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Observation of ectomycorrhizal fungi (ECM) structures in Eucalyptus deep roots (São Paulo, Brazil)

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Many field observations suggest that ECM contribute to a number of key ecosystem functions such as carbon cycling, nutrient mobilization from soil organic matter and soil minerals, providing a link between trees through common mycorrhizal networks. In Brazil, the ECM form symbiotic associations with species of great economic importance, belonging to *Eucalyptus*. Until recently, most of the work on ECM functioning has been done in laboratory or in nursery conditions and field studies examining trees and their fungal associates in forest ecosystems are scarce. Furthermore, most of the studies are concentrated in the superficial soil layers and studies that assess root colonization by mycorrhizal fungi at depths > 50 cm are few. The ECM root tips can be morphologically described and classified into morphotypes or anatomotypes. This study aimed to determine the presence of ECM structures in deep roots of *Eucalyptus grandis* (2 to 4-year-old). Two types of observations were made down to a depth of 8 m: a-) minirhizotron were used in a deep pit to examine fortnightly the development of fine roots from 2011 to 2013; b-) fragments of roots were collected in March/2013 during the excavation of a deep pit and observed with a microscope. The study was conducted at the Itatinga Experimental Station (University of São Paulo) in a Ferralsol. ECM structures show by changes in coloration and morphology of roots, as well as fungal heath and hyphae were photographed. Similar ECM structures were found from the soil surface down to a depth of 3 meters. The genus *Cenococcum* was associated with roots at 50 cm and the determination of genus associated with very deep roots is in progress. These types of methodology (minirhizotrons and observation of root fragments) allowed us to verify the presence of morphological alterations in very deep roots associated with ECM.

Keywords: deep roots, ectomycorrhizal fungi, Ferralsol, Eucalyptus