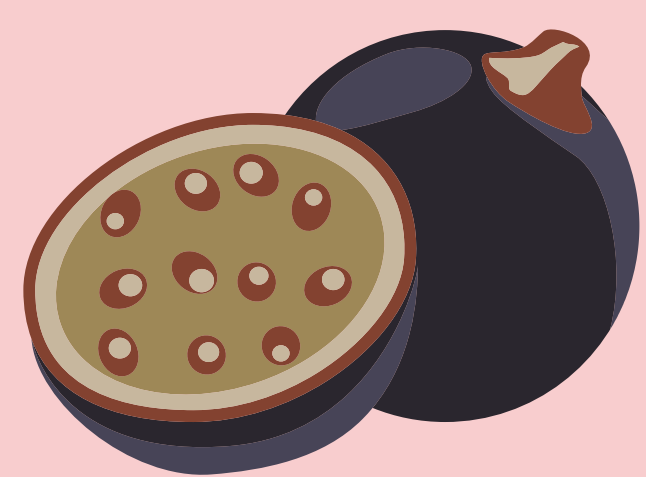


1 Introduction



Blackcurrant pomace:

- major **by-product** of juice processing
- valuable source of **bioactive compounds**
- phenolic compounds with strong antioxidant potential
- valorization potential in sustainable processing and circular economy approaches

2 Aim

The **aim** of this study was to evaluate

- the total phenolic content
- antioxidant capacity (DPPH and ABTS)

of blackcurrant pomace remaining after supercritical CO₂ lipophilic fraction extraction (SC-CO₂)



3 Materials and methods



SC-CO₂ parameters:

Temperature: 40, 50, and 60 °C

Pressure: 200, 300, and 400 bar

CO₂ flow rate: 30 and 40 g/min

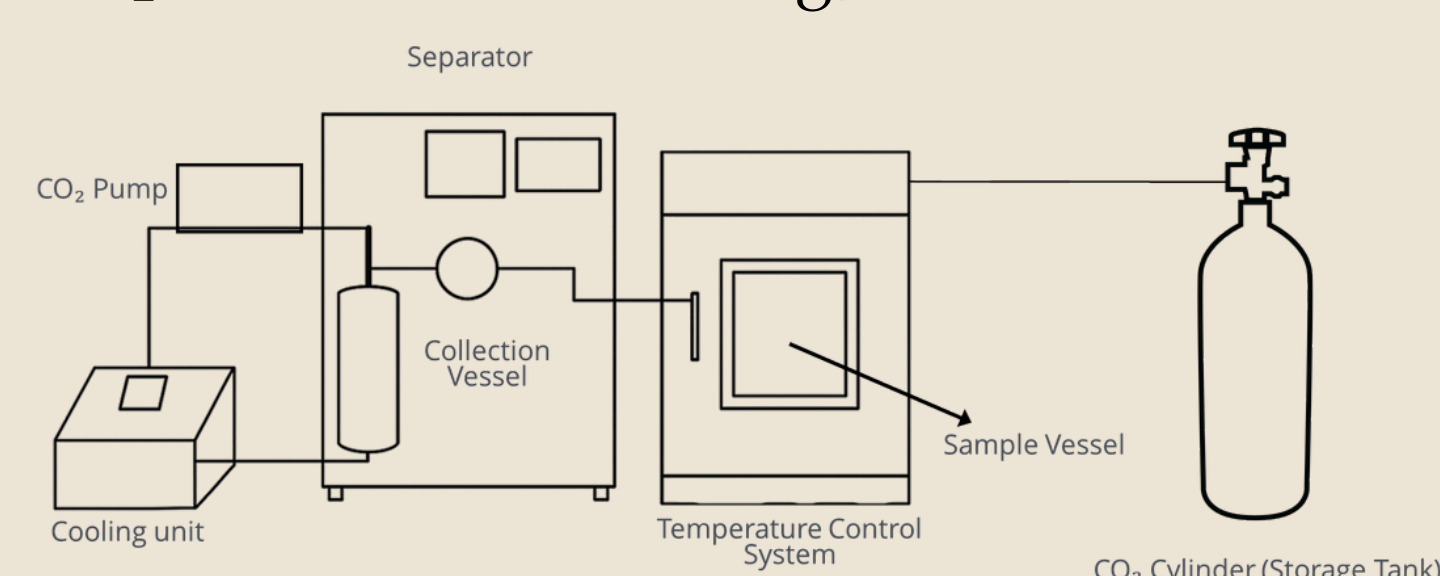


Figure 1. Simplified schematic of the SC-CO₂ system

1. Lipophilic fraction of BP
 2. BP residue after SC-CO₂
- UAE Amplitude: 75%
Time: 5 min
SS ratio: 1:60 g/mL
- the total phenolic content
 - DPPH and ABTS

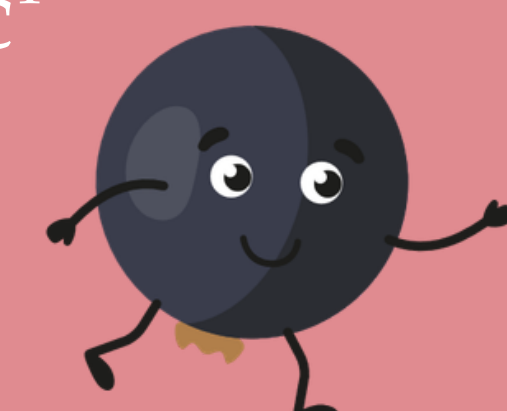
VALORIZATION OF BLACKCURRANT POMACE AFTER SUPERCRITICAL CO₂ EXTRACTION: PHENOLIC CONTENT AND ANTIOXIDANT CAPACITY

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4 Results



Table 1. Effects of SC-CO₂ parameters on total phenolic content and antioxidant capacity of blackcurrant pomace residue.

Source of variation	TPC (mg/g dw)	DPPH (μmol/g dw)	ABTS (μmol/g dw)
Temperature (°C)	p = 0.050*	p = 0.120	p = 0.689
40	31.39 ± 2.46 ^a	620.80 ± 6.99 ^a	408.68 ± 35.37 ^a
50	40.03 ± 2.78 ^b	651.49 ± 13.48 ^a	436.57 ± 29.80 ^a
60	31.91 ± 1.17 ^a	640.04 ± 9.40 ^a	403.33 ± 19.98 ^a
Pressure (bar)	p = 0.080	p = 0.417	p = 0.275
200	38.83 ± 1.72 ^a	639.81 ± 8.53 ^a	452.84 ± 29.84 ^a
300	33.09 ± 3.45 ^a	646.20 ± 12.50 ^a	406.12 ± 29.27 ^a
400	31.40 ± 1.35 ^a	626.32 ± 10.72 ^a	389.62 ± 25.57 ^a
Flow (g/min)	p = 0.577	p = 0.932	p = 0.024 *
30	35.25 ± 2.48 ^a	637.98 ± 9.21 ^a	452.85 ± 20.30 ^b
40	33.63 ± 1.46 ^a	636.90 ± 8.46 ^a	379.54 ± 23.45 ^a

Results are expressed as mean value ± standard error. *Statistically significant variation at $p \leq 0.05$. Mean values followed by the same letter within a column are not statistically significantly different at $p \leq 0.05$. dw — dry weight. TPC - total phenolic content.

The optimal supercritical CO₂ extraction conditions for the maximum recovery of phenolic compounds from BP residue were identified as 50 °C, 30 g/min and 200 bar

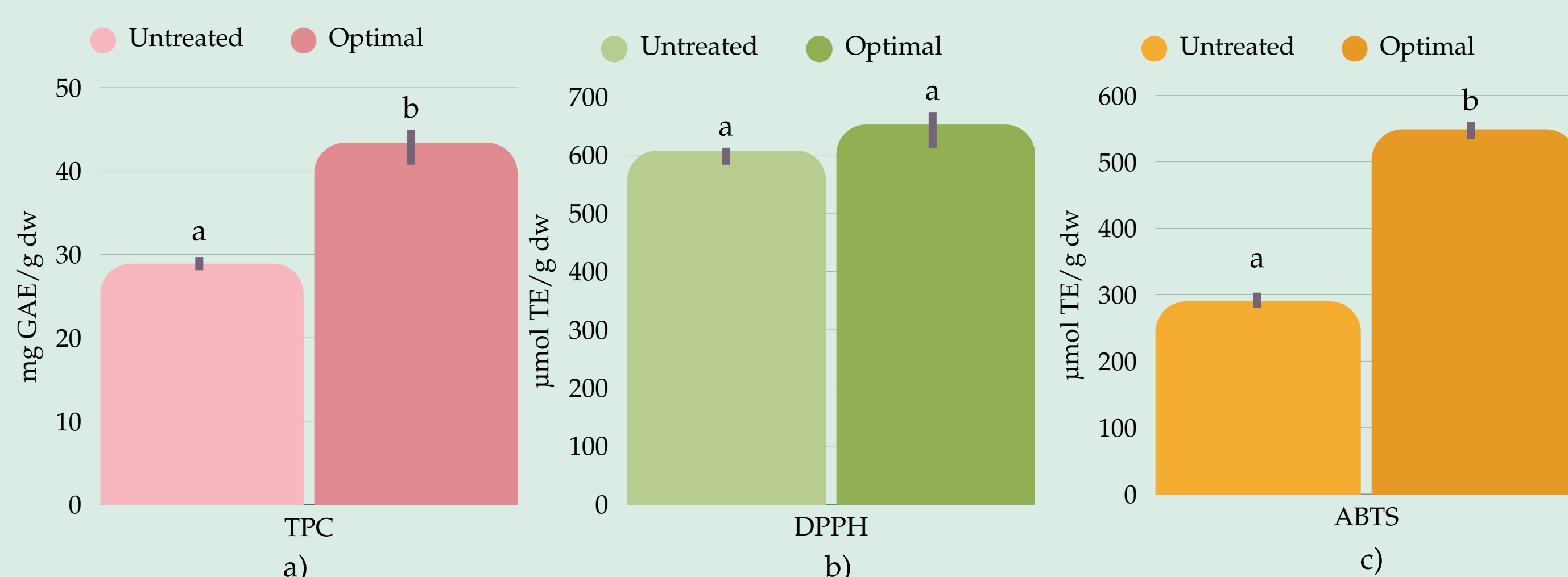


Figure 1. a) Total phenolic content (TPC) and b), c) antioxidant capacity of untreated and SC-CO₂-treated BP

5 Conclusions



- Temperature significantly affected TPC, with the highest value at 50 °C.
- A CO₂ flow rate of 30 g/min resulted in higher ABTS activity.
- Optimal SC-CO₂ conditions were 50 °C, 200 bar, and 30 g/min.
- SC-CO₂-treated pomace remained a valuable source of phenolic compounds and antioxidants.