Pattara Opadith 2007: Effectiveness of Metabolites from Entomopathogenic Fungi to Control Two-Spotted Spider Mite, *Tetranychus urticae* Koch (Acari: Tetranychidae). Master of Science (Entomology), Major Field: Entomology, Department of Entomology. Thesis Advisor: Professor Angsumarn Chandrapatya, Ph.D. 124 pages.

Metarhizium anisopliae, *Hirsutella thompsonii* and *Beauveria bassiana*, are beneficial fungi used in controlling insect pests. Various solvents were used to extract metabolites from 5 fungal isolates found in Thailand namely, *M. anisopliae* # 2539 and # 2481, *H. thompsonii* # 13970 and # 13005 and *B. bassiana* # 2119. The fungal metabolites were extracted from 2 different media; rice brokens and malt extract broth. The fungal biomass filtrated from liquid media was also extracted. Thus, different amounts as well as efficacy of metabolites were acquired.

The efficacy studies of metabolites against *Tetranychus urticae* mite employing direct spray method at 3 concentrations were performed. After the spraying application for 1-3 days at 27-28 C and 70 ± 5% RH, it was observed that all 20 metabolites at the concentrations of 3, 5 and 10 % could kill and repel the two-spotted mite. They were also able to inhibit its egg-laying. From the rice brokens extraction, the 3% metabolite of *M .anisopliae* # 2539 had the highest percent killing of 55 and 31% repellency and 78.85% of egg-laying reduction. As for the extraction from crude filtrate, 3% metabolite of *H.thompsonii* # 13005 gave the greatest efficacy in mite control with 83% killing, 10% repellency and 88% egg-laying reduction. From the biomass extraction of 14 days old, (extracted with dichloromethane) 3% metabolite of *H. thompsonii* # 13005 showed the highest percent killing of 79%, 13% repellency and 90.47% of egg-laying reduction. Finally, biomass extraction using dichloromethane and methanol as solvents revealed that 3% metabolite of *H.thompsonii* #13970 was found to have the highest efficacy with 92% killing and 92.5% egg-laying reduction. According to cost of production, the lowest cost in fungal production was shown in solid media (rice brokens) where almost the same or higher amount of efficient metabolites than the liquid media was obtained except for *B. bassiana* # 2119.

The efficacy comparison of the metabolites from *M. anisopliae* # 2539 in rice brokens and *B.bassiana* # 2119 in liquid media by spraying the metabolites on the cowpea infested with the two-spotted mites indicated that, at the end of 3 weeks, every concentration could inhibit the increasing of mites population. With 0.5% metabolites of the 2 selected isolates, only 0.3 alive mites/leaf was observed while there were 142.07 mites/leaf in the control.

Pattara Opadith — Student's signature

A Chandrapatya — Thesis Advisor's signature

3 / 11 / 50