Innovative strategies for reducing astringency in Mandilaria wines

Karadimou, C[1]., Louki, E[2]., Gkrimpizis, T[1]., Christofi, S[1]., Theocharis, S[1]., Koundouras, S[1]., Kallithraka, S[2].

[1] Laboratory of Viticulture, School of Agriculture, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece

[2] Laboratory of Oenology and Alcoholic Drinks, Department of Food Science & Human Nutrition, Agricultural University of Athens, 75 Iera Odos, 11855 Athens, Greece

Mandilaria, a red grape variety indigenous to the Aegean Islands, is well known for its robust tannins and pronounced astringency, which can challenge the palatability and marketability of its wines. The aim of this study was the reduction of astringency in wines made exclusively from Mandilaria grapes through dehydrations practices and targeted winery applications.

The experiments were conducted across an experimental vineyard in Paros Island implementing three distinct dehydration systems: sun dehydration, grape withering under controlled conditions and extended ripening on the vine. The dehydration process was closely monitored by daily measurements of sugar content and berry weight. In parallel, at the winery phase, two interventions were tested: 20% and 30% mechanical removal of seeds during the early stages of maceration. Seed removal was conducted to minimize the extraction of seed-bound phenolics, which are primarily responsible for astringency. The impact of these practices on anthocyanin content, phenolic maturity and tannin composition was closely monitored. Chemical analyses included measurements of individual phenolic compounds and anthocyanins as well as total tannin contents. Additionally, the structural characteristics of the tannins were examined to assess any modifications resulting from the implemented techniques. Sensory evaluations of astringency were also performed to complement the chemical analyses.

The findings indicate that post-harvest dehydration techniques notably influenced quality indicators and increased grape skin weight compared to extended ripening on the vine. Among these techniques, sun dehydration emerged as particularly promising, improving phenolic ripeness and reducing the harsh tannic profile associated with Mandilaria wines. Additionally, the removal of seeds during early maceration stages had a significant effect, reducing astringent compounds while preserving the wine's structural integrity and complexity. This integrated approach, combining specific dehydration practices with selective winery interventions, appears to be a promising strategy for enhancing both the sensory appeal and consumer acceptance of Mandilaria wines.

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