

Effect of Fermentation on the Bioavailability of Some Fruit Extracts

Authors : Kubra Ozkan, Osman Sagdic

Abstract : To better understand the benefits of these fresh and fermented fruits on human health, the consequences of human metabolism and the bioavailability must be known. In this study, brine with 10% salt content, sugar, and vinegar (5% acetic acid) was added to fruits (*Prunus domestica* L. and *Prunus amygdalus* Batsch) in different formulations. Samples were stored at $20\pm 2^{\circ}\text{C}$ for their fermentation for 21 days. The effects of in vitro digestion were determined on the bioactive compounds in fresh and fermented fruits (*Prunus domestica* L. and *Prunus amygdalus* Batsch). Total phenolic compounds, total flavonoid compounds and antioxidant capacities of post gastric (PG), IN (with small intestinal absorbers) and OUT (without small intestine absorbers) samples obtained as gastric and intestinal digestion in vitro were measured. Bioactive compounds and antioxidant capacity were determined by spectrophotometrically. Antioxidant capacity was tested by the CUPRAC methods, the total phenolic content (TPC) was determined by the Folin-Ciocalteu method, the total flavonoid content (TFC) determined by Aluminium trichloride (AlCl_3) method. While the antioxidant capacity of fresh *Prunus domestica* L. and *Prunus amygdalus* Batsch samples were 2.21 ± 0.05 mg TEAC/g, 4.39 ± 0.02 mg TEAC/g; these values for fermented fruits were found 2.37 ± 0.08 mg TEAC/g, 5.38 ± 0.07 mg TEAC/g respectively. While the total phenolic contents of fresh fruits namely, *Prunus domestica* L. and *Prunus amygdalus* Batsch samples were 0.51 ± 0.01 mg GAE/g, 5.56 ± 0.01 mg GAE/g; these values for fermented fruits were found as 0.52 ± 0.01 mg GAE/g, 6.81 ± 0.03 mg GAE/g, respectively. While the total flavonoid amounts of fresh *Prunus domestica* L. and *Prunus amygdalus* Batsch samples were 0.19 ± 0.01 mg CAE/g, 2.68 ± 0.02 mg CAE/g, these values for fermented fruits were found 0.20 ± 0.01 mg CAE/g, 2.93 ± 0.02 mg CAE/g, respectively. This study showed that phenolic, flavonoid compounds and antioxidant capacities of the samples were increased during the fermentation process. As a result of digestion, the amounts of bioactive components decreased in the stomach and intestinal environment. The bioavailability values of the phenolic compounds in fresh and fermented *Prunus domestica* L. fruits are 40.89% and 43.28%, respectively. The bioavailability values of the phenolic compounds in fresh and fermented *Prunus amygdalus* Batsch fruits 4.27% and 3.82%, respectively. The bioavailability values of the flavonoid compounds in fresh and fermented *Prunus domestica* L. fruits are 5.32% and 19.98%, respectively. The bioavailability values of the flavonoid compounds in fresh and fermented *Prunus amygdalus* Batsch fruits 2.22% and 1.53%, respectively. The bioavailability values of antioxidant capacity in fresh and fermented *Prunus domestica* L. fruits are 33.06% and 33.51, respectively. The bioavailability values of antioxidant capacity in fresh and fermented *Prunus amygdalus* Batsch fruits 14.50% and 15.31%, respectively. Fermentation process; *Prunus amygdalus* Batsch decreased bioavailability while *Prunus domestica* increased bioavailability. When two fruits are compared; *Prunus domestica* bioavailability is more than *Prunus amygdalus* Batsch.

Keywords : bioactivity, bioavailability, fermented, fruit, nutrition

Conference Title : ICFNT 2018 : International Conference on Food and Nutrition Technology

Conference Location : London, United Kingdom

Conference Dates : June 28-29, 2018