Effect of drying temperature on the anthocyanin profile of berry pomace

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In 90% of analyzed berry press residue samples the highest concentration of anthocyanins was obtained by vacuum drying at 45°C temperature.

Twenty-four different anthocyanins were found in 10 different types of berries left over after juice production. The most common was cyanidin 3-glucoside, which was found in 9 berry samples, except elderberry. The most anthocyanin-rich sample was chokeberry dried using vacuum at 45°C temperature with total anthocyanin concentration 3827 mg/100 g expressed as cyanidin 3-glucoside.

The anthocyanin content of all the berry pomace residues studied was significantly reduced with increasing temperature. Similarly, total phenolic content and DPPH activity were reduced in samples dried at higher temperatures in the presence of oxygen.

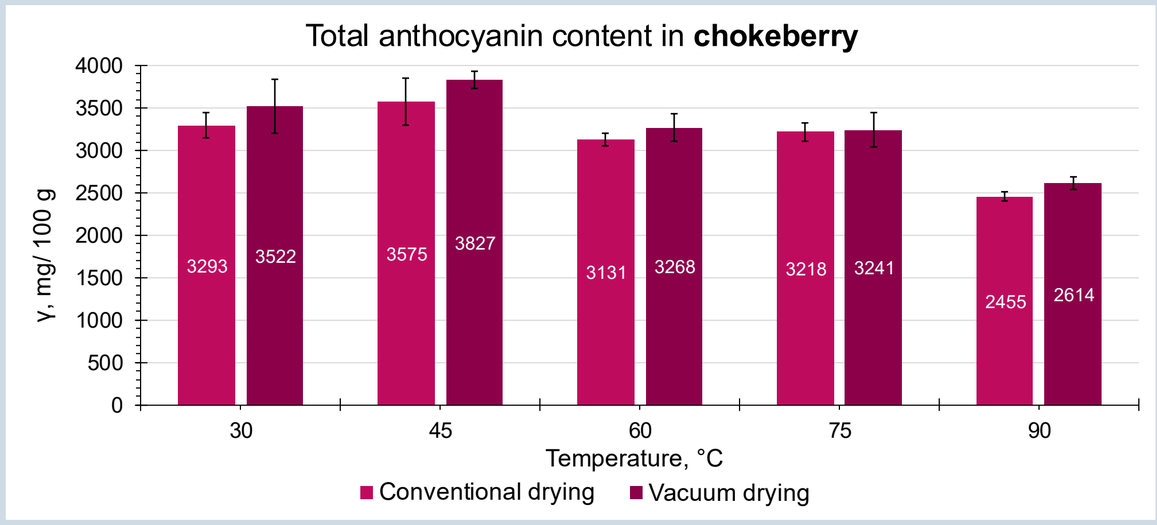

Fig.1. Comparing different temperatures and drying modes, it is clearly seen that the highest concentration of anthocyanins is obtained using drying at 45°C temperature.

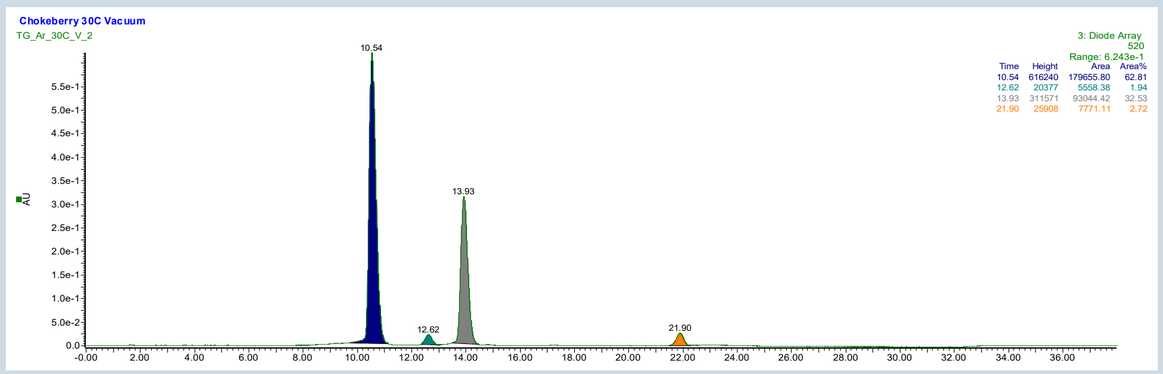

Fig.2. Chromatogram for chokeberry obtained by using UPLC-PDA-UV.

Introduction

The aim of this research was to use the biowaste left over from juice production to retrieve natural pigments, which will later be used in the food industry. This approach is not only environmentally friendly, but is also part of the circular economy, where waste is seen as a valuable secondary resource that helps to reduce waste production.

Natural pigments such as anthocyanins are an alternative to synthetic dyes and are becoming increasingly important due to the potential health risks associated with synthetic dyes.

The study examines how different berries press residues total anthocyanin, total phenolic, and DPPH activity are affected by drying temperature.

Methods

10 different types of berry press residues after juice production were dried at different temperatures (30°C, 45°C, 60°C, 75°C, and 90°C) using both conventional and vacuum drying methods. The dried samples were subsequently ground and extracted using an acidified ethanol solution.

Anthocyanin content was measured via the pH differential method, while total phenolic content and DPPH antioxidant capacity were analysed using spectrophotometric techniques. Total anthocyanin profiles of selected berry extracts dried at 90°C and at 30°C were measured using UPLC-PDA-UV.

Acknowledgement

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Results

Fig.3. By comparing different temperatures and drying methodes, it can be seen that the total phenolic content reduced with increasing temperature.

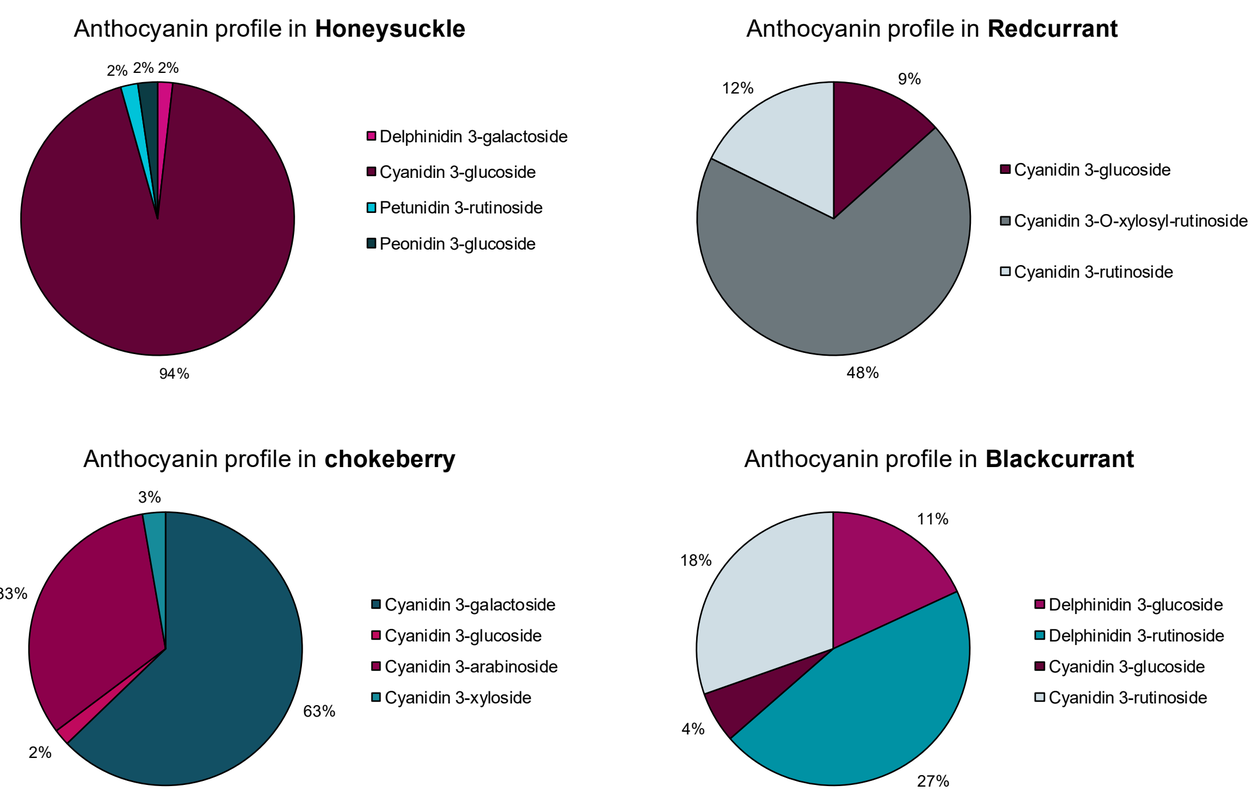

Fig.4. This image shows the anthocyanin profile in four of the ten analyzed berries berries left over after juice production. The dominant anthocyanin varies according to the type of berry.

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