

WHEY-BASED FUNGAL MICRO-FACTORIES FOR IN SITU PRODUCTION OF ENTOMOPATHOGENIC FUNGI

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ABSTRACT

Whey-based fungal micro-factory technology is being developed to overcome economic and physical constraints associated with use of mycopathogens for management of insects and other pests. This novel formulation technology is based on inclusion of whey as a nutritive substrate to allow bio-control fungi to grow and multiply post-application. Laboratory experiments using the entomopathogen *Lecanicillium muscarium* applied to either sterile Petri dishes or field-collected hemlock foliage produced dramatic increases in number of entomopathogen spores (Fig. 1). Extensive fungal growth was noted on treated hemlock foliage, which upon re-isolation was identified as *L. muscarium*. This species of fungus has activity against hemlock woolly adelgid (*Adelges tsugae*), an invasive pest causing serious damage to the eastern hemlock and Carolina hemlock. Mycotol, an EU-registered product containing *L. muscarium*, is being researched for U.S. registration and deployment for management of hemlock woolly adelgid.

The dramatic increases in spore concentration in treatments that contain whey demonstrate the potential for whey-based fungal micro-factories to increase post-application abundance of bio-control fungi, such as *L. muscarium*. The observation that micro-factory production can be inhibited in treatments with high spore concentrations indicates that formulations must be optimized for maximal in situ production. This technology may be applicable to fungal bio-control agents other than entomopathogens (insect-killing fungi), such as mycoherbicides and fungi for management of mites, diseases, and nematodes attacking plants.

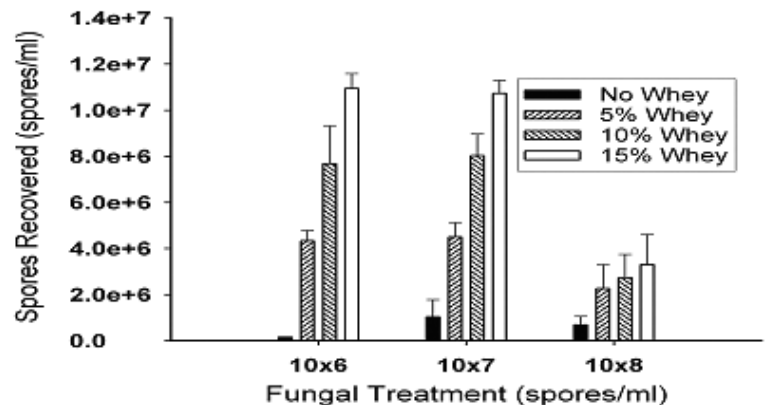


Figure 1. Spores recovered from Petri dish lids after 7 days of micro-factory production at the initial spore and whey concentrations indicated. The “no whey” treatments are the controls.