Biocontrol potential of non-*Saccharomyces* yeasts against *Botrytis cinerea*

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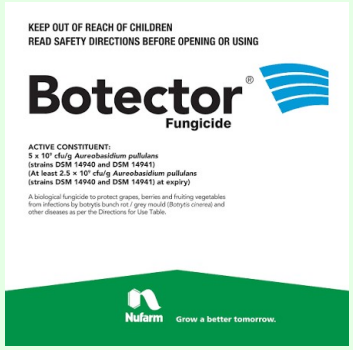
Introduction

- Table grapes economic important crop
- Grey mould/rot caused by *Botrytis cinerea,* reduces yield and quality
- Synthetic fungicides used for controlling disease
- Chemical pesticides reduction: focus on sustainable use, reduce risks and impact on human health and the environment



Introduction (Cont.)

- Yeasts are generally regarded as safe (GRAS) for humans and animals, do not produce mycotoxins or allergenic spores, and do not leave harmful residues on the fruit or in the environment.
- Commercial products (*Aureobasidium pullulans, Candida oleophila, Metschnikowia fructicola, M. pulcherrima*)









Aim

- **To determine the growth inhibition activity of four non-*Saccharomyces* yeasts against different *Botrytis cinerea* isolates and possible use as biocontrol agents**

Materials and methods

- Yeasts: *Meyerozyma guilliermondii, Pichia kluyveri, Suhomyces pyralidae, Zygoascus hellenicus*
- *Botrytis cinerea* isolates (B05.10, SAGWRI-FF1, PPRI 30807)
- Cultured on yeast malt agar (YMA) and YM broth at 28°C
- Fungicide: 0.5 g/L Captan™ (N-trichloromethylthio-4-cyclohexene-1,2-dicarboximide)

Mould spore germination

Control plate

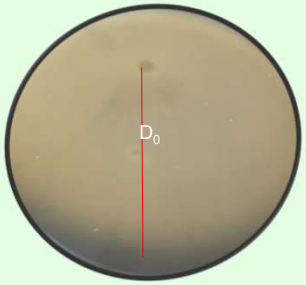


Yeast spread plate

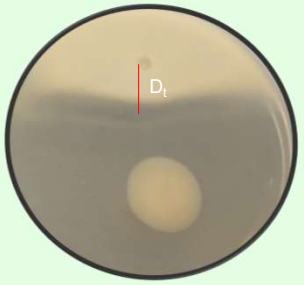


Dual culture assay

Control plate

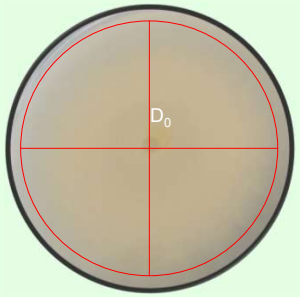


Yeast spotted plate



Volatile organic compounds

Control plate



Yeast treated plate

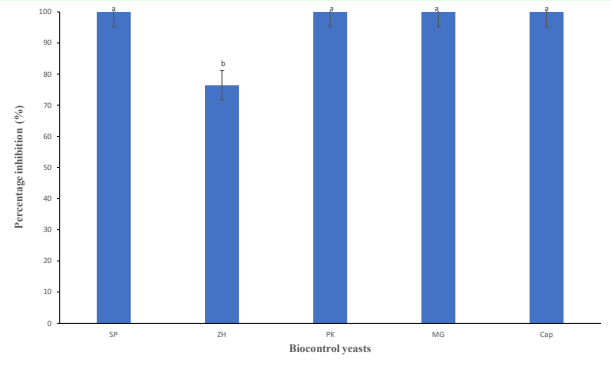


Inhibition %: [(D0 − Dt)/D0] × 100, D0 = mould growth on negative control plates and Dt = mould growth on treated plate

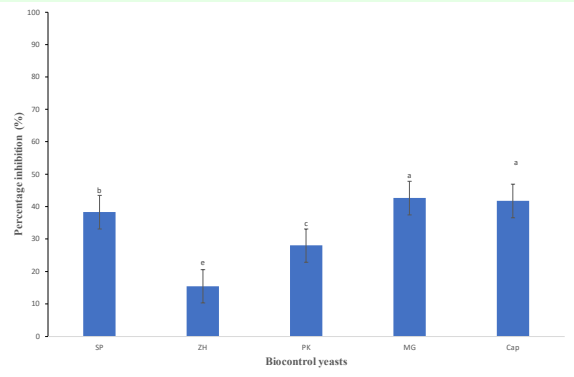
Results

- Spore germination assay*: M. guilliermondii* and *P. kluyveri, S. pyralidae* 100% inhibition
- Dual culture assay: Variable inhibition (15-42%)
- VOC assay: Variable inhibition (47-76%)

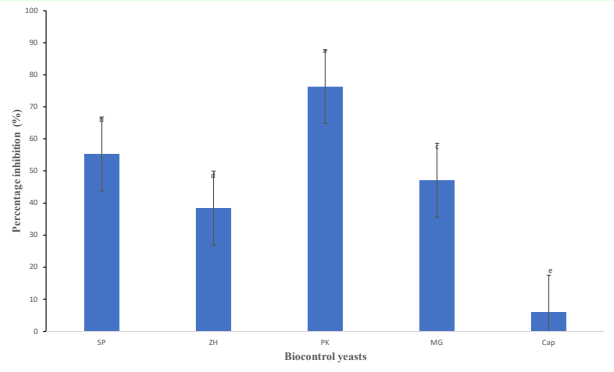
Spore germination assay



Dual assay



Volatile organic compound assay



Grape trial results

- **100%** inhibition



Conclusions

- Yeast controlled the spore germination and mycelia growth, strain variability
- Yeasts were comparable to commercial fungicide
- Potential as alternative to chemical fungicides

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Thank you!