

## Use of *non-Saccharomyces* Yeasts as Biological Control Agents Against *Botrytis Cinerea*

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### Abstract

Apples and strawberries are a major source of essential growth factors such as vitamins and minerals required for a healthy living. Fruits fail to enter both local and export markets due to spoilage and disease. The use of *non-Saccharomyces* yeasts as biological control agents in crop protection is considered as a promising alternative to synthetic chemicals, due to their effectiveness in controlling pre- and post-harvest mould disease and low environmental impact. The aim of the study was to determine the growth inhibition activity of selected yeasts against *Botrytis cinerea*. Five yeasts (*Aureobasidium melanogenum*, *Candida pyralidae*, *Meyerozyma guilliermondii*, *Pichia kluyveri* and *Zygoascus helenicus*) were screened for growth inhibition activity against three *B. cinerea* strains on agar plates and during post-harvest apple and strawberry trials. On yeast mould agar, *Aureobasidium melanogenum* showed the best growth inhibition against all three *B. cinerea* strains, with 55%, 52% and 40% inhibition against *B. cinerea* 1, 2 and 3, respectively. *Candida pyralidae* was the second-best performing yeast strain by showing 56%, 38%, and 35% inhibition against *B. cinerea* 1, 2 and 3, respectively, while a commercial fungicide (Captan) showed 57%, 41% and 34% inhibition, respectively. Using the volatile organic compound assay, *Pichia kluyveri* and *C. pyralidae* achieved 79% and 56% growth inhibition activity, respectively, against all three moulds. On apples, Captan performed the best, with 92%, 49% and 17% inhibition activity against *B. cinerea* 1, 2, and 3, respectively. *C. pyralidae* was the best performing yeast, with 64%, 40%, and 25% inhibition against *B. cinerea* 1, 2 and 3, respectively. *A. melanogenum* showed 31%, 24% and 27% inhibition against *B. cinerea* 1, 2 and 3, respectively. On strawberries, Captan and *C. pyralidae* showed 100% inhibition against *B. cinerea* 1, while Captan and *P. kluyveri* also achieved 100% inhibition against *B. cinerea* 2. All treatments showed low levels of inhibition (22%) against *B. cinerea* 3. The selected yeast species demonstrated potential as biological control agents against *B. cinerea*, but more research is needed.

### PRESENTER BIOGRAPHY: ZUKISANI GOMOMO

Zukisani Gomomo was born in Fort Beaufort in the Eastern Cape. Zukisani attended Fort Beaufort Primary School and thereafter went to Thubalethu High School. Zukisani enrolled at Fort Cox Agriculture and Forestry Training Institute in 2015 and obtained a National Diploma in Crop Production in 2018. Zukisani then enrolled at Cape Peninsula University of Technology in 2019 and obtained a BTech in Agriculture. In the 2020, Zukisani enrolled for Master's degree in Agriculture and obtained the degree at record time in the year 2022. Currently, Zukisani currently doing a PhD in Horticulture under the topic, "Application of yeast-based biocontrol agents against fruit spoilage mould". Horticulture, which is the sub-sector of agriculture, contributes to the economy of the country, food safety and food security. Zukisani is an ambitious, hardworking, self-motivated, goal-oriented individual who is always looking for a challenge to enhance her skills and knowledge.