

Ultraviolet Light correlated to Wine Antioxidant Activity

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Introduction

Wines especially red ones are a rich source of antioxidants due to its content of phenolic compounds. Flavonoids and polyphenols from grapes and other fruits (e.g. strawberries) have been proposed to reduce the oxidative stress. These compounds are of interest due to their potential beneficial effects on human health. Moreover, according to literature, it has been proposed that irradiation with UV-C to wine samples may increase the antioxidant capacity of these. In this work the antiradical activity (A_{AR}) in Greek varietal red wines (which was evaluated using the DPPH free radical method).

Experimental

Different brands of red Greek wines were offered from Greek wine producers. An aliquot of 0.025 ml of wine sample (which was irradiated for 20 minutes at 350 nm wavelength) was added to 0.975 ml of DPPH solution (60 μ M in MeOH) vortexed and the absorbance was read at $t = 0$ and $t = 30$ min using a Spectrophotometer (wavelength 515 nm). Results were expressed using the following equation:

$$A_{AR} = 0.018 \times \% \Delta A_{515} + 0.017 \quad \text{where } \% \Delta A_{515} = \left[\frac{A_{515(0)} - A_{515(30)}}{A_{515(0)}} \right] \times 100$$

Conclusions

From our experiments an increase in the antiradical activity of wines investigated was observed. We can conclude that the amount of antiradical activity (A_{AR}) in red wines samples after radiation is approximately 2 times higher than the initial. These changes could be correlated to wavelengths of 350 nm which is most commonly in producing light-strike reactions.

One of the key steps of improving the quality of wines is aging in oak barrels or bottles. However, antioxidant properties of wines can be greatly affected during storage. According to literature aging leads to reduction of antioxidant activity of wines. So, in order to combine wine flavor – quality with high number of antioxidants we can radiate wine sample after aging and before consumption.

References

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