

**ORIENTATION OF *Tribolium castaneum* (COLEOPTERA:  
TENEBRIONIDAE) ADULTS TO 4, 8-DIMETHYLDECANAL,  
KAIROMONE AND BOTANICAL OILS FOLLOWING AMBIENT,  
LOW, OR HIGH TEMPERATURE EXPOSURE**

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The red flour beetle (*Tribolium castaneum*) is a serious pest of stored food. The use of pheromones in pest management accompanies benefits over synthetic insecticides. The aggregation pheromone 4, 8-Dimethyldecanal (4,8 DMD) used alone or with kairomones traps *T. castaneum* but low efficiency is reported. Furthermore, insect orientation to pheromone/kairomones following low or high temperature exposure is not understood. This research evaluated orientation of *T. castaneum* adults to 4,8 DMD, commercial kairomone, botanical oils and their combinations following exposure to ambient, low, or high temperatures. Experiments were laid out using a completely randomized design. Fifty adults were introduced to the middle of rectangular glass chamber, and movement to treatment or control on either side was determined after 1 hr. In experiment one, insects reared at 30°C were used. Experiments two and three used insects pre-exposed to 10°C for 4 days and 42°C for 12 hrs, respectively at 2, 4, 6 or 8 hrs following cold/heat exposure. Each experiment was replicated four times. Percentage adults trapped were arcsin transformed and analysed using ANOVA procedures of SAS. The highest trapping occurred when 4,8 DMD combined with neem oil (76%), whereas the lowest was in coconut oil alone (23%). Neem oil alone demonstrated a repellent action, where more adults moved to control. In general, pre-exposure to cold or heat reduced orientation of *T. castaneum* adults to pheromone and kairomones; increased duration up to 8 hrs at ambient temperature increased their orientation. The adults pre-exposed to cold became more attractive than unexposed adults in pheromone only treatment after 8 hrs. Following pre-exposure to heat, adults were trapped similar to unexposed insects after 6 hrs, when pheromone combined with neem or coconut oil. This study concludes that pheromone combined with neem or coconut oil are promising attractants for *T. castaneum* adults exposed to ambient, low, or high temperature.

**Keywords:** Aggregation pheromone, Coconut oil, Low/high temperature pre-exposure, Neem oil, Orientation