EFFECTS OF REDUCED-RISK INSECTICIDES ON *Cadra cautella* (WALKER) (LEPIDOPTERA: PYRALIDAE)

By

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A thesis submitted to the **Faculty of Applied Sciences,**

Rajarata University of Sri Lanka

in partial fulfillment of the requirements for award of the degree of

MASTER OF PHILOSOPHY IN ENTOMOLOGY

Faculty of Applied Sciences

Rajarata University of Sri Lanka

Mihintale - Sri Lanka

August 2020

ABSTRACT

The control of almond moth *Cadra cautella* (Walker) (Lepidoptera: Pyralidae), a major pest of stored food, using synthetic neurotoxic insecticides has limitations due to negative impacts on the biotic and abiotic environment. The use of sex pheromones, botanicals and reduced-risk insecticides are emphasized as safer alternatives for stored-product pest management but such details on *C. cautella* is minimum. Series of experiments were conducted to determine the effect of pheromone components (*Z*, *E*)-9,12-tetradecadienyl acetate (ZETA) and (Z)-9-tetradecadien-1-yl acetate (ZTA) on mating of *C. cautella* under different sex ratios and the presence of botanicals. Some other experiments tested effects of spinosad and spinetoram on larval mortality, adult emergence, progeny production, mating and burrowing ability of *C. cautella*. Two different pheromone blends of ZETA:ZTA (5:1 and 3.3:1) effectively reduced the mating of *C. cautella* by showing the highest mating disruption (MD). The low population sizes of *C. cautella* (male:female ratios 1:1, 2:2, 1:2 and 2:1) showed the highest MD. Both spinosad and spinetoram increased the larval mortality. Further, the both insecticides reduced the adult emergence and progeny production of *C. cautella*. Spinosad effectively suppressed the development of *C. cautella* than spinetoram. The exposure of *C. cautella* larvae to spinosad didn't affect mating as adults in the presence of ZETA. The mating of *C. cautella* was higher in the presence of botanical oils alone than with pheromone or pheromone+botanical oil. Burrowing depth of *C. cautella* larvae varies in different flour media. Spinosad increases the burrowing depth of *C. cautella* larvae in rice flour, mungbean flour and cowpea flour. The study summarizes that ZETA, ZTA, spinosad, spinetoram and botanicals have direct impacts on the biology and behavior of *C. cautella*. These findings will be useful in designing integrated pest management programs for *C. cautella*.

Keywords: *Cadra cautella*, mating disruption, Sex pheromone components, Botanicals, Reduced-risk insecticides, Burrowing

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