



Fractionation of red wine polyphenols by solid-phase extraction and liquid chromatography

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Abstract

A systematic method for separation of aged red wine polyphenols into various distinct fractions using combined techniques of solid-phase extraction and liquid chromatography was proposed. The aged red wine polyphenols were separated into various distinct fractions including phenolic acid fraction, monomer flavanol fraction, oligomer procyanidin fraction, anthocyanin and its pyruvic acid derivative fraction, free or non-colored proanthocyanidin fraction, fraction of direct condensation products between anthocyanins and proanthocyanidins and fraction of other pigmented complexes. The phenolic composition of each fraction was verified by HPLC with diode array detection (HPLC-DAD), thiolysis, vanillin assay, HPLC coupled with electrospray ionization mass spectrometry (HPLC-ESI-MS) and multi-stage MS fragment analysis. For the first time, anthocyanins and their pyruvic derivatives were separated from other phenolic compounds, while free or non-pigmented polymer proanthocyanidins from other pigmented complexes. The fractionation method would be of particular interest in further studying the detailed composition of polymeric polyphenols in red wine.

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