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Novel fermented fruit products with functional value

Coelho, Eduardo¹; Teixeira, José¹; Domingues, Lucília¹

¹Centro de Engenharia Biológica - Universidade do Minho

E-mail: ecoelho87@gmail.com

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Abstract

Considering a rising demand for novel food products, enriched with functional properties, and fruits as the main source of diversity for food formulations, this work focuses on the application of alcoholic and acetic fermentation processes to obtain novel food products with antioxidant potential. Besides generating differentiated food grade products, fermentation allows an extension of the shelf-life of the raw materials and the use of fruits not suitable for direct sale due to morphological nonconformities or advanced maturation. For this, we used industrially processed concentrates of orange, cherry, mango and banana to produce fruit wines and fruit vinegars. The use of concentrates allowed the production of fruit wines with ethanol yields between 8.66 ± 0.51 % (v/v) and 12.79 ± 0.23 % (v/v), with characteristics close to a wine grade product. From fruit wines, fruit vinegars were produced with total acidities close to 5% as expected for this type of vinegar. Total antioxidant activity was assessed in the fruit wines and vinegars by FRAP, allowing an insight of fermentation impact on the antioxidant potential of the fermented fruit products. Orange and cherry wines and vinegars demonstrated higher antioxidant potential when compared with mango and banana wines and vinegars. Antioxidant activities in fruit wines ranged between 7144.05 ± 770.41 $\mu\text{mol Fe}_2\text{SO}_4/\text{L}$ for mango wine and 28040.00 ± 1848.10 $\mu\text{mol Fe}_2\text{SO}_4/\text{L}$ for cherry wine. In fruit vinegars, antioxidant activities ranged from 3700.95 ± 349.41 $\mu\text{mol Fe}_2\text{SO}_4/\text{L}$ for banana vinegar to 18563.81 ± 2333.94 $\mu\text{mol Fe}_2\text{SO}_4/\text{L}$ for cherry vinegar. Overall, fruit wines showed 0.5 to 0.9 folds higher antioxidant activities than the one reported as naturally occurring in the given fruits. Fermentation impact on antioxidant activity of fruits was low, being observed a reduction of total antioxidant activity from 0.1 to 0.2 folds during alcoholic fermentation and in a higher range from 0.1 to 0.5 folds in vinegars.

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