IMPACT OF CLARIFYING AGENTS ON THE BIOACTIVE COMPOUNDS, ANTIOXIDANT LEVELS AND COLOUR PROPERTIES OF ARONIA JUICE



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Introduction

Aronia melanocarpa (black chokeberry) is rich in polyphenols high levels of **anthocyanins, flavonoids, and phenolic acids**, offering health benefits [1].

Due to its **astringent taste**, it is mainly consumed as processed products like juice [2].

Antioxidant content varies based on variety, ripeness,

Methods

Fully ripe *Aronia melanocarpa* (cv. Nero) was harvested in Lajosmizse, Hungary (2022) and stored at -18 °C. Juice was extracted, enzyme-treated (Pectinex Ultra Colour), heated (80–85 °C), cooled (45 °C), and divided into seven samples: one control and six clarified using combinations of **three positively charged agents (Erbigel, Litto Fresh, Flora Claire)** with two negatively charged agents (Klar Super, Klar Sol30). Samples were analysed in triplicate for total anthocyanin content (TA), total phenolic content (TPC), antioxidant activity (DPPH, and colour parameters (CIE L*ab**, Δ E*). Statistical analysis was conducted using one-way ANOVA (SPSS v27, P<0.05).

cultivation, and especially processing methods [3].

- The juice industry seeks to balance **efficiency** with **nutritional and sensory quality** [4], [2].
- **Clarifying agents** help remove haze and sediment, improving clarity and stability [5].
- These agents are valued for their **efficiency, simplicity, and low cost** [6], [7].

Aim: Evaluate the effect of three positively charged clarifiers (Erbigel, Litto Fresh, Flora Claire) with two negatively charged agents (Klar Super, Klar Sol30) on Aronia juice quality (TAC, TPC, DPPH, Colour).



Findings and Conclusion

- **1.** TAC: No significant difference (P > 0.05); slight increases observed (up to +12.86% with CA3 and CA4).
- 2. TPC: no significant difference (P > 0.05); increases ranged from +7.26% to +12.02% (highest with CA1 and CA4).
- **3. DPPH**:
 - •Significant decrease (P < 0.05) with CA5 (-13.73%) and CA1 (-12.52%).

•Minimal change with CA3 (+0.42%), CA2 (-1.50%), CA4 (-3.23%), CA6 (-5.12%).

Colour $(\Delta E)^*$:

•Plant-based agents (CA2, CA3, CA5, CA6) led to greatly visible colour change ($\Delta E^* > 6$).

•Gelatin-based agents (CA1, CA4) resulted in clearly visible changes ($\Delta E^* = 3-6$).

•Conclusion:

Clarifiers did not significantly affect on TAC or TPC.
Plant-based agents (Litto Fresh, Flora Claire) preserved antioxidant activity better and caused stronger visual changes.
Careful agent selection is key to balancing clarity, nutrition, and sensory appeal.

Figure 1,2. (TAC),(TPC), Different letters denote significantly different groups. CA1: Klar Super+ Erbigel, CA2: Klar Super +Litto fresh, CA3: Klar Super +Flora claire. CA4: KLar Sol30 +Erbigel, CA5: Klar Sol30 + Litto fresh, CA6: Klar Sol30 + Flora claire.



Figure 3. (DPPH) Different letters denote significantly different groups. CA1: Klar Super+Erbigel, CA2: Klar Super +Litto fresh, CA3: Klar Super +Flora claire. CA4: KLar Sol30 +Erbigel, CA5: Klar Sol30 + Litto fresh, CA6: Klar Sol30 + Flora claire.
Figure 4. Colour differences between the control samples and the samples treated with the claryfing agents. CA1: Klar Super+Erbigel, CA2: Klar Super +Litto fresh, CA3: Klar Super +Flora claire. CA4: KLar Sol30 + Erbigel, CA5: Klar Sol30 + Litto fresh, CA6: Klar Sol30 + Flora claire.

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