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## Antioxidant properties of phenolic extracts and muffins enriched with date fiber concentrates obtained from date fruits (*Phoenix dactylifera L.*) hydrothermally treated.

Guillermo Rodríguez Gutierrez Instituto de la Grasa-CSIC, Spain

Secondary varieties of non-commercial Tunisian dates were thermally treated by steam for its valorization. After the treatment, two phases, liquid and solid, were obtained and characterized. Sugars and phenols were solubilized to the liquid phase remaining an interesting fiber with antioxidant capacity in the solid. The concentration of phenols and the antioxidant activity were increased by the severity of the treatments in the liquid, up to 5311 mg of total phenols/Kg of fresh dates, and up to 62.5 mmol Trolox\*/Kg of fresh date, respectively. Additionally, a long scale study was carried out in a pilot plant with steam treatment at 140 and 160 °C for 30 minutes. The liquid phase was extracted and fractionated chromatographically using adsorbent or ionic resins. The phenolic profiles was determined for each fraction, yielding fractions with interesting antioxidant activities up to EC50 values of 0.08 mg/L or values of TEAC of 0.67 mmol Trolox\*/g of extract. In the solid fraction a fiber concentrates (DFC) was obtained by treatments at 165 and 180C and evaluated as a source of antioxidant dietary fiber. A bakery product like muffins was prepared with 2.5 and 5% flour substitution with DFCs. The DFC-doughs presented a similar yield to the control but the muffins reached a lower volume. The texture did not increase with the density. In fact, the muffins with DFC obtained by the treatment at 165°C were the softest tested, although they had lower cohesiveness and springiness. The proximate composition was similar among samples. The DFC-muffins had higher antioxidant capacity than the control, and obtained good scores in the sensory evaluation. Thus, the thermal treatment leads to obtain a valuable liquid rich in sugars and antioxidant phenols, and a solid rich in antioxidant fiber that can be used as a functional ingredient for baked goods.

## Biography

Guillermo Rodríguez Gutiérrez is currently working as a researcher in the Food Phytochemistry Department, belonging to the Instituto de la Grasa (Spanish National Research Council (CSIC)). He is an expert in agro-food industry by-products valorization by extraction of bioactives compounds after thermal treatments. Her work has made possible the commercialization of the more active phenols in olive from olive oil wastes. He is a vice president of the International Association of Mediterranean Agro-industrial Wastes (IAMAW). Author of more than 47 articles in high impact factor journals (SCI) (h index=16), 4 book chapters, principal investigator of two international research projects an one national, and co-inventor of 9 national and international patent, 5 in exploitation, co-director of 4 PhD thesis in Chemical.

guirogu@cica.es

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