



## Effectiveness of Yeasts as Biological Control Agents Against Fruit Spoilage Mould

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### Abstract

Fruits are commercially and nutritionally important commodities and play a very important role in human nutrition. During pre- and post-harvest stages, considerable quantities of fresh products are lost due to fungal spoilage. Twenty-five percent of the total production of fruits in industrialised countries is lost and more than 50% losses in developing countries due to microbial spoilage. Currently, synthetic chemicals are used to control the growth and development of fungi; however, these chemical fungicides pose serious health concerns to consumers and the environment. These negative impacts posed by chemicals are fostering the search for alternatives and biological control is a promising alternative, since it is more environmentally friendly and cost-effective than synthetic chemicals. This study aimed to screen different yeasts for growth inhibition activity against fruit spoilage mould. One hundred and seven yeast isolates were screened against *Botrytis*, *Penicillium* and *Alternaria* species using radial fungal plug inhibition, dual inhibition, and the mouth-to-mouth plate inhibition assays. Three yeast strains were also evaluated for growth inhibition activity on post-harvest apple trials. Sixty-eight out of 107 yeasts showed growth inhibition activity against *Penicillium*, 47 yeasts inhibited *Alternaria*, 36 yeasts inhibited *Botrytis* and 22 yeasts showed inhibition against all three moulds using the radial fungal plug inhibition assay. One *Candida pyralidae*, two *Pichia kluyveri* and four *Meyerozyma guilliermondii* yeast strains showed good growth inhibition activity against all three moulds. Volatile organic compounds produced by *Pichia kluyveri* yeast strains exhibited growth inhibition activity, ranging from 76 to 91%, against all three moulds. On apples, *P. kluyveri* and *M. guilliermondii* strains achieved 71% and 93% growth inhibition, respectively, against *Alternaria* species. Yeast can effectively control the growth of mould, but the level of inhibition is species and strain dependent.

### Biography: Zukisani Gomomo

Zukisani Gomomo was born in Fort Beaufort in the Eastern Cape. She attended Inqaba Primary School from grade R to grade 4, then went to Fort Beaufort Primary School and thereafter to Thubalethu High School. Zukisani enrolled at Fort Cox Training Institute (King Williams Town) in 2015 and obtained my National Diploma in Crop Production in 2018. She was awarded a merit certificate (best student in crop production). Zukisani enrolled at Cape Peninsula University of Technology (Wellington Campus) in 2019 where she obtained a BTech in Agriculture (Crop Production). Currently, Zukisani is doing her master's in agriculture under the topic, "Effectiveness of Yeasts as Biological Control Agents Against Fruit Spoilage Mould". Agriculture contributes to the economy of the country and food safety and security is very

important, especially with our ever-increasing population. Zukisani is ambitious, hardworking, self-motivated, goal-oriented individual who is always looking for a challenge to enhance her skills and knowledge.