Impact of Peroxsil® on *(Alternaria spp.)* Black heart rot

IN VITRO STUDY RESULTS

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Silver as an Effective Disinfectant:
Silver possesses natural antimicrobial properties due to its ions binding to the DNA of viruses, fungi and bacteria, preventing their replication. When combined with (unstable) hydrogen peroxide, which corrodes cell walls, silver forms a stable product with dual action. This results in a highly effective disinfectant that is not only biodegradable but also eco-friendly.

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Type of Presentation: Abstract

Introduction:

Alternaria alternata and Alternaria arborescens have been reported worldwide as some of the most devastating postharvest pathogens of pomegranate, causing black spot and heart rot, which eventually results in desiccated fruit. A survey of postharvest decay on pomegranates (2015-2016) in six South African production areas, *Alternaria spp*. was the most frequently isolated pathogen, which was identified in 12 out of 27 locations, such as orchards in Mpumalanga (Komatipoort), Northern Cape (Springbok), and the Western Cape (Koue Bokkeveld, Paarl, Ladismith, Oudtshoorn, and other regions). Alternaria control currently relies on orchard application of synthetic fungicides during bloom, but efficacy has not been reported for South African isolates and alternative products are being investigated in response to grower demand.

Materials and Methods:

An in vitro study, was conducted to test South African isolates of A. alternata (from pomegranate) and A. arborescens (from apple) for sensitivity to the conventional fungicide difenoconazole, and one alternative antimicrobial agent (Silver-ions; Peroxsil® Ag+). Mycelial growth inhibition as well as spore germination inhibition, were tested.

Black Heart Rot:

(Photo courtesy of Dr. Themis Michailides, University of California)

Results:

Difenoconazole effectively inhibited Alternaria alternata at a concentration of 0.01 mg/L by 50% but was less effective with all tested isolates growing at 1 mg/L (growth inhibition of A. arborescens between 76-96 %). Silver ions were highly effective in inhibiting spore germination of A. alternata (43% less spore germination) at a 1:10 dilution and A. arborescens even at the lowest tested dose (diluted 1:10,000,000; 1 x 10-6).

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Conclusion:

Silver ions have shown high efficacy in vitro against the pomegranate pathogens such as *Alternaria spp.*, which should be tested in orchard trials at 75% petal drop to verify their efficacy in direct comparison to conventional fungicides fluopyram and difenoconazole.

References:

Images: Department of Soil, Plant, and Food Sciences, University of Bari Aldo Moro, and the University of California.

Images from - Postharvest Rot of Pomegranate Fruit in Southern Italy: Characterization of the Main Pathogens
by Annamaria Mincuzzi, Simona Marianna Sanzani, Lluís Palou, Marco Ragni, and Antonio Ippolito.
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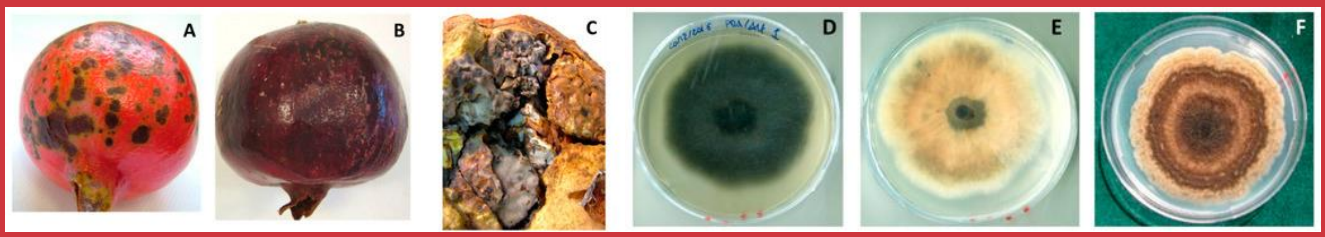
Infected Fruit



(A) Black spot and (B) black heart caused by *Alternaria spp.* (C) Close-up on heart rot showing mycelium growth. Colonies on PDA of Alternaria alternata: (D) dark and (E) whitish strains. (F) Colony of Alternaria arborescens on PDA.

Healthy Fruit

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