

## POTENTIAL USE OF NUTMEG (*Myristica fragrans*) ESSENTIAL OILS TO CONTROL RICE WEEVIL (*Sitophilus oryzae*)

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Rice weevil (*Sitophilus oryzae*) is one of the major pests of stored rice as the adult weevils feed on rice and the females lay eggs inside rice kernels. Use of chemical insecticides is the common practice to control rice weevil rather than use of natural, eco friendly options. In this research, essential oils of nutmeg (*Myristica fragrans*) leaf, kernal, pericarp and mace were used to test the insecticidal and repellent effect against *S. oryzae*. To test insecticidal effect, two treatments were tested as, vapour in closed container and direct contact in closed container. Group of 20 weevils (10 to 14 days old) were tested and 60 mg of oil in 100  $\mu$ L of hexane was used in each experiment. Treated insects were held at  $28 \pm 2$  °C in the dark. Mortality was determined at 6, 12, 24 and 48 hours after treatments. Filter paper impregnation method was used to test the repellent effect of essential oils against *S. oryzae*. Each essential oil at 10 mg/mL concentration was prepared by dissolving oils in hexane. Group of 10 weevils of 10 to 14 days old were tested. From each oils in hexane, 100  $\mu$ L was applied to filter papers. The number of weevils settled on each filter paper were recorded at hourly intervals for 6 hours.  $PR = [(NC - NT)/(NC + NT)] \times 100$  was used to calculate the percentage repellency. Hexane was used as the negative control for every experiment. Complete mortality (100%) was observed with every tested oil within 6 hours after treatment in direct contact in closed container method. After 24 hours, the highest mortality of 95% observed with kernel oil in vapour in closed container method. The highest repellency percentage of 74.81% was observed with kernel oil. There was no significant difference between kernel and mace oils in fumigation effect and repellent effect experiments. It was found that, kernel and mace oils are much more effective in fumigation and repellent experiments. The results indicated the ability of nutmeg kernel and mace oil to protect stored rice from *S. oryzae*.

**Keywords:** *Essential oils, Fumigation, Myristica fragrans, Repellent, Sitophilus oryzae*