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Impact of storage on *in vitro* bioaccessibility of anthocyanins in 'Rubycot' plumcot and 'Queen Garnet' plum

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Plant breeding programs have developed new cultivars with desirable traits such as high yield, improved nutritional quality, disease and pathogen resistance, and tolerance against harsh environmental conditions. Plumcots are novel stone fruit cultivars developed by hybridizing plums and apricots. 'Rubycot', a new plumcot cultivar recently developed in Queensland, is a dark red fruit rich in anthocyanins. Anthocyanins are the pigments responsible for the dark red colour in Rubycot fruits and are also bioactive compounds with potential health benefits.[1] Fruit storage temperature and time can significantly impact nutritional quality and stability of bioactive compounds, like anthocyanins, by changing their binding to cell wall components and bioaccessibility. The aim of this study was to evaluate the nutritional quality of Rubycot (RC) and Queen Garnet Plum (QGP), a dark purple plum cultivar with high anthocyanin levels, following storage at domestic refrigeration (4°C) and ambient (23°C) temperatures for 7 days. Fruit samples (fresh and stored) were digested using the INFOGEST 2.0 static *in vitro* oral-gastrointestinal digestion method and analysed for total anthocyanin content by UHPLC-DAD-ESI-MS. Compared to fresh (control) fruit, there was a significant ($p < 0.05$) increase in total anthocyanin content in stored RC and QGP fruit. Storage at 4°C increased the total anthocyanin content of RC and QGP by 73% and 6%, respectively. This storage effect was greater at 23°C (RC +245% and QGP +9% versus control). Anthocyanin accumulation during postharvest storage is considered as an important quality attribute of dark red coloured plums, subsequently enhancing their bioactivity.[2] However, no significant ($p > 0.05$) differences were observed in relative anthocyanin bioaccessibility between the control and stored samples as well as between the two storage temperatures after *in vitro* digestion (RC: 1.8% (control), 0.1% (4°C) and 0.5% (23°C); QGP: 7.8% (control), 14.5% (4°C) and 12.3% (23°C)). In conclusion, these findings are important when considering the storage temperature and storage time to maintain, or even improve, the nutritional quality of RC and QGP.

References

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