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ABSTRACT BOOK

EVALUATION OF ANTI-INFLAMMATORY AND ANTIOXIDANT PROPERTIES OF BIOACTIVE COMPOUNDS IN A NOVEL FUNCTIONAL FOOD: DEHYDRATED POTATOES

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Several studies showed that an uncontrolled reactive oxygen species (ROS) production can cause cellular damage and death also leading to many diseases such as atherosclerosis, arthritis, diabetes, cancer, and inflammatory bowel disease (IBD). In order to maintain the redox homeostasis, ROS are neutralized by the endogenous enzymatic and non-enzymatic antioxidant systems. An imbalance in these mechanisms lead to excessive levels of ROS and subsequently the oxidative stress.¹ Therefore, dietary antioxidants can supplement the antioxidant system and help to reduce the degenerative oxidative damage. Vegetable matrices represent important sources of several classes of antioxidant compounds such as polyphenols and bioactive peptides, which are often used as ingredients for developing functional foods and nutraceutical products.²

Among them, the potatoes (*Solanum tuberosum*) are of particular interest because, in terms of production, potato is the second largest protein-supplying crop per hectare grown, and in terms of consumption since it has been a staple food in many traditional diets of the Western world. To date, more than half of all potatoes consumed are chips, fried and roast potatoes or processed potato products, especially among older children and young adults. Therefore, potatoes represent a contradictory food because they contain macronutrients such as proteins and fibers able to exert beneficial effects on human health. On the other hand, the frequent consumption of fried potatoes appears to be associated with developing obesity, diabetes, and cardiovascular disease due to their large starch content and high glycemic index.³ In addition, potatoes provide other important micronutrients such as vitamins and organic acids, which are all associated with a decreased risk of morbidity and mortality.⁴

For these reasons, in order to maintain the beneficial properties of potatoes and decrease the higher intakes of trans fatty acids, oxidized lipids, acrolein, acrylamide, furan, and glycidamide of fried potatoes, in this work we have investigated the antioxidant properties of dehydrated potatoes.

In detail, an on-line HPLC-2,2'-diphenyl-1-picrylhydrazyl (DPPH•) assay for the screening of antioxidant polyphenol was developed. To identify bioactive peptides, a simulated gastrointestinal digestion was performed. Peptide extract was tested on intestinal epithelial cells (IEC-6) under inflammatory condition. Our results demonstrate that the peptide fraction was able to significantly inhibit pro-inflammatory mediators such as inducible nitric oxide synthase (iNOS) and cyclooxygenase-2 (COX-2) expression and oxidative stress markers such as nitrotyrosine formation and ROS release. The results demonstrate a potential use of dehydrated potatoes in the prevention the inflammatory and oxidative stress state at the intestinal level.

References

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