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Prickly Pear Seeds Flour and Adjunct Lactobacilli Enhance Antioxidant and Functional Properties of Fermented Milk Beverages

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Abstract

Prickly pear seed flour (PPS) has been recognized as a source of fibre and minerals containing phytochemicals with antioxidant and antimicrobial activity (Coşkuner and Tekin, 2003; AbdelFattah *et al*., 2020). This study aims to develop probiotic fermented milks enriched with PPS flour and to evaluate their microbiological, nutritional, sensory, and in vitro biological properties. Specifically, different formulations were produced: plain fermented milk (Control), plain fermented milk with adjunct lactobacilli (*Lactiplantibacillus plantarum* LPAL; *Lacticaseibacillus casei* BGP93; *Lacticaseibacillus rhamnosus* LRB; *Lacticaseibacillus paracasei* LC4P1), fermented milk added with 5% PPS flour, and fermented milk added with 5% PPS flour and adjunct lactobacilli. The starter lactic acid bacteria (LAB) successfully drove the fermentation, and the incorporation of PPS flour did not affect the viability of either the starters or the adjunct lactobacilli. Notwithstanding a slight decrease in LAB viability found over the 40 days of storage, cell density was well above the regulatory thresholds established for fermented dairy beverages. The use of PPS flour, alone or in combination with adjunct lactobacilli, increased the antioxidant activity of the fermented milk formulations across in vitro assays (radical scavenging activity and ferric reducing antioxidant power). The formulation containing PPS flour in combination with probiotic *L. casei* BGP93 exhibited for superior antioxidant performance. When tested on HCT8 cell lines, both at the beginning and end of storage, fermented milk enriched with PPSand BGP93 (PPS-BGP93), decreased the Radical Oxygen Species content and increased the transcription of the gene coding for the anti-inflammatory cytokine IL-10. PPS and PPS_BGP93 displayed the highest mineral levels and total fibre (5%), allowing for the nutritional claim “source of phosphorus” and “source of fibre”. In addition, PPS_BGP93 exhibited good sensory properties.

Keywords: prickly pears, by-product, fermented dairy products, probiotics

References

AbdelFattah, M.S., Badr, S.E.A., Elsaid, A.S., 2020. Nutritive value and chemical composition of prickly pear seeds (Opuntia ficus-indica L.) growing in Egypt. International Journal of Agricultural Policy and Research, 8 (1) p.1-10. doi: 10.15739/IJAPR.20.001i.

Coşkuner, Y.N., Tekin, A., 2003. Monitoring of seed composition of prickly pear (Opuntia ficus-indica L.) fruits during maturation period. J. Sci. Food Agric., 83 (8) p.846-849. doi: 10.1002/jsfa.1423.

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