Total polyphenol content in food samples and nutraceuticals: Antioxidant indexes versus high performance liquid chromatography

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Polyphenols are ubiquitously present in plants as a large family of secondary metabolites. Depending on their structures, they can be classified in phenolic acids, flavonoids, stilbenes, lignans and tannins. Polyphenols display several healthy attributes, such as antioxidant, anti-inflammatory, antimicrobial and antineoplastic properties, so that they are commonly included as basic ingredients in several pharmaceutical and nutraceutical products.

In this research, the total content of polyphenols and the antioxidant capacity of various food samples and nutraceuticals have been estimated, including cranberry, raspberry, artichoke, grapevine, green tea, coffee, turmeric and other medicinal plant extracts. Samples have been analyzed by using different methods, such as high-performance liquid chromatography (HPLC) and two antioxidant assays —ferric reducing antioxidant power (FRAP) and Folin-Ciocalteau (FC)—.

A preliminary data exploration by PCA has revealed that HPLC fingerprints are suitable chemical descriptors to classify the analyzed samples according to their nature and origin. Besides, chromatographic fingerprints have been correlated with antioxidant data using partial least squares (PLS). Regression models have shown a good prediction capacity to estimate the antioxidant activity from chromatographic data, with determination coefficients (R^2) of 0.971 and 0.983 for FRAP and FC assays, respectively.