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Extraction of anthocyanins from haskap berry pulp using supercritical carbon dioxide:
Influence of co-solvent composition and pretreatment

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2 dioxide: Influence of co-solvent composition and pretreatment

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7 **Abstract**

8 Extracts rich in anthocyanin compounds were obtained from haskap berry pulp paste using
9 supercritical carbon dioxide (scCO₂) and water as co-solvent. The extraction conditions
10 including pressure, temperature, and amount of water were further optimized by Box-Behnken
11 design. The highest total anthocyanins (TA) yield of 52.7% was achieved at 45 MPa, 65 °C, 5.4
12 g water to 3.2 g berry pulp paste, 15 min static and 20 min dynamic time. Different combinations
13 of water and ethanol as co-solvent did not significantly affect the TA yield. Furthermore, similar
14 anthocyanin extraction yields were obtained in the case of the pulp paste and rehydrated freeze-
15 dried berry pulp powder, which indicates that freeze dryings pretreatment is not required prior to
16 scCO₂ extraction. Compared with conventional extraction, the use of scCO₂ and water as co-
17 solvent offered higher anthocyanin extraction efficiency (52.7% versus 38.3%) with improved
18 antioxidant activity (89.8% versus 72.2%).

19 **Keywords**

20 Anthocyanins; Haskap berry; Supercritical fluid extraction; Co-solvent composition;
21 Pretreatment

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