

FRACTIONATION OF BIOLOGICALLY ACTIVE COMPONENTS FROM GRAPE SEED BY SUPERCRITICAL CARBON DIOXIDE

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Supercritical fluid extraction was applied on grape seeds (*Vitis Vinifera* L.) for fractionation of bioactive natural components as polyphenols (proanthocyanidins) and fatty acids.¹ *Vitis Vinifera* extracts have been proved to be exploitable in the preservation of food products, as well as for nutraceuticals or health supplements, due to their wide range of pharmacological action, specially their antioxidant activity.² On the other hand, pro-oxidants are reported to be promising in supplementary treatment of cancer patients. Therefore the different fractions might have different applications in the food, cosmetic or pharmaceutical industry.

A two-step process was developed, consisting of conventional alcoholic extraction followed by supercritical fluid extraction (SFE) with carbon dioxide. The effects of pressure by using pure supercritical carbon dioxide (scCO₂), as well as concentration of cosolvent (ethanol) at constant temperature and solvent to feed-ratio were mapped, and compared with different organic solvents applied in food industry. Chemical analysis of extracts and raffinates was measured by means of HPLC and Thin Layer Chromatography (only qualitatively) and the antioxidant activity was evaluated by using the DPPH* free radical scavenging assay.

The use of ethanol as entrainer enhanced the yield of the extraction at 300bar. It was observed that supercritical carbon dioxide can be used in the described process for fractionation of a grape seed alcoholic extract to obtain a product with noticeably high antioxidant activity and a second one with no antioxidant activity or pro-oxidant activity. Total extracted proanthocyanidins in supercritical CO₂ extracts increase with cosolvent percentage, while pro-oxidant activity of extracts and antioxidant activity of residues decreases.

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Key words: Supercritical Fluid Extraction; grape seed; proanthocyanidins; antioxidants; DPPH; HPLC.

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