Influence of specific inactive dry yeast treatments during grape ripening on postharvest berry skin texture parameters and phenolic compounds extractability

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Grape phenolic accumulation and ripeness are important factors for the production of quality wines. In addition, an increased berry skin thickness was seen to be correlated with higher resistance of grapes to pests (Gabler et al. 2003). Innovative vineyard practices could be aimed at the improvement of these characteristics (Villaggio et al. 2015; Portu et al. 2016; Šuklje et al. 2016).

Introductions

Phenolic extractability was evaluated on berries belonging to the most represented red classes, and on control and treated samples, according to the method described in 2015. Roe et al. (2015). Extracts were taken during 7-days skin maceration in model wine solution (2% ethanol, 50 mg/l 5,500, pH 3.20). At the end of the maceration, the skins were further extracted in a similar solution with the SO2 content increased to 2 g/l, homogenized and centrifuged, to evaluate the “non-extracted” fraction. Spectrophotometric (total anthocyanin index, proanthocyanidin and anthocyanin analysis). Di Stefano and Cavers, 1991, and HPLC (anthocyanins profile; Rolle and Guidez, 2017) analyses were carried out (n = 5).

Analysis at harvest

For white varieties, the treatment seemed to have induced a less-narrower Gaussian-shape curve. In Barbera, a shift towards lower density values was found, while Nebbiolo distribution was not affected.

No significant effect on average berry weight was found. The most composition, shown in the above table, reported no effect on sugars accumulation on white varieties, and a different trend for Barbera and Nebbiolo, with the ripeness of Nebbiolo improved. Due to the abnormal ripening shift previously seen, which might have caused by external factors, the Barbera experiment is not included in the next results; the behavior will be investigated with new trials.

Anthocyanin extractability

Antioxidant activities of flavanols. Added to the extract, 5 µg of DPPH- were added, and the antioxidant activity was evaluated (IC50, mmol/kg) with a DPPH assay. Extracts were taken during 7 –days skin maceration, in Model wine solution (2% ethanol, 50 mg/L 5,50, pH 3.20). At the end of the maceration, the skins were further extracted in a similar solution with the SO2 content increased to 2 g/L, homogenized and centrifuged, to evaluate the “non-extracted fraction.” Spectrophotometric (total anthocyanin index, proanthocyanidin and anthocyanin analysis). Di Stefano and Cavers, 1991, and HPLC (anthocyanins profile; Rolle and Guidez, 2017) analyses were carried out (n = 5).

Conclusions

The tested specific inactive dry yeast treatment enhanced the berry quality:

- The average berry skin thickness increased on Chardonnay, Cortese, and Nebbiolo.
- The trend found on Shiraz by Villarg et al. (2015) was confirmed also on the tested varieties.
- Berry anthocyanin content and extraction on Nebbiolo was found higher after a 7-days maceration, mainly for di-substituted forms. Also tannin extraction improved.
- Barbera grapes in this trial presented an abnormal shift of the berry density distribution. To understand if the behavior was caused by external factors the experiment will be repeated.
- For other varieties, further experiments could be aimed to confirm these results.

References