Geophysical Research Abstracts, Vol. 8, 03795, 2006
SRef-ID: 1607-7962/gra/EGU06-A-03795

Interactions between a plant growth-promoting rhizobacterium, an AM fungus and a phosphate-solubilising fungus and their effects on indicators of soil biological quality in a *Lactuca sativa* plantation

J. Kohler (1), **P. Torres** (2), F. Caravaca (1), L. Carrasco (1) and A. Roldán (1)

(1) CSIC-Centro de Edafología y Biología Aplicada del Segura. Department of Soil and Water Conservation., (2) Department of Applied Biology. Botany. Universidad Miguel Hernández de Elche.(mp.torres@umh.es/ Fax:+34 96 665 8511)

This study evaluated the interactions between the inoculation with an arbuscular mycorrhizal fungus, Glomus intraradices Schenck & Smith, a plant growth-promoting rhizobacterium, Bacillus subtilis, and a filamentous soil fungus, Aspergillus niger, with respect to their effects on indicators of soil biological quality (microbial biomass C, water-soluble C and carbohydrates and dehydrogenase, urease, protease-BAA and acid phosphatase activities) in a lettuce plantation. The inoculation with A. niger, B. subtilis or G. intraradices had no significant effect on soil water-soluble C. Water-soluble carbohydrates and microbial biomass were increased only in the rhizosphere soil of G. intraradices-plants. The combination of G. intraradices with A. niger was even more effective for increasing microbial biomass (about 56% higher than control soil). Rhizosphere soil from the treatments involving inoculation with A. niger, B. subtilis or G. intraradices had significantly higher dehydrogenase activity than the control soil, particularly in the soil inoculated with B. subtilis (about 21% higher than control soil). The inoculation with A. niger or B. subtilis increased significantly the urease, protease and phosphatase activities of the rhizosphere soil of the lettuce plants. The mycorrhizal inoculation only had a significant effect on the protease activity. The inoculation with B. subtilis was not sufficient to increase soil microbial biomass but was the most effective at reactivating global microbial activity of rhizosphere soil of lettuce plants. In general, the combined inoculations, involving two or three of the microor-

ganisms, changed the microbiological and biochemical parameters of the rhizosphere soil equally to or to a lesser extent than the individual inoculations.