Abstract

Project Code: MRG 5080066

Project Title: Research and development on efficacy of symbiotic bacteria of entomopathogenic nematode to control mushroom mite.

Investigator: Dr. PRAPASSORN BUSSAMAN

Faculty of Technology, Mahasarakham University.

E-mail Address: prapassorn.c@msu.ac.th,

Project Period: December1, 2006 – November 30, 2008.

Luciaphorus sp. (Acari: Pygmephoridae) is the most destructive pest of mushroom cultivation in Thailand. This pygmephorid mite is responsible for the production losses of *Lentinus squarrosulus, L. polychrous*, *Auricularia auricula* and *Felmularia velutipes* mushrooms in the North and Northeast of Thailand. *Photorhabdus* and *Xenorhabdus,* the bacteria symbiotically associated with heterorhabditid and steinernematid nematodes, are known to be highly pathogenic to insects. This research aims to investigate the efficacy of symbiotic bacteria for controlling mite (*Luciaphorus* sp.) which is a pest of several mushroom species. Six species of symbiotic bacteria, *Xenorhabdus* sp. (X1), *X. nematophila* (X2), *X. poinarii* (X4), *Xenorhabdus* sp. (X5), *Photorhabdus luminescens* (P1) and *P. luminescens* akhurstii (P2), were tested for activity against mushroom mites. Among these cells suspension of $1x10^8$ cells/ml of *Xenorhabdus* sp. (X1) was showned to cause mite mortality up to 82.5%. Moreover, the 2- and 3- day old X1 bacterial cultures were found to be capable of causing mites mortality at 82.5 and 74.17%, respectively. In addition, the bacterial culture grown at an optimal temperature (30°C) could kill mites at a mortality rate of 83.33%. The cell-free supernatant of X1 was also found to kill effectively the mushroom mites at a rate as high as 90.83%. Furthermore, the cell-free supernatant of 2- and 3- day old X1 culture could result in mite mortality at 87.5 and 78.33%, respectively. From the X1 culture grown at 30°C, the cell-free supernatant could kill the mites at a rate of 87.5%. In conclusion, this study showed that both the cell suspensions and the cell-free supernatant of *Xenorhabdus* sp. (X1) bacteria has miticidal properties and that it possesses the potential as a biocontrol agent for controlling mites infesting the mushroom cultivation.