

Title Ethanol, vinegar and *Origanum vulgare* oil vapour suppress the development of anthracnose rot in tomato fruit

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Abstract

Anthracnose rot (*Colletotrichum coccodes*) development *in vitro* or in tomato (*Lycopersicon esculentum* L.) fruit was evaluated after treatment with absolute ethyl alcohol (AEA), vinegar (VIN), chlorine (CHL) or origanum oil (ORI) and storage at 12 °C and 95% relative humidity during or following exposure to the volatiles. Fruit treated with vapours reduced fungal spore germination/production, but in the case of AEA- and VIN-treated fruits, fungal mycelium development was accelerated. Fruit lesion development was suppressed after fruit exposure to pure (100% v/v) AEA or ORI vapours which were accompanied by increased fruit cracking. Exposure to pure VIN-, CHL- and ORI vapours reduced (up to 92%) spore germination *in vitro*, but no differences were observed in the AEA treatment. The benefits associated with volatiles-enrichment were maintained in fruit pre-exposed to vapours, resulting in suppression in spore germination and spore production. However, studies performed on fungi grown on Potato Dextrose Agar revealed fewer direct effects of volatiles on fungal colony development and spore germination *per se*, implying that suppression of pathogen development was due in a large part to the impact of volatiles on fruit-pathogen interactions and/or ‘memory’ effects on fruit tissue. Work is currently focussing on the mechanisms underlying the impacts of volatiles on fruit quality related attributes. The results of this study indicate that volatiles may be considered as an alternative to the traditional postharvest sanitizing techniques. Each commodity needs to be individually assessed, and the volatile concentration and sanitising technique optimised, before the volatile treatment is used commercially.