

Melaleuca alternifolia oil can delay nutrient damage of grapes caused by *Aspergillus ochraceus* through regulation of key genes and metabolites in metabolic pathways

Qingjun Kong, Jianrui Qi, Peipei An, Rongrong Deng, Jiahui Meng and Xueyan Ren

Postharvest Biology and Technology, Volume 164, June 2020, 111152

Abstract

Aspergillus ochraceus (*A. ochraceus*) infection can cause grape decay and nutritional quality loss during postharvest storage. Previous studies showed that *Melaleuca alternifolia* oil (MAO) had strong anti-fungal effects, however, research on the effects of MAO on grape metabolisms is lacking. In this study, effects of MAO on mycelial growth and OTA production of *A. ochraceus* and metabolites of grapes were studied. Results showed that MAO significantly inhibited the mycelial growth and spore germination of *A. ochraceus* with the increase of concentration. MAO reduced the accumulation of OTA by downregulating the gene of OTA biosynthesis pathway. MAO can alleviate the down-regulation of some metabolites such as sugars and polyphenols in tricarboxylic acid cycle, glycolysis pathway, pentose phosphate pathway and phenols pathway in grape berries infected by *A. ochraceus*. The results of qRT-PCR showed that the decrease of metabolites caused by *A. ochraceus* was due to the down-regulation of genes related to those metabolites biosynthesis, but MAO could delay this situation. Therefore, MAO may be used as an alternative preservative for controlling the destruction of nutritional quality of grapes caused by *A. ochraceus* after harvest.