Poster

Fighting the climate change effect on biologically aged wines, finos and manzanillas, from the Sherry and Montilla Moriles DOP.

Ortiz Díaz, Antonio; Lara Rodríguez, Andrés; Jimenez, Juan; Garzón, Andrés

Departmento genética CABD, Ctra. de Utrera, km. 1, 41013 Montequinto, Sevilla.

Tutor académico: Garzón Villar, Andrés/ Jiménez Martínez, Juan

Keywords: flor yeast; adaptative evolution; fermentation

ABSTRACT

Motivation: The biological aging of sherry wines is a process carried out by a specialized type of yeast, Saccharomyces cerevisiae (flor yeast) which is able to form a biofilm on the wine surface called "flor". In this surface, the ethanol is oxidized to acetaldehyde by the action of alcohol dehydrogenase protecting the wine from oxidation. (Avdanina & Zghun, 2022). This biofilm is very sensitive to temperature increases, so global warming means a threat that worries wineries, as deterioration of the flor during warmer months is becoming more and more frequent, with the appearance of undesirable nuances in the wine. It is highly desirable to develop a simple and quickly method of restoring the flor of a barrel with our yeast strain when it deteriorates.

Methods: Ten samples were collected from different wine barrels. Once in the laboratory, each sample was diliuted and spread for single colonies on two different media, YPD and rose bengal. Five yeast colonies from each sample were used to identify potential differenet strains by microsatellite analysis by multiplex PCR. Once a yeast strain is chosen, in order to determine what would be the minimum concentration of yeast required to develop the flor as quickly as possible, it is grown in a 25 ml medium of 50% grape must and 50% water. When the culture is saturated, it is scaled up to 500 ml of the same ratio. This culture is used to work under aseptic conditions, and placing different amounts of culture in beakers with 540 ml of wine, obtaining different dilutions of the culture. Another culture of 50 ml (same ratio of must and water), is also scaled up to 50ml, and then divided into four cultures with different volumes, this culture will be used to reproduce the winery condictions.

Results: The microsatellite analyisis determined that all the yeast isolated were indistinguishable indicating that there is probably a single yeast flor strain colonizing the whole cellar. Moreover, our preliminary data show that after 13 days the cultures with 0,5 and 1% showed slight signs of development although with hardly any evidence of flor, meanwhile the, 0,25 and 0,125% didn't show any development signs.

Conclusions: The entire winery is poblated by the same Saccharomyces cerevisiae strain which has a slow velo de flor development. We are currently conducting further tests with several isolates of the "flor" strain to characterise in detail the "flor" formation parameters of this strain.

REFERENCES

Avdanina, D., & Zghun, A. (2022). Sherry Wines: Worldwide Production, Chemical Composition and Screening Conception for Flor Yeasts. Fermentation, 381. doi:https://doi.org/10.3390/fermentation8080381.