TITLE: FUNGI DIVERSITY IN THE RHIZOSPHERE OF PLANTS IN COMPETITION

AUTHORS: MONTEIRO, L. C. P.[1]; MASSENSSINI, A. M.[2]; MORAIS, D. K.[3]; OLIVEIRA, M. V. N.[4]; TÓTOLA, M. R.[5]; COSTA, M. D.[1]

INSTITUTIONS: [1]Laboratório de Ecologia Microbiana, Departamento de Microbiologia/BIOAGRO, Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil; [2] Instituto Federal Goiano, Iporá, Goiânia, Goiás, Brazil; [3]Genomics and Computational Biology Group (CPqRR-FIOCRUZ), Belo Horizonte, Minas Gerais, Brazil; [4] Departamento de Ciências Básicas da Saúde, Universidade Federal de Juiz de Fora, Campus Governador Valadares, Governador Valadares, Brazil; [5]Laboratório de Biotecnologia e Biodiversidade para o Meio Ambiente, Departamento de Microbiologia, Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.

Plants have a strong influence on the microbial populations associated with their roots and, via root exudation, they promote changes in the soil microbial community. Several groups of fungi present in the rhizosphere play important roles that can influence plant growth and interactions with competing species. The objective of this work was to evaluate the fungi taxa present in the rhizosphere of plants in competition and in monoculture and relate them with growth-promoting activities already reported. The experiments were conducted in a greenhouse at the Department of Microbiology, UFV. Two crop species, *Zea mays* L. and *Glycine max* (L.) Merr., and three weed species, *Ageratum conyzoides* L., *Ipomoea ramosissima* (Poir.) Choisy, and *Bidens pilosa* L., were cultivated in monoculture or combined with each other. The DNA from the rhizospheric soil was extracted, and PCR amplification of the fungi ITS gene were carried out to perform sequencing through the Illumina MiSeq platform. For *Zea mays* rhizosphere soil in monoculture and in competition with weeds, 528,560 sequences were obtained for fungi and for *Glycine max* rizospheric soil, 371,526 sequences. Our results showed that the OTUs of fungi found in the rhizosphere soil from *Z. mays* in monoculture and in competition with weeds were classified into 6 phyla, 50 orders, and 170 different genera. In the rhizosphere of *G. max* in monoculture and in competition with weeds, the OTUs were classified into 5 phyla, 53 orders, and 168 different genera. The most abundant phyla of Fungi in all samples were Ascomycota, Zygomycota, and

Glomeromycota. The Glomeromycota represented 1.1 % and 1.5 % of the total fungal relative abundance in the rhizosphere of corn and soybean, respectively. This phylum includes all arbuscular mycorrhizal fungi, which have important ecological roles that promote plant growth, such as improving plant nutrition, protecting their hosts from pathogens and facilitating mineral nutrient uptake. The genus *Penicillium* was significantly different between all treatments. This genus is considered a plant growth promoting agent because of its ability to solubilize inorganic phosphate, making it available to plants. The competition between the crops and weeds caused changes in the fungi communities in the rhizosphere associated with these plants depending on the competition conditions.

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