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**The Thesis Submitted for the Degree of M.Sc (in the field of
Agricultural Entomology)**

**Effect of insecticidal and repellency of
essential oils of three plant species on
Tribolium confusum and *Callosobruchus
maculatus***

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October 2010

Abstract

In recent years essential oils have received much attention as pest control agents because of their insecticidal, repellent or antifeedant properties. Essential oils are volatile and can act like fumigants offering the prospect for use in stored-product protection. The fumigant toxicity and repellency effects of essential oils of three plant species, *Mentha piperita*, *Rosmarinus officinalis* and *coriandrum sativum* were investigated against two stored product insect species *Tribolium confusum* and *callosobruchus maculatus* F. at 27 ± 1 .C, 65 ± 5 % R.H under dark condition. The essential oils were prepared by water distillation method. The mortality of 1-7 days old adults of *T. confusum* and *C. maculatus* were investigated at exposure time for 3 to 24 h. the lowest concentration (42.85 μ l/l air) of *M.piperita*, *R.officinalis* and *C. sativum* essential oils caused 77.5; 37.6 and 25 % mortality of *T. confusum* and 100, 100 and 89.9% mortality of *C. maculatus* after 24h exposure time, respectively. *Callosobruchus maculatus* was significantly more susceptible than *T. confusum*. Values of 50% lethal dose of *M. piperita*, *R. officinalis* and *C. sativum* essential oils on *T. confusum* and *C. maculatus* were 31.3, 55.6, 648.68 μ l/l and 1/22, 0.72, 1.21 μ l/l respectively. The essential oils have significantly repelled insect. Rosemary essential oils were more repellent to *T. confusum* than other essential oils. The composition of essential oils was analyzed by gas chromatography mass spectrophotometry (GC mass) method. The predominant components in the in the *M. piperita* oil were Pipertitinone (19.1%), α -Terpinene (19%), Trans-carveol (14.5%), Isomentone (10.1%), β -caryophyllene (7.82%) and Menthol (3.3%), *R. officinalis* oil contained Piperitition (23.31%), α -Pinene (15.01%) Linalool (15.03%), 1,8-Cineol (7.41%), Borneol (3.3%), *C. sativum* oil contained Linalool (57.7%), Geranyle acetate (15.09%), β -Caryophyllene (3.26%) and Camphor (3.02%).

Key words: *Mentha piperita*, *Rosmarinus officinalis*, *Coriandrum sativum*, Essential oil, Fumigant toxicity, Repellency