

Title: ARBUSCULAR MYCORRHIZA AND ADDITION OF PHOSPHATE IN SEEDLINGS GROWTH OF BRACATINGA (*MIMOSA SCABRELLA*) IN SOIL DEGRADED BY COAL MINING

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Abstract:

The revegetation of degraded areas by coal mining is a technology that promotes the improvement of physical, chemical and biological soil conditions with low cost. This technology combined with the Arbuscular Mycorrhizal Fungi (AMF) inoculation and soil fertilization, contribute to the establishment and survival of pioneer plants under stress conditions in degraded environments. The aim of this work was to evaluate the effects of inoculation the AMF isolates and phosphate addition on the growth of bracatinga (*Mimosa scabrella*) grown in coal mining soil in Santa Catarina state. The experiment with seedlings of bracatinga was carried out by 11 weeks in factorial random design 6x3 [six inoculation treatments (*Acaulospora morrowiae*, *Gigaspora albida*, *Rhizophagus clarus*, *Acaulospora colombiana*, *Claroideoglossum etunicatum*, and non-inoculated treatment as a control) and three phosphate concentrations (0, 50 e 200 mg dm⁻³ applied as triple superphosphate)] with 10 repetitions each. The non-sterilized soil was packaged in tubes of 175 cm³ and the variables to be assess was height, stem diameter, dry weight of above-ground tissue and root mycorrhizal colonization. Only height from all the variables studied has interactions between both factors, with an average increase of 29.5% in plants inoculated with *A. morrowiae* and control plants with 50 mg dm⁻³ P compared with the others treatments. Even though has not statistical difference in stem diameter, it was found increases of 31% in dry weight of above-ground tissue due to the addition of phosphate in both doses (50 and 200 mg dm⁻³ P), independent from the AMF inoculation. The seedlings inoculated with *C. etunicatum*, *G. albida* and *R. clarus* shown higher root colonization with values ranging of 64 to 73%, but this didn't implies a contribution to seedlings growth. In conclusion, the inoculation of AMF had not an additive effect over bracatinga's seedlings development compared with control treatment, indicating that AMF not adapted to stress conditions doesn't benefit the seedling growth of this plant species in non-sterilized soil, while phosphate addition was the factor with positive responses to bracatinga's growth in coal mining degraded soils.

Keywords: mycorrhizal fungi, fertilization, recovery of degraded areas

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