

Effect of high hydrostatic pressure on physicochemical properties and polyphenol content of strawberry nectars

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INTRODUCTION & AIM

In strawberries, anthocyanins are the most problematic compounds due to instability during the processing and storage of the product. Therefore, new methods of processing and preserving strawberry products have been investigated including high hydrostatic pressure (HHP).

The aim of this study was to determine the effect of high hydrostatic pressure (HHP) on the physicochemical properties and pigment stability of strawberry nectar.

METHOD

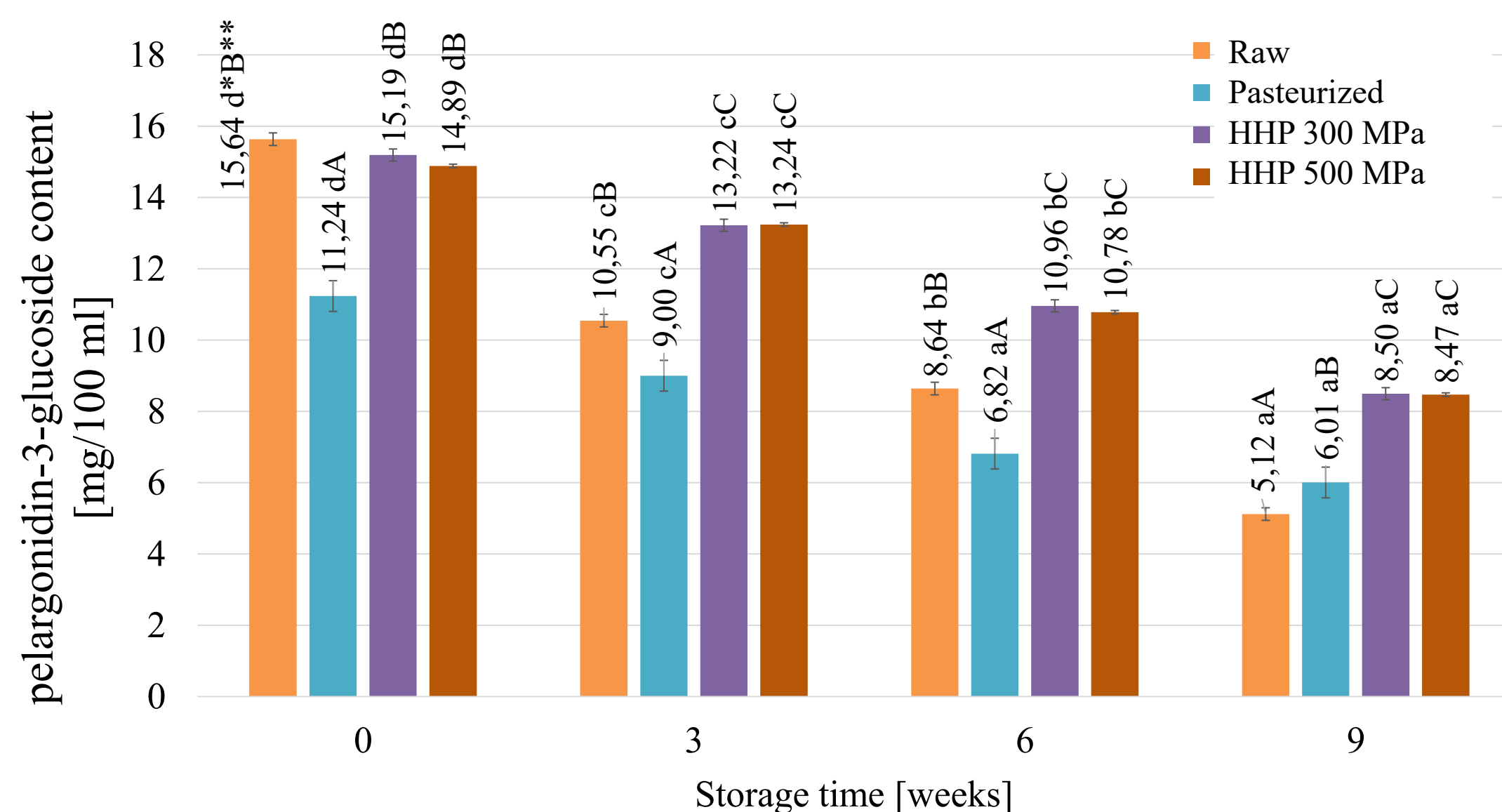
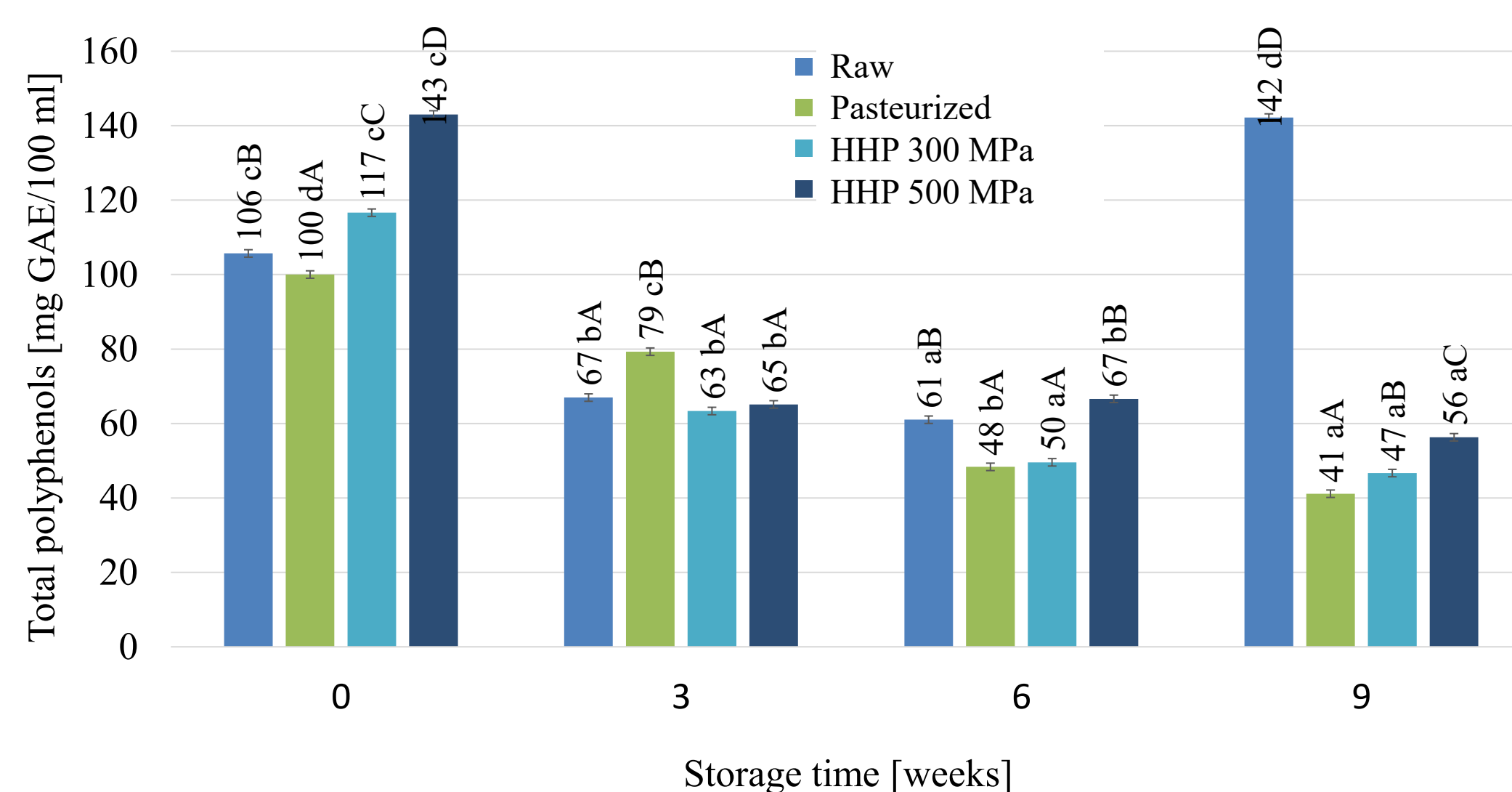
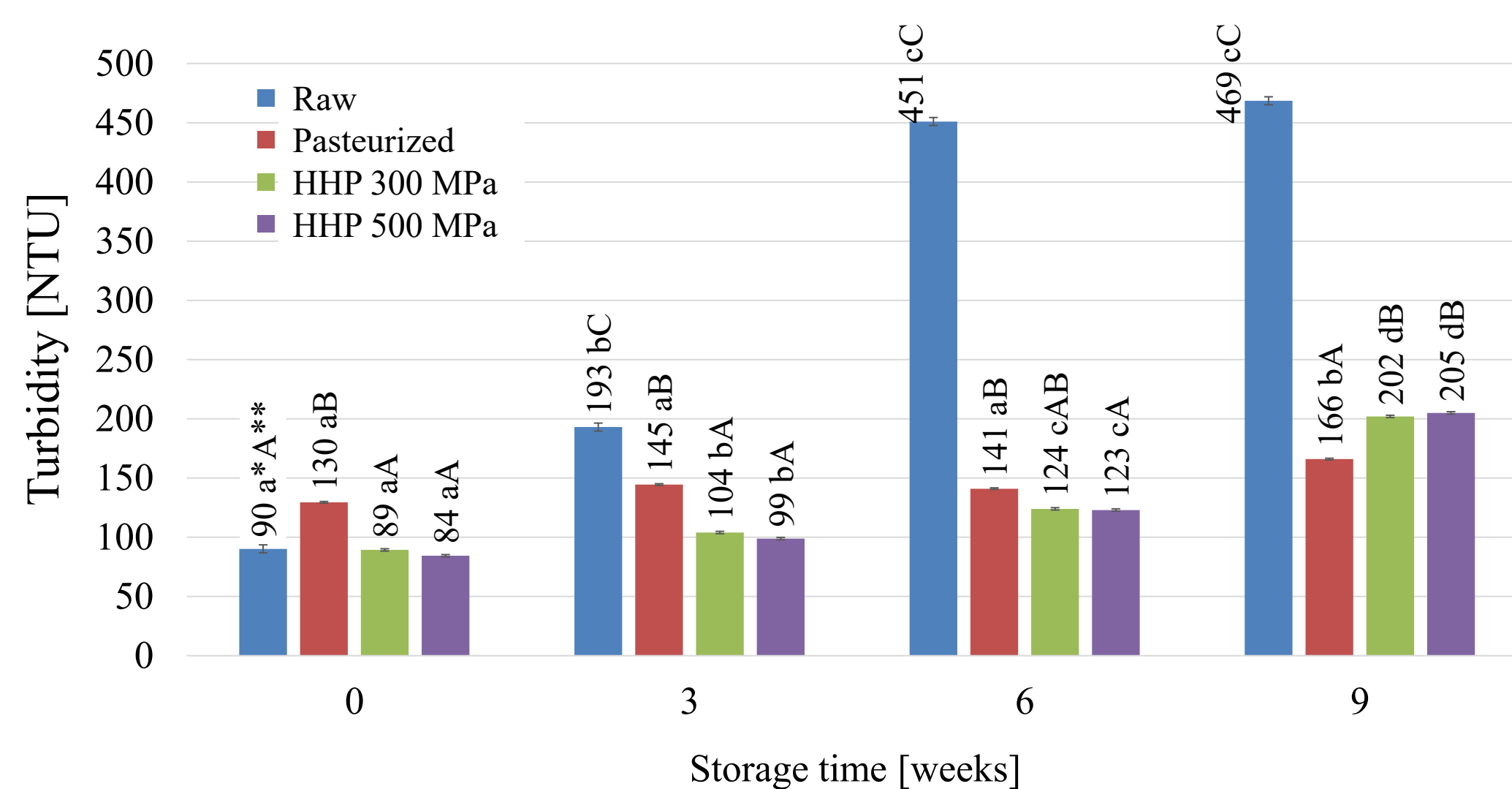
The juice content in the strawberry nectar was 40%. The samples were treated with HHP at 300 and 500 MPa (20°C, 15 min) using U5000/120 pascalizer from UnipressEquipment, Poland; and then were stored for 9 weeks at 4°C.

To check the influence of the process on samples and storage stability, an evaluation of the pH, total acidity, color parameters, turbidity, content of anthocyanins and total polyphenols was performed.

RESULTS & DISCUSSION

HHP processing with 300 and 500 MPa did not affect the pH, extract, or total acidity of the nectar; they were 3.20, 10.0°Brix, and 0.32%, respectively. HHP did not affect the color, turbidity (90 NTU), or anthocyanin content (16.3 mg/100 ml), but the polyphenol content increased significantly. This was most noticeable for the 500 MPa sample - an increase from basic level, at 106, to 143 mg GAE/100 ml was observed.

Cold storage of pressurized nectars gradually increased turbidity to twice its initial value. The color parameter a^* significantly decreased after 9 weeks of storage, while the b^* parameter decreased already after 3 weeks. This was associated with a decrease in the anthocyanin content during storage to 9.28 and 9.32 mg/100 ml for 300 and 500 MPa, respectively. Also, the content of total polyphenols significantly decreased to 47 and 56 mg GAE/ 100 ml (300 and 500 MPa) at the end of storage. After 9 weeks, no changes were observed in the pH, extract, or acidity of nectars.



CONCLUSION

This study showed that nectars just after HHP treatment showed no changes in physicochemical and bioactive compound values. This HHP processing method did not ensure the stability of anthocyanins and thus color during cold storage for longer than 3 weeks. For long-term storage, pressures higher than 500 MPa are required to maintain the nectar quality.