

***Metschnikowia pulcherrima* as biocontrol agent in the production of Vin Santo**

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Bioprotection is an alternative strategy to chemical fungicides and bactericides to prevent the growth of spoilage microorganisms. Several studies demonstrated that *Metschnikowia pulcherrima* can inhibit the growth of undesirable yeasts in winemaking, without compromising the fermentation capabilities of *Saccharomyces cerevisiae*. A recent investigation at laboratory scale also proved that *M. pulcherrima* is effective in protecting grapes against fungal infections during withering in sweet wine (*passito*) production. Therefore, this study aimed to test the bioprotective capacity of some *M. pulcherrima* strains in real conditions of Vin Santo production, a Tuscan *passito* wine. The strains used in the experiment were selected from a *M. pulcherrima* indigenous strains collection isolated from social wasps found in vineyards of various DOCG areas in Tuscany. Using indigenous yeasts for bioprotection could avoid introducing exogenous microorganisms into the environment, allowing for a greater chance of success because these yeasts should have a higher fitness advantage than commercial strains. Thirty strains were tested to evaluate their antimicrobial properties against moulds and non-*Saccharomyces* yeasts, and three were selected. With the selected strains, a liquid preparation was created and dispersed on a portion of the grapes vertically hung for drying in the *vinsantaia*, the traditional ventilated room used in Vin Santo production. The microbial ecology and the chemical characteristics of grapes treated and untreated with the bioprotective preparation were described during 72 days of withering. The treated grapes showed the presence of two inoculated *M. pulcherrima* strains at concentrations of 5 log CFU/g throughout the withering period. The untreated grapes showed a mould presence 2-3 log units higher than the treated grapes, while the concentration of non-*Saccharomyces* and acetic bacteria was not significantly affected. The two strains were also found in the early fermentation phases, demonstrating a good ability to persist in the Vin Santo production process.