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Oral communication

Further insight on the use of Yeast Derivative Products as alcoholic fermentation enhancers

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Abstract

Issues that can arise during the alcoholic fermentation are frequently attributed to imbalances or deficiencies in the nutrient composition of the fermentation medium. In particular, insufficient levels of assimilable nitrogen, high ethanol concentrations and certain yeast metabolic by-products, such as short and medium-chain fatty acids, could cause fermentation issues by inhibiting yeast activity [1]. Yeast derivative products (YDPs) have been widely employed in order to minimize these issues as they could supplement assimilable nitrogen. YDPs can also detoxify the fermentation matrix by neutralizing short and medium-chain fatty acids. Previous studies indicated that YDPs could release of long-chain fatty acids, which may improve membrane transport activity in yeast cells [2]. YDPs were also used in winemaking in order to enhance the rehydration of active dry yeast (ADY), thereby improving fermentation kinetics and reducing its duration. This could be due to the release of yeast cell wall fragments containing sterols which integrates in the membranes of ADY cells, facilitating their repairment after the damages sustained during the dehydration process [3].

In this study, the impact of YDPs on alcoholic fermentation was investigated.

Trials were carried out with 6 YDPs belonging to different classes added either in must or during the rehydration of ADY. In addition, a Response surface methodology approach was performed considering 3 different musts fermented at 3 different temperatures, in the presence of 3 YDPs added at 3 concentrations. The fermentation kinetics were monitored and the resultant wines were characterized in terms of chemical parameters, color parameters, volatile compounds (VOCs) and sensory characteristics.

Results showed no relevant difference in fermentation kinetics and chemical parameters due to the YDPs addition performed both in must and during the rehydration. Similarly, increasing concentration of YDPs did not affect neither the fermentation kinetics nor the general composition. This could be probably due to adequate content of readily assimilable nitrogen of the must. However, the determination of VOCs and the sensory analysis evidenced the YDPs led to changes of volatile profile and appreciation. These aspects were influenced by the addition of YDPs in must or in pied de cuve, the concentration employed and the fermentation temperature. The interactions between these parameters should be carefully considered during the winemaking operations as they could play a relevant impact on the characteristics of the resulting wine.

References

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