



MERCURY
- AMF

Myco-phytoremediation of mercury polluted soils in Ghana and Burkina Faso

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State of the art and motivation for research: *Mercury pollution and Artisanal Gold Mining*

- Easy and quick method to extract gold from alluvial ores or sediments



Process of artisanal gold extraction

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- Problem: use of toxic Mercury (Hg), exposing sedimentary rocks with high Arsenic (As) content

Surface mining is most likely the greatest agent of land degradation in Ghana and Burkina Faso.

Environmental concerns include limited access to potable water, loss of soil fertility, biodiversity and vegetation cover. Mercury used for gold amalgamation is a major health hazard.

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Project Idea

The necessary steps in the recovery of land after gold mining required legislative enactments including ***the cultivation of pioneer plants that grow on polluted soils*** and can constantly ***reduce the mercury concentration in the soil.***



Mucuna Puriens



Pueraria phaseoloides



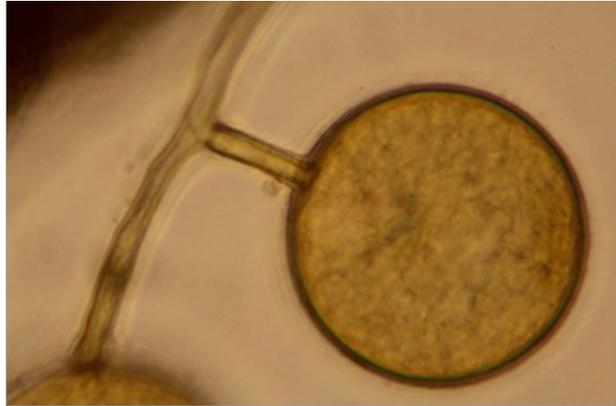
Gliricidia sepium



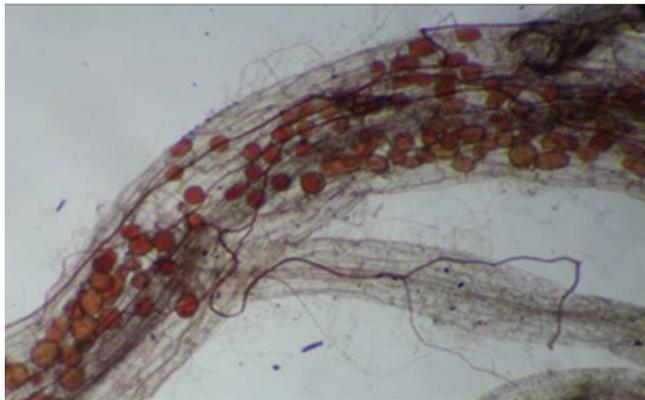
Leucaena leucocephala

Tropical nitrogen-fixing trees (legumes), which form a symbiosis with nitrogen-fixing bacteria (rhizobia) in their root nodules, showed promising potential for the desired recovery of land for agricultural production.

Project Idea



Vital spores of mycorrhizal fungi



Leguminous trees produce large quantities of biomass in the form of leaves and a dense network of fine roots that have a high capacity for extensive symbiotic *mycorrhizal* associations (AMF-plant associations).

Very probably, these *mycorrhizal fungi* with their dense hyphal network strengthen the potential to remediate Hg-contaminated soils.



Field trial on phytoremediation of former gold mine territory in Ghana

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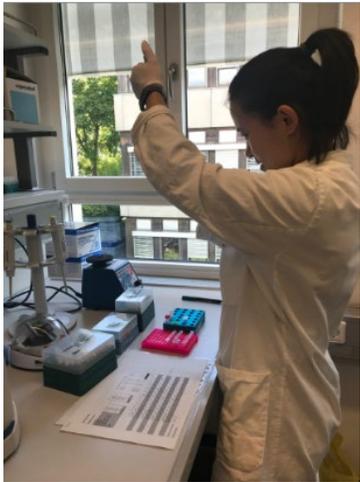


First Activities and Findings

- Plant candidates for AMF-plant associations were selected including *Acacia mangium*, *Brassica juncea*, *Leuceana leucocephala*, *Mimosa pudica*, *Moringa oleifera* and *Senna siamea*
- Root-organ culture experiments and greenhouse experiments with different levels of mercury contamination were settled with selected plants in order to clarify the mechanisms of plant tolerance and remediation with locally adopted plants associated with AMF



- Mycorrhiza trap cultures were established
- Analysis of soil and plant samples for isolation of AMF-candidates
 - (1) Tolerant to Mercury
 - (2) Capable to live in symbiosis with indigenous plant species
- Gathering information on legal and political framework conditions



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Further information can be found at the web-site of the project!

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