

## **Blueberry Bagasse, a Bioactive Residue to Be Included in New Food Products**

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### **Abstract**

Blueberry (*Vaccinium myrtillus* L.) is a very popular fruit, native to the northern hemisphere and consumed worldwide. It has been widely studied for being a rich source of bioactive compounds with recognized beneficial properties for human health. For this reason, several industrialized products, such as juices and derivatives, have been developed from blueberries. However, its manufacture produces about 20-30% of solid waste, which is usually discarded without recovery. In juice processing, for example, there is a large amount of residue generated (bagasse), which represents an environmental issue and a high cost of waste treatment for the industry. Because of light stimulation and other environmental reasons, the phytochemical content of a fruit is usually greater in the epicarp, which is the most representative part of the production of blueberry juice residues (Paes et al., 2014). In this sense, the present work aimed to analyse the phenolic composition of blueberry bagasse hydroethanolic extract, by HPLC-DAD/ESI-MS, and to evaluate its bioactivity, namely the antioxidant capacity, through TBARS and OxHLIA assays, and the antimicrobial activity against a set of eight bacterial strains of interest in the health field, by the microplate microdilution method using a colorimetric assay (INT), as well as its cytotoxicity through the *in vitro* sulforodamine B (SRB) assay, tested in a primary culture of cells prepared from porcine liver. Eight anthocyanin compounds were identified in significant amounts, with cyanidin-3-*O*-glucoside and malvidin-3-*O*-glucoside as the most abundant compounds, and four non-anthocyanin compounds, with *cis* 5-*O*-caffeoylquinic acid and *trans* 5-*O*-caffeoylquinic acids as the most representative ones. Regarding bioactive properties, as expected considering its chemical composition, the extract also revealed a strong antioxidant capacity, being able to inhibit lipid peroxidation and oxidative hemolysis. In terms of antimicrobial activity, the studied extract did not show bactericidal action at the tested concentrations; however, it inhibited the growth of four of the five gram-negative

bacteria and two of the three gram-positive bacteria. The best results were achieved against *Morganella morganii* and methicillin resistant *Staphylococcus aureus* (MRSA). Regarding cytotoxicity, the effect of inhibiting non-tumour cell growth was not observed, which is of great importance for considering its inclusion if foodstuff. The results obtained in the present study validate the bioactive quality of the extract obtained from blueberry bagasse, justifying its application in the development of novel and functionalized foods.

**Keywords:** Blueberry bagasse, bioresidue, phenolic compounds, bioactive properties, food ingredient.

### **References**

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