ISEAC-40

INTERNATIONAL CONFERENCE ON

ENVIRONMENTAL & FOOD MONITORING

BOOK OF ABSTRACTS

Santiago de Compostela (Spain)

19-22 June 2018

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA
INSTITUTO DE INVESTIGACIÓN E ANÁLISES ALIMENTARIAS

Universidad Zaragoza
1542

XUNTA DE GALICIA
CONSELLERÍA DE CULTURA, EDUCACIÓN E ORDENACIÓN UNIVERSITARIA
Secretaría Xeral de Universidades

International Association of Environmental Analytical Chemistry

Title

Book of abstracts of the ISEAC-40 International Conference on Environmental & Food Monitoring

Editors

Jose Benito Quintana, Cristina Nerin, Rosario Rodil

ISBN. 978-84-09-03799-5

TH-39

RAPID AND SUSTAINABLE RECOVERY OF PHENOLIC COMPOUNDS FROM OLIVE MILL WASTE WATER WITH GOLD NANOPARTICLES

S. Ciano[1], F. D'Ascenzo[1], I. Fratoddi [2], M. Rapa[1], R. Ruggieri[1], G. Vinci[1], G. Testa[2]

[1]*Department of Management, Sapienza University of Rome, via del Castro Laurenziano 9, 00161, Rome, Italy.*

[2] *Department of Chemistry, Sapienza University of Rome, Piazzale Aldo Moro 5, 00185, Rome, Italy.*

mattia.rapa@uniroma1.it

Phenolic compounds represent one of the most important and ubiquitous groups of plant metabolite. They have possible beneficial implications in human health, such as their anti-microbial, anti-carcinogenic effects and their antioxidant activity. Phenolic compounds could be considered like "quality molecular markers" in food. During the production process of Olive Oil is generate an important by-product: the olive mill waste water (OMWW). OMWW consist of the water contained in the drupe, the washing water and the process water. In OMWW is present a high concentration of phenols and polyphenols, with strong antimicrobial and phytotoxic properties. The aim of this work is to develop a rapid, simple and sustainable extraction procedure based on the use of gold nanoparticles (AuNPs). This method has been recently applied for the extraction of phenolic compounds in Extravirgin Olive Oil (EVOO). The AuNPs are chosen for the interaction with OMWW in order to load phenolic compounds on the surface of NPs and then to release them in a specific tool (nutraceutic, cosmetic, pharmaceutic, etc.). In this framework, nanoparticles can be used, taking advantage of their unique surface properties and high surface/volume ratio. Among others, gold nanoparticles (AuNPs) offer high stability, easy chemical synthesis and a wide range of surface functionalizations also with the use of water or eco-friendly solvents and procedures. AuNPs have been studied as suitable materials for applications ranging from sensors to biotechnology, drug delivery, nanomedicine , food control and optoelectronics. It is noteworthy that AuNPs are considered generally non-toxic, allowing their use for example food analysis and as tools for quality control.

Acknowledgement Sapienza University of Rome

References:

[1] I. Fratoddi, M. Rapa, G. Testa, I. Venditti, F.A., G. Vinci, Microchemical Journal, (2018) 138 .

[2]R. Preti, M.Rapa, Vinci G. J. of Food Quality, (2017) 5329070.

[3] I. Fratoddi, Nanomaterials (2018) 8(1),1.

[4] F. Shahidi, P. Ambigaipalan, J. of Functional Foods, (2015) B 18, p. 820-897.

[5]T.H. Tran, T.D.Nguyen, Colloids and Surfaces B: Biointerfaces (2011) 88 (1), p. 1-22.

[6] Q. Chaudhry, L. Castle, T. in Food Sci. and Tech.2011) 22 (11), p. 595-603.