



# Program and Book of Abstracts

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for managing postharvest pathogens

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### Evaluation of hot water and GRAS salt solutions for the control of postharvest gray and green molds of pomegranate fruit

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#### Abstract

Gray and green molds, caused by the fungi *Botrytis cinerea* and *Penicillium* spp., respectively, are among the most important postharvest diseases of pomegranate fruit in Spain. Although the synthetic fungicide fludioxonil is allowed for postharvest use since 2019, disease control methods alternative to agrochemicals are preferred, especially in pomegranate export markets, due to health and environmental issues associated with chemical residues. In this work, the disease control ability of dips in hot water (20, 40, 50, 55, 60, 65, 70, and 75 °C) or aqueous solutions of GRAS (generally recognized as safe) salts (PS, potassium sorbate; SC, sodium carbonate; SBC, sodium bicarbonate; SB, sodium benzoate; all at 3% (w/v)) was evaluated using 'Mollar de Elche' pomegranates artificially inoculated with the pathogens *B. cinerea* or *P. sclerotiorum*. Hot water dips at 50 °C or higher for 2.5 min significantly reduced green mold after 7 days of incubation at 20°C, but dips at 55 °C or higher were phytotoxic causing heat injury on treated fruit (external rind browning). Although 3-min dips at 20 °C in some GRAS solutions reduced the incidence and severity of both gray and green molds after 14 days of incubation at 20 °C, these treatments were not persistent and disease reductions were not significant after 21 days. Moreover, SC and SBC dips were phytotoxic, causing external darkening and blackening of fruit crowns and areas surrounding rind wounds. In a further experiment, 3-min dips in hot water at 50 °C or 3% PS at 20 or 50 °C significantly reduced the incidence of gray mold with respect to control fruit (dips in water at 20°C), but the most effective treatments (dips at 50 °C) were phytotoxic. Overall, due to reduced efficacy and high phytotoxicity risks, hot water and the assayed GRAS salt treatments cannot be recommended for inclusion in strategies for nonpolluting integrated control of postharvest diseases of 'Mollar de Elche' pomegranates.

**Keywords:** *Punica granatum*, *Botrytis cinerea*, *Penicillium sclerotiorum*, postharvest decay control, heat, GRAS compounds, heated solutions

