# Extraction of Stilbenes from Wine Industry Wastes

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Wine-processing industry produces great amounts of waste such as grape cane, grape pomace or leaves. These materials are mostly used for basic applications (wooden pellets, compost or grappa), despite the fact they contain quite a high amount of biologically active polyphenols as trans-resveratrol and its oligomers viniferins, belonging to the group of stilbenes. Trans-resveratrol is known because of its antioxidant or anti-inflammatory activity [1], while trans-$\varepsilon$-viniferin, for example, exhibits anti-obese or hepatoprotective activity [2]. Maceration and Soxhlet extraction are commonly used techniques for the extraction of stilbenes, although they are time and solvent consuming.

Our work compares the efficiency of pressurized solvent extraction (PSE), supercritical fluid extraction (SFE), and Soxhlet extraction of resveratrol and two viniferins from grape cane. The chemical composition of all plant isolates was determined by HPLC. Conditions of PSE, the most efficient method for the extraction of stilbenes, were optimized. The SFE of viniferins was enabled by adding to supercritical $CO_2$ ethanol as entrainer. Even then, the SFE of highly polar viniferins was not complete. On the other hand, the combination of SFE and PSE could be used to prepare extracts of tailored mutual ratio of trans-resveratrol, r2-viniferin, and trans-e-viniferin (Fig. 1).
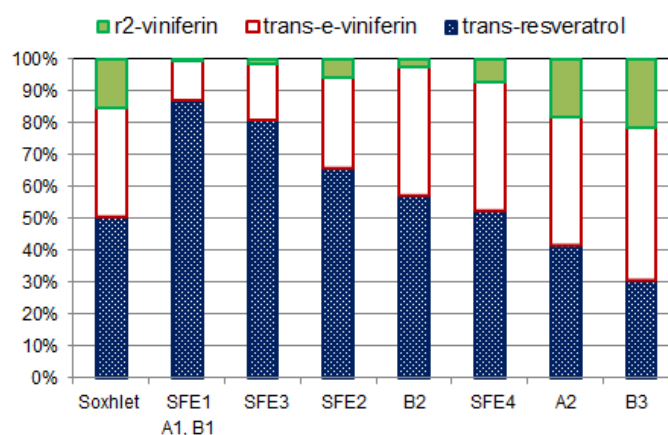


Fig. 1. Varying composition of stilbenes in extracts and their fractions obtained by Soxhlet extraction, supercritical fluid extraction and its combination with pressurized solvent extraction.

[1] Marques F.Z. et al, Int. J. Biochem. Cell Biology 41(11), 2125-2128, 2009

[2] Piver B. et al, Life Sci. 73, 1199–1213, 2003