

Phyto-Myco Remediation Study at Taylor Yard G2 Parcel



Danielle Stevenson
PhD Candidate in Environmental Toxicology
University of California, Riverside
Contact: dstev013@ucr.edu



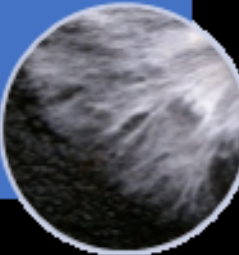
Biological remediation involves working with living organisms to address harmful substances in soil.

Phytoremediation



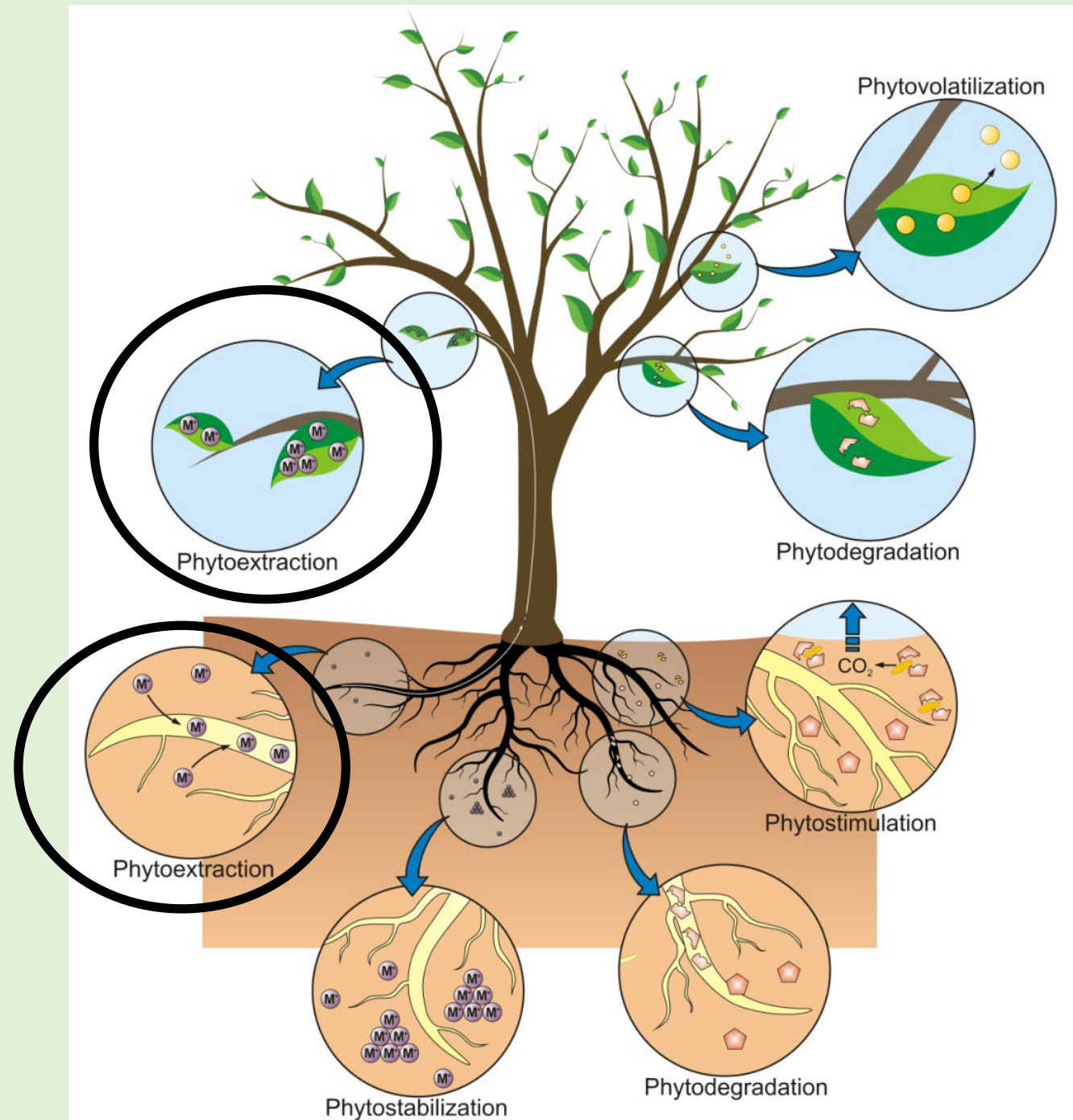
uses living plants to extract or stabilize hazardous metals or degrade certain contaminants, thereby cleaning soils

Mycoremediation

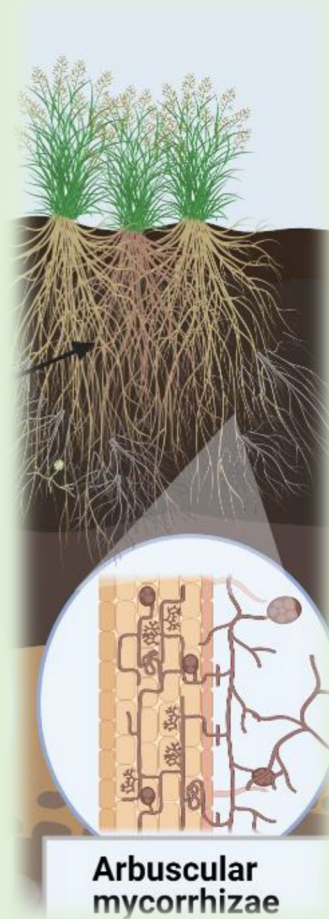
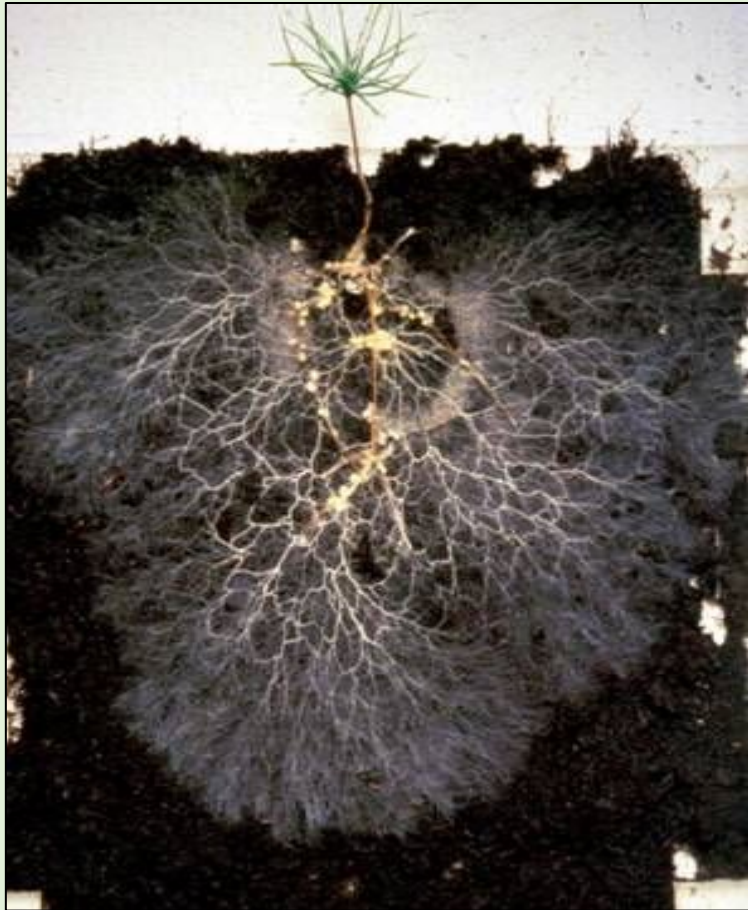


uses fungi to degrade or sequester contaminants in soil

Phytoremediation of metals: extraction or stabilization



Arbuscular mycorrhizal fungi (AMF) help plants grow and may help them extract more metals and enhance phytoremediation success



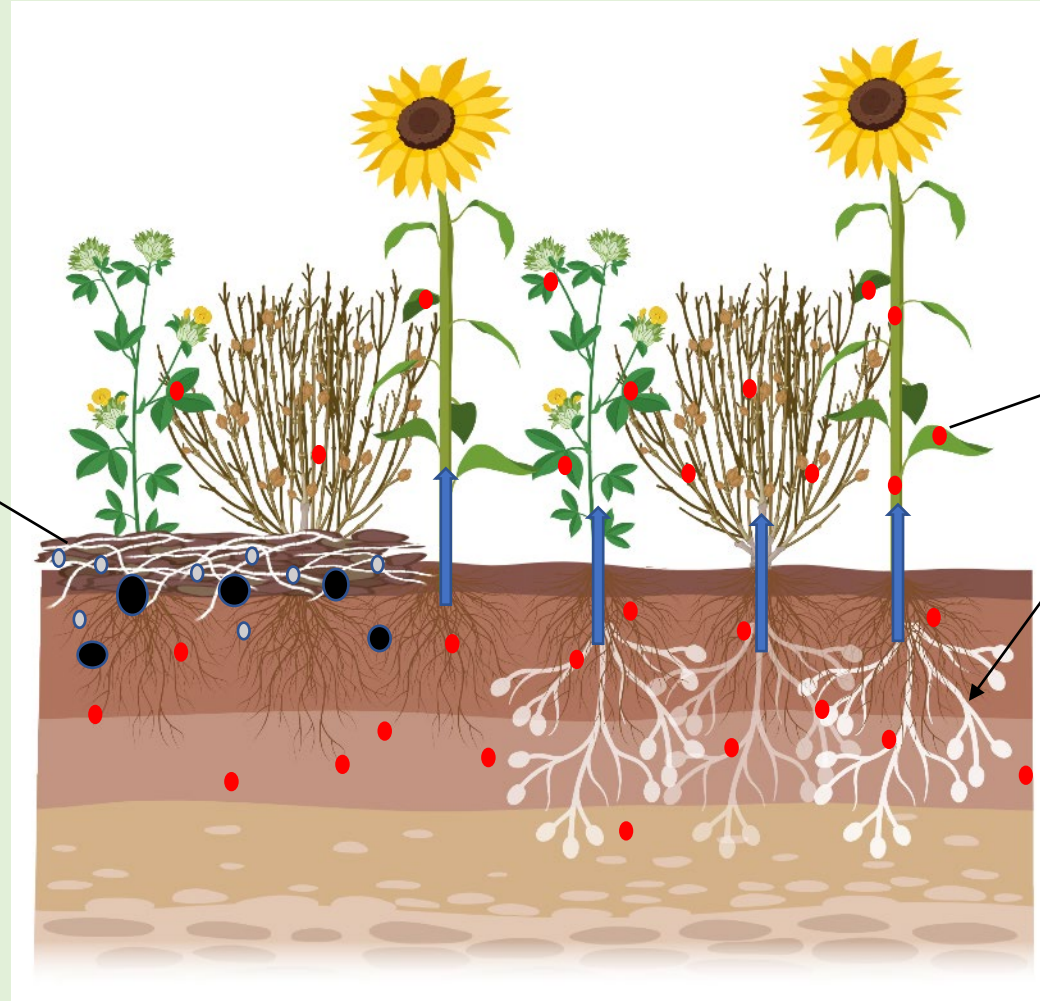
Other fungi who are **decomposers** have been found to be able to break down diesel and other petroleum-hydrocarbon contaminants, leaving clean soil behind.

How does Phyto-Myco Remediation Work?

Mycoremediation

Beneficial decomposer fungi 'eating' and breaking down diesel into non-toxic soil

- → **Diesel** (a petroleum Hydrocarbon contaminant)
- → **Diesel** broken down by fungi into less toxic forms



Myco-assisted Phyto-extraction

Plants take up metals from the soil into their aboveground parts ("**phyto-extraction**")

Helper '**mycorrhizal fungi**' around the roots of plants helping them take up more metals

- → **Lead (Pb)** and other hazardous metals such as cadmium (Cd), chromium (Cr) and arsenic (As)

Plants and fungi to be tested:

Native Plant Metal Extractors



Telegraphweed
(*Heterotheca grandiflora*)

California buckwheat
(*Erigonum fasciculatum*)



Fungal remediators



- Indigenous AMF only
- Commercial AMF inoculum

- Native decomposer fungi (*Pleurotus ostreatus*)
- Indigenous decomposer fungi only



The study will take place on a small portion of Taylor Yard's G2 parcel



It will start this winter and be in place for 1 year.

UCR's research team will be monitoring and testing the soil and plants every two weeks to track remediation progress.

3 other brownfields around the city are participating in the study.

Risk reduction from remediation study activities

Dust control

- woodchips applied 1-2 inches deep around plots to prevent dust from leaving the study area
- water applied to soil prior to site preparation

Restricted access

- each site is protected from human entry by tall, barbed-wire fencing and locked gates for restricted entry.

Disposal of plants used in the remediation

- plant matter used in the study will be disposed of through UCR's Environmental Health and Safety hazardous waste pickup.

Q+A

For more information

<https://phyto-myco-remediation.ucr.edu/>

Contact:

Danielle Stevenson

Email: dstev013@ucr.edu