Do walking *Rhyzopertha dominica* (F.) locate cereal hosts by chance?

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Abstract

To clarify the role of host odours in host location by walking *Rhyzopertha dominica* (F.) (Coleoptera, Bostrichidae), locomotory responses of beetles were investigated in an experimental arena. Movements of beetle downwind of clean wheat, brown rice or maize or wheat infested by conspecifics, were recorded by video and analysed using motion analysis software. No differences could be detected in the responses of beetles to the odours of clean wheat or to clean air; they showed equally strong positive anemotaxis to both. On average, only 37% of beetles arrived at the three clean food sources tested while 80% were able to locate the infested wheat. Both sexes showed an orientation component (taxis) in their behaviour towards the infested food source; females turned more (klinokinesis) and walked faster (orthokinesis) while there was no difference in male velocity between the odours of clean or infested wheat. There was no evidence of response to host odours and the locomotory responses of beetles that were able to locate clean wheat were similar to those that failed to do so. Investigation of beetles in potentially different physiological states, i.e. those that had actively dispersed from a food source or females reared in an environment isolated from other insects, showed no behavioural responses to wheat volatiles. Together, these studies gave no evidence that walking *R. dominica* use host volatiles to locate cereals. To the contrary, initial host location of cereals may occur by chance, as would seem to be the case in the closely related *Prostephanus truncatus*. The implications of this for better pest management of *R. dominica* are discussed.

Keywords: locomotory behaviour, host selection, pheromones, plant volatiles, Coleoptera, Bostrichidae