

Susceptibility to the light-struck taste of sparkling wine

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The light-struck taste (LST) is a defect that can occur in white and rosé wines bottled in clear glass and exposed to visible light. This fault is caused to the development of unpleasant sulfur-like odors described as onion, garlic and cooked cabbage due to the formation of methanethiol and dimethyl disulfide. The reaction involves riboflavin (RF), a photosensitive compound that once it reaches an excited state, it needs to acquire two electrons to be completely reduced. When methionine acts as electron-donor, LST can develop. The presence of RF in wine is mainly attributable to the metabolism of *Saccharomyces cerevisiae* releasing RF during the alcoholic fermentation and after. Such activity can cause a further increase of this vitamin in sparkling wine where two fermentations occur. To the best of our knowledge, the impact of in-bottle fermentation has not investigated yet. This study aimed to monitor the release of RF during the second fermentation and the aging on yeast lees as well as the appearance of LST.

Nine base wines (6 white and 3 rosé) produced in vintage 2021 was considered in the study. The in-bottle fermentations were carried out by *S. cerevisiae* AWRI796, resulting a high RF-producer in a previous study [1], and the yeast strain used by the wineries (*S. cerevisiae* IOC18 or Lafazym) as control. Samplings were carried out every 3 months of aging on yeast lees up to 18 months. The wines were exposed to light under controlled conditions [2] before and after the disgorgement at each sampling point. RF and its coenzymes, FAD and FMN, were assessed by UPLC-FL [2] in the light-exposed samples and those stored in the dark. The tasting was performed considering descriptors associated to the sparkling wine (fruity, floral, bread crust, nuts) as well as the perception of LST or other defects.

The content of RF in the base wines ranged from 22 µg/L to 116 µg/L. In all the cases, a decrease of RF was observed in the samples collected 3 months after the inoculum independently to the presence of yeast cells which were still counted in 4 out of 9 sparkling wines up to 2×10^5 CFU/mL. The yeast may consume RF already present in wine for performing the second fermentation. Thereafter, RF increased in all the sparkling wines during the aging on yeast lees in a different extend depending on the wine resulting higher in comparison to the base wines. From the sensory perspective, the sparkling wines exposed to light before the disgorgement showed a more relevant appearance of LST and the rosé sparkling wines were more light-sensitive in comparison to the white ones. Nonetheless, the sparkling wines aged for a longer time on yeast lees resulted slightly less susceptible to the appearance of LST.

This study evidences for the first time the impact of in-bottle fermentation and aging on yeast lees on RF release and susceptibility to LST. The sparkling wine should be protected from light especially before the disgorgement with particular attention on the rosé sparkling wine.

References

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