EFFECT OF SHADING ON THE FLAVONOID PATHWAY DURING GRAPE BERRY RIPENING IN VITIS VINIFERA CV AGLIANICO

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Polyphenols are very important secondary metabolites in plants and they are responsible for the chemical, sensorial and nutraceutical properties of wine. Among them, anthocyanins are particularly important as they are the blue, red and purple pigments of fruits and flowers and they are responsible for the red colour of wine. Polyphenolic compounds are synthesised in the well-known flavonoid pathway.

Previous studies (Downey et al, 2004; Fujita et al. 2007; Rustioni et al, 2006) demonstrated that cluster shading significantly affects accumulation levels for anthocyanin and other main products of the flavonoid pathway, but more studies are needed to fully elucidate the effect of shading on the regulation of this pathway. For this reason we have chosen to study the response to shading in Aglianico, a red berry Vitis vinifera cultivar widely grown in Southern Italy.

The experimental vineyard was situated in Galluccio (CE) and the plants were maintained in good sanitary and agronomic condition. Ten days before veraison, a shading screen was applied to the grape bunches. Control bunches were fully exposed to sun light through leaf removal. From veraison to full maturity, samples of both shaded and control grape berry skins were collected and frozen in liquid nitrogen. Whole berries samples where collected and stored at -20°C for technological and chemical assays. Samples were collected in triplicate.

The maturation pattern of the whole berries were evaluated measuring soluble solids, pH and titrable acidity. We also measured total polyphenols, total flavonoids, non anthocyanin flavonoids, tannins, and total anthocyanins by spectrophotometry. The anthocyanin profiling was carried out with HPLC.

Total RNA was extracted from berry skins and the transcription levels of the key genes of the flavonoid pathway were determinated by Real Time PCR.