

Title Integrated management of insect vectors of *Aspergillus flavus* in stored maize, using synthetic antioxidants and natural phytochemicals

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Abstract

The purpose of this study was to investigate the insecticidal activity of two benzoic acids 2(3)-*tert*-butyl-4 hydroxyanisole (BHA) and 2,6-di(*tert*-butyl)-*p*-cresol (BHT); two phenolic acids 3-phenyl-2-propenoic acid (CA) and *trans*-4-hydroxy-3-methoxycinnamic acid (FA) and two essential oils of *Eugenia caryophyllata* (clove tree) and *Thymus vulgaris* (thyme) against *Sitophilus zeamais*, *Tribolium confusum* and *Rhyzopertha dominica*, vector carriers of aflatoxigenic fungi in stored maize. The susceptibility of insects, the frequency of isolation of *Aspergillus* section *Flavi* in insects and maize, and the analysis of aflatoxin B₁ in maize were determined. BHA, BHT, BHA/BHT mixture and the natural phytochemicals AF and AF/AC mixture showed the highest insecticidal activity against *S. zeamais*, *T. confusum* and *R. dominica* after 120 days of incubation. The insecticidal efficacy of the volatile fraction of essential oils of clove and thyme showed less inhibition. There was no contamination of *Aspergillus* section *Flavi* in dead and live insects collected from maize treated with BHA. No aflatoxin B₁ accumulation was detected in the control and treatments. The information obtained shows that these substances have the potential to control pest insect vectors of aflatoxigenic fungi in stored maize in microcosms during 120 days.