damage, such as weight loss, frass production, and presence of insect-damaged kernels, should also be done as well. **8.**

7. Acknowledgements

Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the U.S. Department of Agriculture. The US Department of Agriculture is an equal opportunity provider and employer**.**

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Comparative efficacy of spinetoram, chlorfenapyr, cypermethrin, beta-cyfluthrin against *Tribolium castaneum* (Herbst) and *Trogoderma granarium* (Everts)

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Post-harvesting losses is a critical component for filling the demands of ever increasing population. Because a large number of food security issues can be facing in the future. Current study was planned to probe the comparative insecticidal, growth inhibitory and feeding detterent activities of spinetoram, chlorfenapyr, cypermethrin and beta-cyfluthrin against *Trogoderma granarium* (Everts) and *Tribolium castaneum* (Herbst) under laboratory conditions. The insecticides were used at three different concentrations i.e., 5, 7 and 9ppm. Results revealed that maximum adult mean percent mortality of *T. castaneum* was recorded at highest concentration (9ppm) was 78.08% followed by 69.41% at 7ppm and 61.41% at 5ppm. In case of *T. granarium* at highest concentration (9ppm) the mortality was 72.58% followed by 64.08% at 7ppm and 55.33% at 5ppm. Results regarding growth inhibition showed that cypermethrin and chlorfenapyr gave highest values 28.77 and 23.78% for larval emergence inhibition. While beta-cyfluthrin gave lowest larval emergence inhibition against the *T. castaneum*, beta cyfluthrin gave 53.02% pupae inhibition. 50.26%, 48.66% and 46.48% pupae inhibition values were given by spinetoram, chlorfenapyr and cypermethrin, respectively. Adult emergence inhibition was highest 40.17% in case of cypermethrin followed by chlorfenapyr (30.60%). Similarly, the efficacy of all tested insecticides in term of feeding deterrence for both insects was cypermethrin > chlorfenapyr > spinetoram > beta-cyfluthrin.

Toxicity of four Cuban botanical derivatives against two stored-products coleopteran pests

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Abstract

Plants are a source of substances for protection of stored products. The Cuban flora has not yet been fully studied as a source of pesticides for postharvest protection, partly due to its great diversity. The toxicity of four Cuban plant derivatives against *Lasioderma serricorne* (F.) and *Sitophilus zeamais* Motschulsky was investigated. The anti-insect activity of the powders and the essential oil from plants belonging to Asteraceae, Fabaceae and Piperaceae was tested. Mortality and emergence of adult insects and the repellent effect of products were evaluated. Two products derived from *Piper aduncum* subsp. *ossanum*, caused high mortality (81,6 and 100%), reduced emergence (27,9 and 0,4%) and exhibited strong repellent activity on *L. serricorne*. Against *S. zeamais*, treatments with the highest mortality values were stems of *Lonchocarpus punctatus* (72,4%), seeds and stems of *Canavalia ensiformis* (64,9 and 69,9%), and leaves of *Tithonia diversifolia* (67,2%). The progeny production of *S. zeamais* was inhibited by powders of *L. punctatus* stems (31,8%), *C. ensiformis* seeds (40,5%), leaves (43,7%) and stems (30,6%), and *T. diversifolia* leaves (38,7%). The stems of *C. ensiformis*, leaves of *T. diversifolia* and *L. punctatus* had the highest repellent effect. These products have potential for small-scale treatments of grains for protection against both insects, and *P. aduncum* subsp. *ossanum*-based products to control *L. serricorne* infestation in tobacco. Identification of local candidates to develop effective and safe pesticides offers new alternatives to the Cuban agriculture in the control of storage pests.

Keywords: *Lasioderma serricorne*, *Sitophilus zeamais*, Fabaceae, Asteraceae, Piperaceae.

Introduction

Stored products of agricultural and animal origin are attacked by many species of insect pests causing quantitative and qualitative losses and insect contamination in food commodities is an important quality control problem of concern for food industries (Rajendran and Sriranjini, 2008). Storage insects cause significant losses for grain and legume producers, due to the reduction of the quantity and quality of food for domestic consumption and the value of the grain for sale in the