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Evaluation of antioxidant activity of extracts from four different agro-food byproducts

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Abstract

There is an increasing interest towards the use of antioxidant compounds isolated from natural sources to prevent microbial and oxidation mediated food spoilage due to the health threatening effect of synthetic food preservatives. Under the European project (SusFoFlex), antioxidant extracts were prepared from four different agro-food by-products (orange peel, brewer's spent grain, wheat straw and hazelnut shell) with 80% ethanol, and characterized for total phenolic content and antioxidant capacity using different *in vitro* methods in order to select the best by-product for potential application in food packaging. The total phenolic concentration ranged from 167 to 1013 mg /L (as gallic acid equivalents, GAE, based on Folin assay) corresponding to a total phenolic yield of 1.19 and 9.50 mg/g of by-product d.w. for wheat straw and orange peel, respectively. Also the total cinnamic acids were found at maximum level in orange peel extract (6107 mg/L as ferulic acid equivalents), followed by wheat straw, brewers grain and hazelnut shell. Although hazelnut shell extract demonstrated the hight antioxidant activity in terms of FRAP (20.84 mmol Fe II/mg GAE) and scavenging capacity against ABTS and superoxide radicals, it has problem in milling due to hard and wood nature of the material. Extraction process in wheat straw is not economical due to the low yield; while brewers spent grain has low antioxidant capacity and also needs long drying process to eliminate excess of moisture. Hence, orange peel was selected as a potential inexpensive and natural source of polyphenols for application in food and pharmaceutical industries.

Biography

V. Vadivel has completed Ph.D. in Biotechnology from Bharathiar University, India and then worked as Post-Doc at the University of Hohenheim, Germany. Currently he is working as Post-Doc researcher at the Università Cattolica del Sacro Cuore, Italy.