

Title Determination of phenolic compounds of grape skins during ripening by NIR spectroscopy
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Abstract

The potential of near infrared spectroscopy (NIRS) to determine the content of phenolic compounds in red grapes has been evaluated. The near infrared spectra of intact grapes and grape skins throughout maturity were recorded using a fibre-optic probe and a *transport quartz cup*, respectively. Reference values of phenolic compounds were obtained by HPLC-DAD-MS. Modified Partial Least Squares (MPLS) regression was used to develop the quantitative models for flavanols, flavonols, phenolic acids, anthocyanins and total phenolic compounds. The procedure reported here seems to have an excellent potential for fast and reasonable cost analysis. The results of this work show that the models developed using NIRS technology together with chemometric tools allow the quantification of total phenolic compounds and the families of main phenolic compounds in grape skins throughout maturation. The validation of these models showed the best results for the determination of flavonols (differences between HPLC and NIRS of 7.8% using grapes and 10.7% using grape skins) in the external validation procedure. Good results in the external validation were also obtained for the determination of total phenolic compounds (differences of 11.7% using grapes and 14.7% using grape skins). The best results were generally obtained recording the spectra directly in intact grapes.