Insecticidal and repellent effects of essential oils from different parts of Achillea millefolium against adult of Oryzaephilus surinamensis L. (Coleoptera, Silvanidae)

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ABSTRACT

The high damage of storage pests and the adverse effects of chemical pesticides have made the use of plant compounds as one of the best ways to control pests. However, there are still limitations such as low competitiveness for plant insecticides such as essential oils and extracts. In this study, lethal and repellency effects of the essential oils of flowers, leaves, stems and roots of Achillea millefolium on the adult of Oryzaephilus surinamensis L. All of the bioassay experiments were conducted at temperature 28±1 0C, humidity of 65±5% and under darkness. The experiments were conducted under the randomized block design with five repetitions, each being conducted separately during 48 hours. The results of the study indicated that Achillea millefolium flower had highest lethal effect on adult of the pest in fumigant (LC50 = 14/3 µL/ml) and contact toxicities (LC50 = 8/9 µL/ml) and other parts of the plant (leaf, stem and root) had, respectively, the least lethal effect on the underlying pest. The repellency effect of the plant’s flower, leaf, stem and root was investigated on the insect using tube-Y olfactometer device. The experiment was conducted with five repetitions and each repetition was conducted with 20 insects. Results obtained from variance analysis of the data related to repellency effect of the studied extracts indicated that compared to other three extracts, flower extract of Achillea millefolium at lower concentration can repel adults of Oryzaephilus Surinamensis L. and turns to be a strong repellent.

Key words: Oryzaephilus Surinamensis, Achillea millefolium, Insecticidal effects, Repellent effects

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