

Title Impact of cinnamon oil-enrichment on microbial spoilage of fresh produce
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Abstract

Cinnamon (*Cinnamomum zeylanicum* L.) oil (ranging between 25 and 500 ppm) was tested for antifungal activity against *Colletotrichum coccodes*, *Botrytis cinerea*, *Cladosporium herbarum*, *Rhizopus stolonifer* and *Aspergillus niger in vitro*. Oil-enrichment resulted in significant ($P < 0.05$) reduction on subsequent colony development for the examined pathogens. Fungal spore production inhibited up to 63% at 25 ppm of cinnamon oil concentration when compared with equivalent plates stored in ambient air. In the highest oil concentration (500 ppm) employed, fungal sporulation (except for *B. cinerea*) was completely retarded. *In vitro*, cinnamon oil reduced spore germination and germ tube length in *C. coccodes*, *B. cinerea*, *C. herbarum* and *R. stolonifer* with the effects were dependent on oil concentration. However, cinnamon oil (up to 100 ppm) accelerated spore germination for *A. niger*. Wound-inoculated pepper fruit accelerated *B. cinerea* and *C. coccodes* development following 3 days vapour exposure to cinnamon, and this effect was not persisted for longer exposure but no differences observed for tomatofruit. Pre-exposing tomatofruit to 500 ppm cinnamon vapours for 3 days, and then inoculated with fungi, reduced *B. cinerea* and *C. coccodes* lesion development. At the present, trials is currently focussing on the mechanisms underlying the impacts of essential oil volatiles on disease development with a major contribution to limiting the spread of the pathogen by lowering the spore load in the storage/transit atmospheres as well as the use of essential oil as an alternative food preservative.