

Title Fungitoxicity of the essential oil of *Citrus sinensis* on post-harvest pathogens
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Abstract

The essential oil extracted from the epicarp of *Citrus sinensis* exhibited absolute fungitoxicity against the 10 post-harvest pathogens. GC–MS studies of the oil revealed the presence of 10 chemical constituents, of which limonene was found to be the major component (84.2%). The activity of the oil was tested by the poisoned food technique (PF) and the volatile activity (VA) assay and the oils showed greater toxicity in the VA assay than in the poisoned food assay. The nature of the toxicity was studied in the VA assay and it was observed that the oil was fungicidal for the 10 pathogens in the 700 ppm (mg/l) to 1000 ppm range. The oil was extremely toxic for spore germination and it was found that at 700 ppm, spore germination was inhibited in the 10 test fungi out of the 12 tested. Treatment at 300 ppm concentration exhibited 70–100% inhibition of spore germination in most of the fungi tested. Scanning electron microscopy (SEM) was done to study the mode of action of the oil in *Aspergillus niger* and it was observed that treatment with the oil leads to distortion and thinning of the hyphal wall and the reduction in hyphal diameter and absence of conidiophores.