PRELIMINARY EVALUATION OF POMEGRANATE PEEL EXTRACTS FOR THE CONTROL OF POSTHARVEST BROWN AND SOUR ROTS OF NECTARINES

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INTRODUCTION

Significant economic losses of stone fruits are caused worldwide by postharvest brown and sour rots, caused by the fungi *Monilinia* spp. and *Geotrichum candidum,* respectively. Strategies alternative to synthetic chemical fungicides are needed for non-polluting disease control. Pomegranate (*Punica granatum* L.) peel extracts have been reported to provide antimicrobial activity, mainly attributed to their high polyphenol content.

OBJECTIVE

Preliminary evaluation of two previously selected extracts from 'Mollar de Elche' pomegranates (methanolic PPE and aqueous PPE) for the control of brown and sour rots on nectarines cvs. Big Bang and Ambra, wound-inoculated 24 h before with *M. fructicola* and *G. candidum*, respectively, and incubated at 20ºC.

MATERIALS AND METHODS

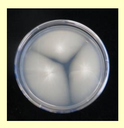
'Ambra' and 'Big Bang' nectarines

- Direct from field
- No postharvest treatments applied

Selection, disinfection, and random distribution

Artificial inoculation

***M. fructicola*:** 10^3 **conidia/mL**

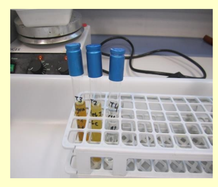


***G. candidum*:** 10^6 **conidia /mL**

POMEGRANATE PEEL EXTRACT APPLICATION

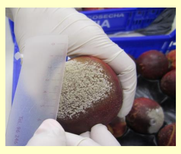
- ❑ AQUEOUS PPE
- ❑ METHANOLIC PPE

- **24 h after inoculation (CURATIVE ACTIVITY)**
- **30 µl on each pathogen inoculation point**
- **30 g/L**



Incubation
Up to 7 days at 20ºC

EVALUATION OF BROWN ROT AND SOUR ROT CONTROL BY PPE

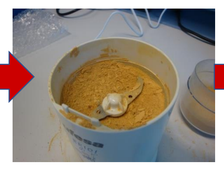


- **Incidence (% infected wounds)**
- **Severity (diameter of lesions)**

POMEGRANATE PEEL EXTRACTS ELABORATION

Pomegranates cv. Mollar de Elche

Drying of peels (55ºC)



Grinding

Double extraction

Aqueous extraction

Centrifugation

Vacuum filtration

AQUEOUS-PPE

Methanolic extraction

Vacuum filtration

Vacuum drying

Dry residue resuspension in water

METHANOLIC-PPE

RESULTS

1. BROWN ROT (*Monilinia fructicola*)

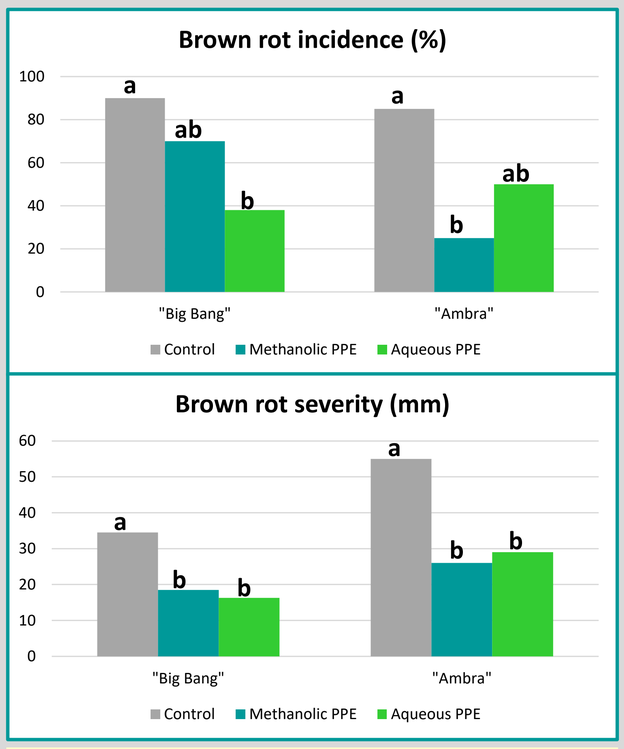


Figure 1. **Brown rot incidence and severity on nectarines artificially inoculated with *M. fructicola,* treated 24 h later with pomegranate peel extracts (PPE, 30 g/L) and incubated at 20ºC for 4 days. ANOVA and LSD test ($P < 0.05$).**

Photo 1. **Brown rot on nectarines cv. Ambra treated with water (control, top); methanolic PPE (middle), and aqueous PPE (bottom) after incubation at 20ºC for 6 days.**

2. SOUR ROT (*Geotrichum candidum*)

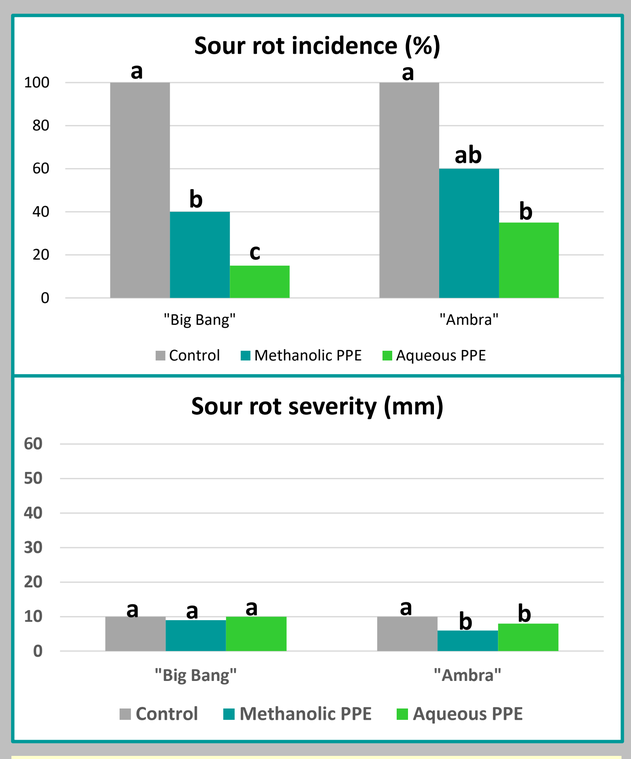


Figure 2. **Sour rot incidence and severity on nectarines artificially inoculated with *G. candidum,* treated 24 h later with pomegranate peel extracts (PPE, 30 g/L) and incubated at 20ºC for 4 days. ANOVA and LSD test ($P < 0.05$).**

Photo 2. **Sour rot on nectarines cv. Big Bang treated with water (control, top), methanolic PPE (middle), and aqueous PPE (bottom) after incubation at 20ºC for 6 days.**

CONCLUSIONS

- ❑ **Application of both aqueous and methanolic PPE (30 g/L) significantly reduced the development of both brown and sour rot after 4 days of incubation, showing potential as an alternative non-polluting control mean.**
- ❑ **Effectiveness was lower after longer incubation periods. Curative activity was not very persistent.**

AKNOWLEDGEMENTS

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