DETERMINATION OF TOTAL PHENOLIC COMPOUND CONTENTS AND ANTIOXIDANT CAPACITY IN LEAVES OF FRUIT SPECIES COMMONLY CONSUMED IN EUROPE USING NEAR INFRARED SPECTROSCOPY AND CHEMOMETRIC APPROACH

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The content of total phenolic compounds, total flavanols, and total flavonols and antioxidant capacity (2-2-diphenyl-1-picrylhydrazil–DPPH and oxygen radical absorbance capacity–ORAC) were determined rapidly and efficiently using near infrared spectroscopy (NIR) with the help of chemometric tools. Seventy samples from different varieties of Ficus carica, Malus domestica, Prunus cerasus, Prunus domestica, Pyrus communis, and Vitis vinifera were used in this study. Two extracts of vegetal materials were used to quantify total phenolic compounds by Folin-Ciocalteau method (ethanol and acetone acidified extracts). For the other analysis just acetone acidified extracts were used. The partial least square (PLS) and multiple linear regression (MLR) methods with different pre-processing methods were studied and compared in prediction models. The models were optimized using a leave-one-out cross validation. Their performances were evaluated by root mean standard error of prediction (RMSEP) and coefficient of correlation ($r$). Experimental results demonstrated that PLS regression methods were the best regression method to predict antioxidant capacity and phenolic compounds in leaves of fruit species commonly consumed in Europe. The values of RMSEP ($RMSEP < 12.5\%$) and $r$ ($r > 0.86$) allowed to propose NIR technique coupled with chemometric tools as a rapid, non-invasive and suitable method for the screening purposes and semi-quantitative determination of phenolic compounds and antioxidant capacity in vegetal species.