

Arbuscular mycorrhizal fungi in arsenic-contaminated areas in Brazil

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Arbuscular mycorrhizal fungi (AMF) are ubiquitous and establish important symbiotic relationships with the majority of the plants, even in soils contaminated with arsenic (As). In order to better understand the ecological relationships of these fungi with excess As in soils and their effects on plants in tropical conditions we evaluated the occurrence and diversity of AMFs in areas affected by gold mining activities in Paracatu (Minas Gerais State, Brazil). This study is the first one carried out in Brazil and results show a total of 23 AMF species occurring in As contaminated soils. Soils of four areas with different As concentrations were sampled: Reference Area (10 mg dm⁻³ As); B1 (subsuperficial layer) (396 mg dm⁻³ As); barren material (573 mg dm⁻³ As) and, mine waste (1046 mg dm⁻³ As). Soil sampling was carried out in December 2008 (rainy season) and in September 2009 (dry season), including six composite samples per area, totaling 24 samples. Arbuscular mycorrhizal fungi occurred widespread in all areas, being influenced by the As concentrations and sampling periods. The identified

species belong to the following genera: : *Acaulospora* (10 species), *Scutellospora* (4 species), *Racocetra* (3 species), *Glomus* (4 species), *Gigaspora* (1 species) and *Paraglomus* (1 species). The most frequent species were *Paraglomus occultum*, *Acaulospora morrowiae* and *Glomus clarum*, which occur in all four areas. The predominance of these species indicates their high tolerance to excess of As. Although arsenic contamination reduced the number of species of AMFs, there was an increase in species of these fungi when plants were present. Our results showed that As contaminated soil affected negatively AMF occurrence and species richness, but the presence of host plant counterbalanced this problem, a process that is important to know if one is planning to recover As contaminated soils using plant seedlings inoculated with mycorrhizal fungi.

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