

IMPACT OF HIGH TEMPERATURES ON PHENOLIC PROFILE OF BABIĆ GRAPES

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Abstract:

Context and purpose of the study – Babić is a Croatian native grapevine variety grown in the Coastal region, mainly in the Šibenik and Primošten areas, famous for high quality red wines. The region is known for its warm Mediterranean climate and karst relief. Vineyards are found on the hillsides of varying slopes and exposition usually giving low yields of exceptional quality. As a result of climate change, prolonged periods of extremely high temperatures are becoming more frequent in the last decade, and are starting to impact the grape quality. The study aims to define the impact of extremely high temperatures occurring in 2015 compared to average temperature conditions occurring in 2016 on phenolic profiles of Babić grapes.

Material and methods – The experiment was performed in Šibenik (Dalmatia, Croatia) commercial vineyard during two consecutive years, 2015 and 2016, with significant temperature differences. Research was conducted on Babić variety, grown on reclaimed Mediterranean karst land. Babić vines were cordon trained and shoots vertically positioned and were irrigated in both experimental years to compensate 50% of ET continuously through the growing season. The grape sampling followed grape ripening stages from véraison to maturity, with five sampling dates each year. Randomly chosen berries were collected for analysis of basic chemical parameters (total soluble solids- TSS, titratable acidity- TA), and for analysis of polyphenolic profiles of grape skins.

Results – The experimental years did not differ in the total annual rainfall and were close to the long-term precipitation average for the region. There was a significant difference in the appearance and duration of high temperatures. The highest temperatures in 2015 reached 38.8°C, and in 2016 reached 36.5°C. The July average temperature in 2015 was higher by 1.4°C compared to July 2016, and that difference further increased in August and was 1.9°C. Furthermore, 2015 had 11 days with a temperature higher than 36°C. The high temperature events occurred during the grape ripening stage. The polyphenolic profiles differed significantly between the two experimental years. Extremely high temperatures occurring in 2015 lowered the content of anthocyanins, flavonols and flavan-3-ols, as well as TSS and TA. High temperatures also influenced the composition of anthocyanin compounds, causing 2015 samples to have higher content of petunidin derivatives compared to other forms. This change in anthocyanin composition can alter the intensity and shade of wine color.

Keywords: Grapevine, Babić, Croatia, karst relief, high temperatures, polyphenolic compounds