

## Effects of two different extraction methods on polyphenolic content and antioxidant capacity of *Sambucus nigra* and *Punica granatum* fruit extracts

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Fruit extracts of *Sambucus nigra* (elderberry) and *Punica granatum* (pomegranate) have several applications in food industry thanks to their richness in antioxidant polyphenols. Their polyphenolic composition changes according to the extraction method applied. We aimed to compare the performance of two extraction methods, fermentation and ultrasound-assisted extraction (UAE), on the yield of antioxidant polyphenols from elderberry fruits and pomegranate fruit-peels. Extracts were obtained by fermentation (using water) and by UAE (using 70 % ethanol) and analyzed by LC-ESI-Q-ToF (for the identification of polyphenols) and by HPLC-DAD (for the determination of the polyphenolic content). The antioxidant capacities of the different extracts were spectrophotometrically evaluated using both DPPH and Hydroxyl Radical Scavenging (HRS) assays. The main compounds detected in elderberry extracts were hydroxycinnamic acid derivatives (caffeoyl derivatives) and flavonols derivatives (especially quercetin glycosides), both classes present in higher amounts in UAE extracts. In pomegranate, ellagic acid glycosides and punicalagins alfa and beta were the main constituents. These compounds were detected in higher contents in the UAE-ethanolic extracts compared to fermented extracts. The UAE method was also more suitable for extracting anthocyanins in both species. Higher antioxidant capacities were observed in UAE-ethanolic extracts compared to fermented ones for both fruits' types, possibly due to their richer polyphenolic content. Therefore, the UAE showed to be better for the extraction of polyphenols from both elderberry and pomegranate fruits, resulting also in extracts with greater antioxidant capacity. In conclusion, considering the wide application of these fruits in food industries, and the simplicity and low-cost of the method, the UAE can be used to obtain polyphenolic antioxidant extracts to be applied as nutraceutical and food additives.

**Keywords:** anthocyanins, DPPH, fermentation, LC-ESI-Q-ToF, UAE.