In vitro Propagation of Arbuscular Mycorrhizal Fungi Using Whole Plant

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Abstract

Root tissue culture using T-DNA transformed roots together with AM spores is a new technique which has recently been used for *in vitro* propagation of these fungi. Despite the importance of this technique, some doubtful points are involved: (1) lack of photosynthetic organ, (2) incomplete balance between source and sink, (3) presence of sucrose in the medium and lack of hormonal balance in host plant, which might affect the plant-fungus relationship. In this study, the whole plant system with photosynthetic part, instead of transformed root, was used for *in vitro* culture of AM. Alfalfa, clover and leek were used as host plants and *Glomus intraradices* was the AM species. MSR medium without sucrose and vitamins was used as substrate for seedling growth. AM spores and hyphae obtained from *in vitro* culture by transformed roots were applied to the medium in closely contact with fine root system. The top plant was oriented into PVC tube attached vertically to the top plate. Results revealed that the development and establishment of AM were better in alfalfa and clover grown in plates harboring PVC tube as protective device against desiccation and contamination. Although, the number of spores and hyphal growth obtained in this system were lower than that of transformed root system, but the spores were formed in natural condition. In plate method lacking protective tube, the plants died after two weeks, due to higher evapo-transpiration and water depletion in the medium. Microbial contamination, in some extent, was also occurred in latter system. The techniques used in this study are addressed in details.

Keywords: Arbuscular fungi, *in vitro* culture, Hormonal balance, Transformed root, Inoculums

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