

## Comparison of the phenolics profile of regional and commercial cultivars of apples (*Malus domestica*) from Alcobaça region (Portugal)

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Phenolic compounds are believed to have antioxidant properties, and therefore many studies have been conducted in order to search for the presence of such compounds in food matrices and the effects that they cause [1, 2]. Some of the most common sources of phenolic compounds in human diet are fruit and fruit based products, particularly apples [3].

An Ultra-High Performance Liquid Chromatography combined with Time-of-Flight Mass Spectrometry (UHPLC-ToF-MS) method was developed for the determination of individual phenolics in the pulp and by-products of regional and commercial cultivars of apples from Alcobaça region (Portugal). The analytical method was evaluated regarding linearity, limit of detection, limit of quantification and accuracy, showing its suitability for the quantification of phenolic compounds.

Epicatechin, quercetin-3-b-d-glucoside, quercetin, chlorogenic acid and 4-hydroxybenzoic acid were the main phenolic compounds found in all portions of apples, namely: peels, seeds, and pulp (mesocarp).

Apple peels presented the highest content of phenolic compounds. For example, in the Noiva variety, peels had the highest concentration of epicatechin ( $80.69 \pm 0.59 \mu\text{g/g}$ ), followed by seeds ( $16.36 \pm 0.48 \mu\text{g/g}$ ) and lower levels were found in the pulp ( $3.74 \pm 0.08 \mu\text{g/g}$ ).

Phloridzin, one of the most recognized apple polyphenols, was quantified in all apples, however, different cultivars have different levels of this phenolic compound. In peels, the level of phloridzin ranges between  $10.8 \mu\text{g/g}$  in the Bonita variety to  $0.57 \text{ mg/g}$  in the Fujion variety.

Some cultivars of apples showed very high levels of phenolic compounds, associated with their putative benefits for Human Health. Moreover, their by-products showed great potential as source of natural antioxidants.

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