizal fungi for mycorrhizal remediation of toxic heavy metals

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Heavy metal contamination caused by either natural process or human activities is one of the most serious environmental problems on earth. Phytoremediation composed of herbaceous plants and the symbiont arbuscular mycorrhizal fungi (AMF) in nature has been applied to remediate soil pollution by taking up toxic metals from the polluted soils through the roots and hyphae. However, the present author expects that a novel mycorrhizal remediation system composed of woody plants associated with ectomycorrhizal (ECM) fungi is more effective than the phytoremediation with herbaceous plants associated with AMF on the following points: 1) The mycorrhizal remediation system may remediate wider and deeper area in the soil compared to phytoremediation using herbaceous plants with AMF. 2) ECM fungi may produce greater amounts of organic acids than plant roots. The acids are essential to solublize water insoluble metal salts to give metal organic acid chelates which are expected to be taken up through mycelia and plant roots. Therefore, the objective of this study is to screen out ECM fungi for development of mycorrhizal remediation of toxic heavy metals. Several ECM fungi have been chosen as candidates for mycorrhizal remediation.