Repellent Effect of the Plants Lavender and Caraway on the Migration of Rhyzopertha dominica F populations (Coleoptera: Bostrichidae)

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The effect of the powdered plants – lavender flowers Lavandula officinalis L and caraway fruits Carum carvi L on the migrating activity of the lesser grain borer Rhyzopertha dominica (Fabricius 1792) was investigated. The experiments were conducted in the laboratory in the temperature of 28 °C, 60 ± 5 % RH. In the conditions enabling migration of adult individuals of R dominica, addition to wheat grains lavender or caraway containing essential oils caused high emigration of the pests from the substrate with these plants added. Both the plants have a repelling effect on R dominica, especially in the initial period of infesting the substrate. It was then that a particularly strong repelling effect of lavender was observed: during the 100 days of the experiments emigration was 90–100 %. Application of caraway in the first 70 days of the experiments resulted in 80–95 % emigration. Moreover, lavender causes higher mortality of insects.

Key words: Rhyzopertha dominica (Fabricius 1792) – Carum carvi – Lavandula officinalis – migration activity – mortality – population dynamics – repellent

1 Introduction

The spreading of insects, which are pests for stored grains and food products, takes place through a trade exchange of goods in intercontinental communication and migration of these species. It is a serious problem in the world’s scale because of the immense economic losses resulting from destroying food by these insects with no possibility to apply insecticides, which are commonly used to control pests, in their habitats. The scales of the losses depend to a large extent on the intensity of population processes, which is characteristic for particular species and especially on the nutritional and migrational activity of these species [RAO & WILBUR 1972, CIESIELSKA & KŁYŚ 2002, KŁYŚ 2008b]. At present, particular attention is given to the possibility of using plants and minerals as traditional protective agents for stored products, as well as to an alternative for long-term, non-decomposable synthetic chemical agents which are a threat to people and which require considerable financial outlays. More and more studies concern natural repellents, attractants and antifeedants [SHARABY 1989, IGNATOWICZ & WESOŁOWSKA 1994, TUNC et al 2000, KŁYŚ 2004, 2006, KOONA & NJIOYA 2004, GERMINARA, ROTUNDO & CRISTOFARO 2007]. It seems to be essential to know the migrational activity of the population of particular species, especially of the pests of stored grains and food products and examine the behaviour of granary insects under conditions of migration with the application of natural powdered plants.