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Effects of mycorrhizal inoculation on responses of tomato plants in the early stages of the symbiosis

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Abstract

Arbuscular mycorrhizae represent the most common type of plant symbiosis. It is commonly considered mutualistic; however, considering that the interactions between organisms can change during their life cycle, a more correct interpretation describes it as a *continuum* between mutualism and parasitism. The arbuscular mycorrhizal (AM) fungus, belonging to the phylum Glomeromycota, supplies nutrients to the host plant and in return it receives photosynthates to complete its life cycle. Numerous evidences suggest that this symbiosis can modify different plant physiological aspects. AM fungi are generally inoculated as mixtures of spores and root colonized fragments. In these conditions, hyphae or germinating spore tubes present in the inoculum colonize the roots of the germinated seedling and the fungus does not yet have a dense hyphal network to absorb water and minerals. Until the fungus reaches full development, the extra-radical mycelium is built only at the expense of the carbon provided by the plant. Conversely in natural conditions the colonization of the fungus is often carried out starting not only from the spores, but also from the extraradical hyphae of the fungi linked to other mycorrhizal plants, that form a dense network called Common Mycorrhizal Network (CMN). Under these conditions the fungus already has a large hyphae network capable of receiving the carbon that it needs from the plants previously colonized.

Few works describe what happens to the plants during the early stages of AM fungi colonization. For this reason, the aim of this work was to assess the effects of AM fungus *Funelliformis mosseae* on tomato plants applying two different methods of inoculation: i) a system in which the fungus has a widely developed external hyphal network and ii) a system in which it requires nutrients from the plant itself in order to grow and develop its own mycelium. In both the tested experimental systems few effects due to the presence of the fungus were observed and no stress symptoms were detected so the fungus did not behave as a parasite.

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Biography

Patrizia Cesaro is a researcher at the Università del Piemonte Orientale “Amedeo Avogadro”, Italy. She graduated cum laude in Biological Sciences at the University of Torino, she received a Specialization in Applied Biothecnology with an evaluation cum laude and finally she received PhD in "Environmental Science, internal waters and agroecosystems" at the University of Piemonte Orientale “A. Avogadro”. Her research has been focused in molecular biotechnology, she has a good expertise molecular biological techniques.

