

HPLC DETERMINATION OF TWELVE POLYPHENOLS: APPLICATION IN WINE ANALYSIS

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Abstract

Plant polyphenols have longtime attracted scientific attention thanks to their biological activities. Therefore, polyphenols identification is important part of their analysis. In this regard, an HPLC method for simultaneous identification of 12 polyphenols in wine was modified and validated.

The following validation parameters were evaluated: linearity, precision (intraday and interday repeatability), limit of detection (LoD), and limit of quantification (LoQ), recovery. The optimized high performance liquid chromatography (HPLC) method has been applied in the analyses of 12 phenolic compounds in 4 commercials and 2 homemade red wines. Solid state microextraction of wine phenolic compounds was initially carried out in order to partially purify and concentrate the target compounds.

Good linearity for all compounds within the study range was obtained (R^2 greater than 0.9990). Lowest detection and quantification limits were reported for hesperidin - 0.17 and 0.52 $\mu\text{g}/\text{mL}$ resp. and highest for gallic acid (1.5 and 4.5 $\mu\text{g}/\text{mL}$) and rutin (1.49 and 4.51 $\mu\text{g}/\text{mL}$). The percentage recovery of all polyphenols ranged from 95.9 for rutin to 100.6% for resveratrol, indicating good accuracy of the method. DL- catechin, caffeic acid and p-coumaric acid predominated in all wine samples. Meanwhile, the homemade wines were relatively poorer in phenolic compounds.

Based on the results, the validated method could be recognized as suitable for wine analysis and recommended for polyphenols identification in plant samples.

Key words: HPLC, Method validation, Plant polyphenols, Wine.