Ko Ko 2009: Insecticidal Activities of Three Essential Oils against *Sitophilus zeamais* Motschulsky and *Tribolium castaneum* (Herbst). Master of Science (Tropical Agriculture), Major Field: Tropical Agriculture, Interdisciplinary Graduate Program. Thesis Advisor: Professor Angsumarn Chandrapatya, Ph.D. 118 pages.

The insecticidal activities of essential oils extracted from the leaves of *Melaleuca cajuputi,* the mature fruits of *Litsea cubeba* and *L. salicifolia* were investigated under laboratory conditions. *Litsea cubeba* and *L. salicifolia* oils showed high repellency effects on *Sitophilus zeamais* and *Tribolium castaneum*, whereas *M. cajuputi* exhibited moderate repellency to *S. zeamais* and high repellency to *T. castaneum*. Generally, repellency effect increased with concentration of the essential oils. *Melaleuca cajuputi* evoked the highest fumigant toxicity on *T. castaneum* (213.17 μL/L) whereas *L. salicifolia* showed the highest fumigant toxicity to *S. zeamais* (4.435 μL/L), but its fumigant effect on *T. castaneum* was negligible. Meanwhile, *L. cubeba* had moderate fumigant effect on both species. Complete mortality of *S. zeamais* was detected when *L. cubeba* oil was applied at the rate of 370 μL/L 24 h after treatment. However, both *M. cajuputi* and *L. salicifolia* could only show the complete mortality of *S. zeamais* at the highest (556 μL/L) and the second highest (444 μL/L) application rates, 24 h after treatment.

Melaleuca cajuputi showed the highest contact toxicity to *S. zeamais* at the rate of 20% compared to *L. cubeba* and *L. salicifolia*. However, *M. cajuputi* oil was less effective against *T. castaneum* when compared *to S. zeamais* at all application rates. Meanwhile, *M. cajuputi* and *L. salicifolia* exhibited moderate contact toxicity against *T. castaneum* whereas *L. cubeba* had little contact toxicity to that species. Although *L. cubeba* oil could induce 100% mortality of *S. zeamais*, only 48% mortality of *T. castaneum* could be detected at the highest application rate and at the same duration. The complete mortality of *S. zeamais* was caused by 30% concentration of *L. salicifolia* at 3 d, whereas only 68% mortality of *T. castaneum* could be observed at the highest application rate (40%) at 7 d. In addition, *M. cajuputi* showed the highest antifeedant effect on *S. zeamais* than the other two oils whereas *M. cajuputi* and *L. salicifolia* had the highest antifeedant toxicity to *T. castaneum*. Up to 70% mortality of *S. zeamais* was caused by 8-10% concentrations of *M. cajuputi*, but only 5% mortality of *T. castaneum* could be detected at the highest concentration rate. In addition, only 24 and 12% mortality of *S. zeamais* and *T. castaneum* could be observed at the highest application rate of *L. cubeba* whereas only 4% mortality of *S. zeamais* and 10% mortality of *T. castaneum* could be found at the highest application rate of *L. salicifolia* oil.

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