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Pheromone release by *Rhyzopertha dominica* (F.) (Coleoptera: Bostrichidae) in the laboratory: daily rhythm, inter-male variation and association with body weight and/or boring activity

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Abstract

Male *Rhyzopertha dominica* release an aggregation pheromone that is a blend of two components, Dominicalure-1 (D1) and Dominicalure-2 (D2). Factors leading to variation in the output of pheromone were investigated in order to improve the design of future experimental studies. Pheromone output from male *R. dominica*, during the photophase (08.00–20.00 h), was quantified for six 2-h periods to test for any diurnal rhythms. The amounts of components released were similar during the period 08.00–16.00 h but increased significantly in late afternoon (16.00–20.00 h). Measurements were also made of pheromone release during the whole scotophase and males were found to emit significantly less at this time but the D1:D2 ratio remained relatively constant at 1:1. Mean daily release rates for D1 and D2 were 1.22 and 1.09 μg, respectively for 8–9 day old males. Actual quantities of pheromone components varied 10-fold among individuals, but the blend composition was relatively constant with the mean proportion of D1 in the blend being 51.4% although extremes of 35.1–71.3% were recorded. Both body weight and boring rate were positively correlated with rates of pheromone release, although body weight and boring rate were themselves correlated. The blend ratio did not vary with body weight or boring rate. If experimenting on release of, or behavioural responses to, pheromone, then variation in output can be minimised by choosing males of similar body weight and by restricting study to times of the day when release rates would be expected to be most similar.

Keywords: *Rhyzopertha dominica*; Pheromone; Daily rhythm; Individual variation

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