Utilization of antagonistic yeasts in grapes to control *Botrytis cinerea*

Sebahat OZTEKIN
Istanbul Technical University, Turkey

There is a growing demand for biopreservatives that are natural and eco-friendly. Accordingly, yeasts are considered to be one of the promising biocontrol agents. In addition, the use of chemical pesticides may lead to health problems by inducing resistance in the fruit microbiome, which also poses a threat to theenvironment. Therefore, in this study, *Metschnikowia* sp. (*Metschnikowia* sinensis KTMD1-4, *Metschnikowia pulcherrima* BMD3B, and *Metschnikowia* aff. *pulcherrima* P01A016) yeasts were tested on grapes to control *Botrytis cinerea* infection. For all yeasts, in vitro mycelial growth inhibition rates were found above 80 %. Additional tests (iron depletion, volatile organic compounds (VOCs), and biofilm activity) were conducted on yeasts to elucidate the inhibition mechanisms. Then, antagonistic yeasts were tested on grapes to see the biocontrol efficacy against *B. cinerea*. The findings showed that M. *pulcherrima* BMD3B had the highest iron depletion activity and biocontrol efficacy in controlling *B. cinerea*, also maintaining the integrity of the fruit cell wall. Furthermore, M. sinensis KTMD1-4 had a moderate effect in controlling *B. cinerea*. Although *Metschnikowia* aff. *pulcherrima* P01A016 displayed the highest biofilm activity (0.88 ± 0.03) and VOCs formation, it was ineffective in controlling *B. cinerea*. *Metschnikowia* yeasts prolonged the shelf life of grapes by reducing the disease incidence and lesion diameters compared *Metschnikowia pulcherrima* BMD3B, and *Metschnikowia* aff. *pulcherrima* P01A016) yeasts were tested on grapes to control *Botrytis cinerea* infection. For all yeasts, in vitro mycelial growth inhibition rates were found above 80 %. Additional tests (iron depletion, volatile organic compounds (VOCs), and biofilm activity) were conducted on yeasts to elucidate the inhibition mechanisms. Then, antagonistic yeasts were tested on grapes to see the biocontrol efficacy against *B. cinerea*. The findings showed that M. *pulcherrima* BMD3B had the highest iron depletion activity and biocontrol efficacy in controlling *B. cinerea*, also maintaining the integrity of the fruit cell wall. Furthermore, M. sinensis KTMD1-4 had a moderate effect in controlling *B. cinerea*. Although *Metschnikowia* aff. *pulcherrima* P01A016 displayed the highest biofilm activity (0.88 ± 0.03) and VOCs formation, it was ineffective in controlling *B. cinerea*. *Metschnikowia* yeasts prolonged the shelf life of grapes by reducing the disease incidence and lesion diameters compared to control. These findings could pave the way for the use of natural yeasts as an alternative to synthetic pesticides.

Biography

Sebahat OZTEKIN received her Master's degree from Istanbul Technical University in 2014. She is currently working as a research assistant in the Department of Food Engineering at the Bayburt University, Turkey and pursuing a PhD in Istanbul Technical University. She does research on mycotoxigenic fungi, antagonistic yeasts,natural antimicrobial microorganisms, food microbiology and biotechnology.

ozakca.sebahat@gmail.com