Impact of processing upon dry blueberry fruit aqueous extracts

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Introduction

The *Vaccinium genus,* from the *Ericaceae* family, is composed by *ca*. 450 species distributed worldwide. *Vaccinium corymbosum*, also known as highbush blueberry, is one of the several species that are known to produce blueberries (small, dark blue berries with a bittersweet taste). Common cultivated varieties are either Northern Highbush Blueberries (NHB) or Southern Highbush Blueberries (SHB) depending on their temperature requirements. Blueberries are known as a good source of phenolic compounds. Kader *et al.* (1996), Skrede *et al*. (2000) and Brambilla *et al.* (2008) reported three types of phenolic acids (gallic, siryngic and vannilic) and four types of cinnamic acids (chlorogenic, the major cinnamic derivative, caffeic, ferulic, o- and p-coumaric).

Due to the high content in pectins found in blueberry the standard procedure in industry is to depectinize the blueberry prior to its use as an ingredient. Considering that one of the possible applications of these extracts is as a functional ingredient, the aim of this study was to access the impact of depectinazation when performed after processing and pectinases were inactivated through heat treatment.

Procedure

Powdered dry fruit
(1:1:1:1, weight proportion, of blueberries from Duke, Ozarkblue, Goldtraube and Bluecrop cultivars)

Infused extracts
(addittion of 100 mL of water, at 100 °C, to 5 mg of powdered dry druit, stired for 15 min and then filtered)

Boiled extracts
(5% (w/V) aqueous suspensions heated to 100 °C for 15 min, with agitation and then filtered)

Depectinization
(addition of pectinases from *Aspergillus aculeatus* (1% (V/V), incubation for 1 h at 40 °C, heating to 100 °C and filtering)

Characterization

Total phenolic content: Determined using the Folin-Ciocalteu reagent as described by Gião *et al.* (2007). The results were given in g/L of gallic acid equivalent.

Total antioxidant capacity: Determined usinf the ABTS radical cation assay, according to the mofifications propoed by Gião *et al.* (2007). The results were givem in g/L of ascorbic acid equivalent.

Total anthocyanin content: Determined using the pH differential method as described by Jakobek *et al.* (2007). The results were given in g/L of cyanidin-3-glucoside.

Phenolic profile: Cromatographic profiles obtained using HPLC-DAD at 310 nm (phenolics) and 520 nm (anthocyanins)

Results

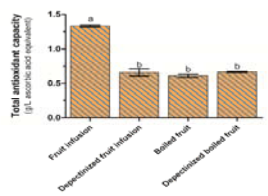

Fig.1 – Total antioxidant capacity.

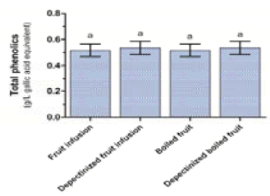

Fig.2 – Total phenolic content.

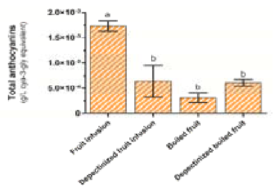

Fig.3 – Total anthocyanin content.

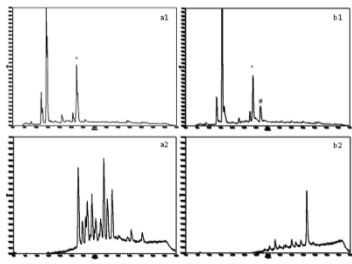

Fig.3 – Chromatographic profile at 520 (2) and 310 (1) nm for untreated (a) and depectinized (b) infusions.

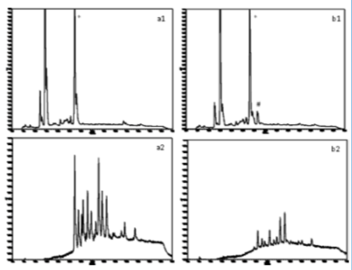

Fig.4– Chromatographic profile at 520 (2) and 310 (1) nm for untrated (a) and depectinized (b) boiled fruit extracts.

Conclusions

- Depectinization showed an impact on total antioxidant capacity and total anthocyanin's content of fruit infusions
- Depectinization had no apparent effect upon boiled fruit extracts
- Chromatographic profiling showed a considerable alteration of the anthocyanins profile for both extraction types after depectinization
- Chromatographic profiling showed little variation of the phenolic profile for both extraction types after depectinization

References

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