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Valorization of rice (*Oriza sativa* L.) husk: isolation of antiglycative agents

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ABSTRACT

Today, the minimization and reuse of agrifood wastes are extremely relevant since they could represent a good source of healthy compounds. In order to follow the most recent guidelines of the European Green Deal, the aim of our research was to valorize Lombard cereal processing by-products among which rice husk. Considering the current increasing interest in the antiglycative agents from natural origin, we evaluated the potential antiglycative capacity of polyphenols extracted form rice husk. The extract was obtained with microwave assisted extraction (MAE) coupled with hydroalcoholic mixture. Different factors (such as ethanol percentage in the extraction mixture, time, temperature, and solid to solvent ratio) affecting MAE process were initially studied and optimized using design of experiments (DOE) approach. The antiglycative activity was tested using different *in vitro* systems to monitor different stages of the glycation reaction. In details, the inhibition of Amadori products and of advanced glycation end products (AGEs) formation were evaluated by NBT assay and bovine serum albumin (BSA)-glucose (GLU) or -methylglyoxal (MGO) based systems, respectively. Results indicated that the optimal extraction conditions were 90 °C, 1:35 g/mL, 80% of ethanol, 5 min of extraction. The extract was able to inhibit about 70-90% of AGEs generated in the used *in vitro* systems with its activity always higher than the aminoguanidine (used as reference standard), especially in BSA-MGO systems. The extract was also chemically characterized by RP-HPLC-DAD-ESI-MS^n. The research is currently going on in order to investigate its bioaccessibility and bioavailability before to perform stability investigation in order to reach the final gol consisting in a suitable ingredient for food supplement.

BIOGRAPHY

Papetti Adele has completed her PhD and postdoctoral studies from University of Pavia, Italy. She is Associate Professor in Food Chemistry at the Department of Drug Sciences (University of Pavia), head of Nutraceutical & Food Chem Toxicol Analysis Laboratory, Academic Director of Master degree (NUTRIALIA), and member of the teaching board of PhD school in Chemical and Pharmaceutical Sciences and Related Industrial Innovation.

She is member of the Italian Chemical Society and Professional Member of the Institute of Food Technologists, and of SIFNut (Italian association of nutraceutical formulation development). She has published 93 papers in indexed journals and seven book chapters and has been serving as an editorial

board member of Molecules, Applied Food Biotechnology, Current Research in Nutrition and Food Science, Journal of Food Research, and Frontiers in Chemistry and Frontiers in Nutrition-Food Chemistry Section.

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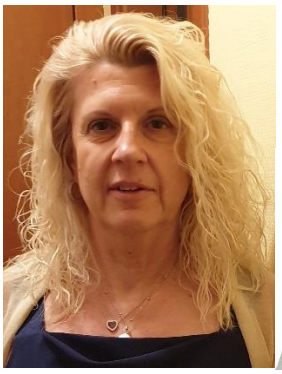

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