



Instituto Politécnico
de Castelo Branco

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**Optimization of extraction methodology for
recovery of bioactive compounds from Aronia
melanocarpa byproducts.**

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Optimization of extraction methodology for recovery of bioactive compounds from *Aronia melanocarpa* by-products.

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This report presented to the Agrarian School of Polytechnic Institute of Castelo Branco, in order to accomplish the necessary requirements to obtain a degree in Biological and Food Engineering, carried out under the scientific supervision of Professor Doctor Ofélia Maria Serralha dos Anjos, from the Polytechnic Institute of Castelo Branco and Professor Doctor Zanda Krūma, from the Faculty of Food Technology of Latvia University of Agriculture.

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Optimization of extraction methodology for recovery of bioactive compounds from *Aronia melanocarpa* by-products

Dina Medeiros Freitas

Abstract

Aronia melanocarpa is a deciduous shrub native from Northern America, widely spread to all over the world. Easily grown, is possible to harvest it's dark berries between August and September, they are rich in bio compounds with commercial interest.

The aim of this study, was to perceive which is the best raw material and to optimize conditions for extraction of bioactive compounds present in this berry. It was determined best extraction conditions for an extract rich in phenolic compounds and antioxidant activity as well as for an extract rich in anthocyanins. It was also made a brief study on anthocyanins stability at dark room temperature, cooling temperature and at direct light exposure.

Optimization of antioxidant activity extract was possible with 300 mL/L of acetone and 600 mL/L of ethanol acidified with 0.75 % of citric acid, three extractions with 10 min each should performed at 20 °C. Best conditions for anthocyanins extract was defined to be 440 mL/L of ethanol acidified with 0.75 % of citric acid, with a ratio of 50 mL/g of solvent per gram of sample, extraction take 10 min and de performed at 20 °C. To preserve extract of anthocyanins for longer periods of time it should be increased the percentage of citric acid to 1.5 % and kept under refrigeration temperatures.

Keywords:

Aronia melanocarpa, Black chokeberry, Antioxidant activity, Anthocyanins, Phenolic compounds

Otimização da metodologia de extração para recuperação de componentes bioativos a partir de subprodutos de *Aronia melanocarpa*

Dina Medeiros Freitas

Resumo

Aronia melanocarpa é um arbusto de folha caduca, nativo da América do Norte, hoje bastante distribuído pelo mundo. Facilmente cultivável, durante os meses de agosto e setembro é possível colher os seus frutos de cor escura, os quais contêm elevados teores em compostos bioativos com interesse comercial.

O objetivo deste estudo foi determinar o melhor modo de processamento da matéria prima e de extração dos compostos bioativos presentes nas bagas. Foram determinadas as melhores condições de extração para um extrato que fosse rico em compostos fenólicos e antioxidantes e outro em antocianinas. Foi também realizado um breve estudo à estabilidade das antocianinas no escuro à temperatura ambiente, no frigorífico e à exposição direta da luz.

A otimização de um extrato rico em atividade antioxidante foi possível com 300 mL/L de acetona e 600 mL/L de etanol acidificados com 0.75 % de ácido cítrico. A extração deve ser feita por 3 vezes e 10 min cada uma a temperatura de 20 °C. O extrato rico em antocianinas foi conseguido com 440 mL/L de etanol e acidificado com 0.75 % de ácido cítrico, num rácio de 50 mL/g de solvente por grama de amostra, a extração deve durar 10 min e a 20 °C. A preservação do extrato de antocianinas deve ser efetuada mantendo o mesmo em condições de refrigeração e aumentando a concentração de ácido cítrico para 1.5 %.

Palavras chave:

Aronia melanocarpa, Aronia preta, Atividade antioxidante, Antocianinas, Compostos fenólicos

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