Arbuscular Mycorrhizal Fungi induced Systemic Biocontrol against Root-Knot Nematode on Chilli

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Root-Knot in chilli roots caused by nematode (*Meloidogyne incognita*) is a serious problem for chilli crops production in Thailand. Managing nematode by the excessive use of pesticides is severely harmful either farmers or other food chain consumers, and together with the general ban on the use of methyl bromide have given particular push to the search and use of microorganisms as biocontrol agents.

Arbuscular mycorrhiza fungi (AMF) colonize roots of most plant species. AMF and plants live in a symbiotic relationship where both partners derive benefits from the association. Mycorrhizal root colonization has great potential as biocontrol agent against a broad range of soil-borne fungi and nematodes, however, only few studies so far examined AMF-plant parasitic nematode interaction are available on a systemic bioprotective effect of mycorrhizal root colonization. Therefore, The aims of the studies were conducted to study whether a systemic bioprotectional effect of AM on parasitic nematode depends on the degree of root colonization by the AMF and whether this systemic bioprotectional effect can be linked with the accumulation of SA.

In the experiments 3 AMF inoculums; *Funneliformis mosseae*, *Rhizophagus irregularis*, and the mix strains inoculum (consist of *Funneliformis sp*., *Acaulospora sp*., *Gigaspora sp*., and *Scultellospora sp*.), were performed with chili split-root systems. The different strains of AMF inoculation were applied prior to or after or simultaneous to one side of the split-roots and the other sides of split-roots were inoculated with 1000 eggs/ml-the egg nematode solution.

The studies indicated root-knot was systemically reduced when chilli roots showed high degrees of mycorrhizal root colonization, especially, in the mix strains inoculum treatment, whereas a low mycorrhizal root colonization exhibited no effect on root-knot nematode infestation. From the results show a clear systemic bioprotectional effect depending on the degree of root colonization by the mycorrhizal fungus. At a higher mycorrhizal colonization rate the concentration of salicylic acid (SA) was increased in roots colonized by the mycorrhizal fungus but no systemic increase of SA could be measured in nonmycorrhizal roots of mycorrhizal plants, indicating that the systemic bioprotectional effect against root knot nematodes is not mediated by salicylic acid.