

**Disinfestation of cocoa beans infested with life stages of *Tribolium castaneum* (Herbst)
(Coleoptera: Tenebrionidae) using solar heat trapped in a cardboard solar heater box**

ABSTRACT

Experiments were conducted to study the effects of solar heat treatment in a solar heater box on all the life stages, namely adult, larvae, eggs and pupa of *T. castaneum* infested on cocoa beans. Thirty (30) adults, larvae, eggs and pupae of *T. castaneum* were infested on cocoa beans and exposed to solar radiation in the solar heater box for 30, 45, 60, 90 and 120 min. Mortalities were assessed in the treated adults and larval stages 24 h after exposure for 3 days. Eggs hatchability and pupal eclosions were also assessed daily until 9 and 7 days after treatment respectively. The results show that adult and larval mortalities in the solar heater box treated populations were significant and ranged from 96.66-100%. Similarly, both egg hatchability and pupal eclosion were absolutely inhibited. It was concluded that the solar heater box can be used as a reliable tool for heat sequestrations for the eco-friendly control of *T. castaneum* on cocoa beans.

Keyword: Cocoa beans; *Tribolium castaneum*; Heat treatment; Cardboard solar heater box; Life stages of *T. castaneum*