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Kosović, Ema
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Stability Testing of Active Substances from Wine Waste Determined by HPLC-MS

Student: Ing. Ema Kosović

Supervisor: doc. Ing. David Sýkora Ph. D.

Supervising Expert: Ing. Petra Cuřínová Ph. D.

Wine waste formed during wine production can comprise valuable bioactive substances e. g., resveratrol and viniferin, important in food production and very useful in various branches of science thanks to their potential antioxidant activity¹. To obtain usable amount of those stilbenes it is essential to use an effective extraction method. Considering that, a comparison of several different extraction methods (maceration, ultrasonic extraction, Soxhlet and pressured liquid extraction) has been performed. The most noticeable results were obtained using maceration as an extraction method in dark and Soxhlet extraction method at atmospheric pressure. These methods provide the highest concentration of resveratrol. The effects of conditions used during extraction was studied also in stability studies, which were performed for better understanding to obtained results. For these studies, newly developed HPLC-MS method which is proved to be accurate, reproducible and efficient for determination of resveratrol and viniferin, was developed. To perform the stability study, we have focused at few external factors: light, temperature and time stability. The outcome showed, that storage in dark didn't affect the concentration of monitored compounds but light exposure induced visible decreasing in resveratrol and *trans*-viniferin concentration while the concentration of *cis*-viniferin increased considerably. The explanation of this phenomenon lies in a possible dimerization of two molecules of resveratrol induced by light and also photoisomerisation of *trans* form of stilbenes into *cis*, resulting in observable concentration increase of *cis*-viniferin². To confirm this hypothesis, the sample without *cis*-viniferin was exposed to sunlight and UV light for defined time intervals. Process of formation of *cis*-viniferin was confirmed as well as supposed distinction between sunlight and UV light – UV light accelerates the entire process. Already known fact that higher temperature leads to degradation of stilbenes was also confirmed. Nevertheless, the short-time exposure of plant material to heating in solution enhances the release of resveratrol from other plant structures, such as carbohydrates.

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References

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2. Szewczuk, L. M.; Lee, S. H.; Blair, I. A.; Penning, T. M., Viniferin formation by COX1: evidence for radical intermediates during co-oxidation of resveratrol. *J. Nat. Prod.* **2005**, *68* (1), 36–42.