

## ***Abstract***

*Rhyzopertha dominica* is one of three bostrichids (also *Prostephanus truncatus* and *Dinoderus bifoveolatus*) that are serious pests of stored cereal grains. The release of male pheromone by these species is known to be an important component of host selection; much less clear is the role of host odours. In *R. dominica*, previous research provides no consensus on the importance of host odours. By analysing locomotory responses, the behaviour of insects toward odour sources can be understood. To this end the movements of *R. dominica* toward host volatiles from wheat, brown rice and maize were investigated in an experimental arena, videoed and analysed using EthoVision software.

On average, only 37% of beetles arrived at the three clean food sources while 80% were able to locate wheat previously infested by conspecifics. In response to infested wheat, both females and males had an orientation component (taxis) in their behavior. However, females tended to be more attracted as they turned more (klinokinesis) and walked faster (orthokinesis). In contrast, male velocity was no different from that observed when males were exposed to clean wheat odours, only their frequency of turning (klinokinesis) was increased.

In response to airflow carrying the odours of clean wheat, brown rice or maize, beetles showed positive anemotaxis. However, there was no evidence of response to host odours as the locomotory responses of beetles to clean wheat odours were similar to clean air and the locomotory responses of beetles that were able to locate clean wheat were similar to those that failed to do so. After 3 or 4 days of starvation, beetles walked more slowly and a much lower number arrived at the food source. Moreover, beetle that had dispersed from a food source as well as females reared in an environment isolated from pheromone also did not show any difference in their behavioral response to wheat volatiles.

When the responses of the same beetles to host volatiles were tested twice in the area in a short time span, the ability of beetles to reach wheat, brown rice or maize was no better than that would be expected by chance. Therefore the current studies give no evidence that *R. dominica* uses host volatiles to locate the food sources tested. To the contrary, it would appear possible that primary host selection of cereals may occur by chance as would seem to be the case in *P. truncatus*.