

Effect of solar heater boxes and constant temperatures on mortality and developmental stages of *C. maculatus*

ABSTRACT

Cardboard and Plywood were the materials which used for solar heater boxes to control adult and developmental stages of cowpea beetle *Callosobruchus maculatus* (F.) according to their effectiveness in previous study on solar heaters. The effect of solar heat on hatchability, oviposition, 4th instars and mortality was evaluated. Adult mortality, hatchability, oviposition and adult emergence were significantly affected by solar heater boxes treatment. A temperature of 66.4°C was achieved in solar heater boxes within 15 minutes which caused 100% mortality of adults and 4th larval instars of *C. maculatus* compared to 0% mortality after 1,2 and 3 days for untreated adults. Heat treatment decreased hatchability by 70% and 66.7% in Plywood and Cardboard respectively comparing with untreated eggs. To verify the effect of solar temperatures, another experiment was done using the oven. Adults of *C. maculatus* and eggs were exposed to constant temperatures to evaluate the effect on oviposition, adult emergence and mortality. Times needed for 100% adult's mortality were 10, 20, 40 and 50 minutes with temperatures of 70, 60, 50 and 40°C respectively. The oviposition was also affected significantly by different temperatures.

Keyword: *C. maculatus*; Solar heater boxes; Constant temperatures