

IDENTIFICATION AND CHARACTERIZATION OF ARBUSCULAR MYCORRHIZAL FUNGAL COMMUNITIES ASSOCIATED WITH PRAIRIE CORDGRASS

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ABSTRACT

Prairie cordgrass (*Spartina pectinata*) is one of the perennial grasses that is considered to be the future of the bioenergy industry due to low required inputs, high energy production, and low greenhouse emissions compared to annual crop plants. The primary goal of this study is to identify and to characterize natural communities of arbuscular mycorrhizal (AM) fungi that are associated with prairie cordgrass. AM fungi improve the nutrient supply of their host plant and increase the abiotic and biotic stress resistance and could play a significant role as “biofertilizers” and “bioprotectors” in sustainable agriculture of bioenergy crops. Prairie cordgrass samples were collected from different sites in Brookings County, South Dakota, and were examined for their mycorrhizal colonization. The AM fungal communities were characterized by denaturing gradient gel electrophoresis after DNA extraction and amplification through a nested polymerase chain reaction approach with primers targeting the fungal 18S ribosomal gene. All samples were colonized with indigenous AM fungal communities, and the colonization rate in most samples was higher than 60%. The intracellular structures of the fungus within the mycorrhizal roots were primarily of the Paris-type and were characterized by the formation of scarcely branched intracellular hyphal coils, intercellular and intracellular vesicles, and only few intercellular hyphae.