

11^o CONGRESSO
NACIONAL
DE CROMATOGRAFIA

20 anos
CROMATOGRAFIA

11th NATIONAL MEETING ON CHROMATOGRAPHY

9 | 11 Dezembro 2019
Caparica | Portugal



Faculdade de Ciências e Tecnologia,
Universidade NOVA de Lisboa



Title

11th National Chromatography Meeting

Título

11^o Encontro Nacional de Cromatografia

Authors

Eduardo Mateus (Universidade Nova de Lisboa)

José Manuel F. Nogueira (Universidade de Lisboa)

Marco Gomes da Silva (Universidade Nova de Lisboa)

Maria João Cabrita (Universidade de Évora)

Edition

Faculdade de Ciências e Tecnologia

Universidade Nova de Lisboa

Campus de Caparica, Portugal

<https://www.fct.unl.pt/>

Imaging services

Camy (FCT, Universidade Nova de Lisboa)

URL

<http://11enc.eventos.chemistry.pt/>

e-mail: 11enc@chemistry.pt

ISBN: 978-989-8124-29-6

Scientific Committee

Ana Costa Freitas (Universidade de Évora)
Ana Maria Loureiro da Seca (Universidade dos Açores)
António da Silva Ferreira (Universidade Católica, Porto)
Cristina Delerue Matos (Instituto Politécnico do Porto)
Cristina Maria Dias (Universidade de Évora)
Eduardo Mateus (Universidade Nova de Lisboa)
Fernanda Cosme (Universidade de Trás-os-Montes)
Fernando Nunes (Universidade de Trás-os-Montes)
Isabel C.F.R. Ferreira (Instituto Politécnico de Bragança)
João Queiroz (Universidade da Beira Interior)
José Câmara (Universidade da Madeira)
José Manuel F. Nogueira (Universidade de Lisboa)
José Maria Oliveira (Universidade do Minho)
José Oliveira Fernandes (Universidade do Porto)
José Paulo Silva (Universidade do Algarve)
Ligia Salgueiro (Universidade de Coimbra)
Manuel António Coimbra (Universidade de Aveiro)
Marcela Segundo (Universidade do Porto)
Marco Gomes da Silva (Universidade Nova de Lisboa)
Maria João Cabrita (Universidade de Évora)
Maria Rosário Bronze (Universidade de Lisboa)
Nuno Mateus (Universidade do Porto)
Sílvia M. Rocha (Universidade de Aveiro)

Organizing Committee

Eduardo Mateus (Universidade Nova de Lisboa)
José Manuel F. Nogueira (Universidade de Lisboa)
Marco Gomes da Silva (Universidade Nova de Lisboa)
Maria João Cabrita (Universidade de Évora)

Chairman

Marco Gomes da Silva (Universidade Nova de Lisboa)

Local Organization

Eduardo Mateus (Universidade Nova de Lisboa)
Flávia Freitas (Universidade Nova de Lisboa)
João Brinco (Universidade Nova de Lisboa)
Jorge Lampreia (Universidade Nova de Lisboa)
Marco Gomes da Silva (Universidade Nova de Lisboa)
Maria José Correia (Universidade Nova de Lisboa)
Nazaré Couto (Universidade Nova de Lisboa)
Paula Guedes (Universidade Nova de Lisboa)

Index

PL01 From amino acid analysis in 1969 to characterization of protein biopharmaceuticals in 2019 <i>Pat Sandra</i>	2
PL02 Extraction of chemical information from untargeted chemical profiling (GC-MS) data <i>Rasmus Bro</i>	3
PL03 "Smart" Gradients for Enhancing Peak Capacity in Comprehensive Two-dimensional Liquid Chromatography under Reversed-phase Conditions: Application to Polyphenols in Food and Natural Real-world Samples <i>Paola Dugo, Francesco Cacciola, Katia Arena, Luigi Mondello</i>	4
PL04 PL04 Comprehensive Two-Dimensional Gas Chromatography – Expectations beyond Design? <i>Marriott P</i>	5
O01 Impurity Profiling: know the unknown by HRMS <i>Liliana Silva, Marco Galesio</i>	7
O02 High sensitivity applications with High Resolution MS-QTOF: Analysis of PCB's and PCDD's in fish tissue by GC-APCI-QTOF <i>Miguel Ángel Pérez</i>	8
O03 Effect of gamma radiation on bioactive compounds of olive wastes <i>Madureira J, Dias MI, Barros L, Santos-Buelga C, Margaça FMA, Ferreira ICFR, Cabo Verde S</i>	9
O04 Seasonal effect on the Polycyclic Aromatic Hydrocarbons contents of <i>F. spiralis</i>, <i>Porphyra spp.</i> and <i>Ulva spp.</i> seaweed species harvested in the Portuguese coast <i>Vieira EF, Soares C, Ramalhosa MJ, Sousa S, Oliva-Teles MT, Correia M, Carvalho AP, Domingues VF, Morais S, Delerue-Matos C</i>	10
O05 How far can you get in the analysis of complex mixtures through 2D-LC? <i>António Chana</i>	11
O06 An improved method for determination of sotolon in Port wines <i>Milheiro J, Vilamarim R, Filipe-Ribeiro L, Cosme F, Nunes FM</i>	12
O07 <i>Cytinus hypocistis</i> (L.) L. extract as a source of anti-aging cosmeceutical ingredients <i>Ana Rita Silva, Taofiq Oludemi, José Pinela, Maria Inês Dias, Ricardo C. Calhelha, Maria José Alves, Andrei Mocan, Pablo A. García, Lillian Barros, Isabel C.F.R. Ferreira</i>	13
O08 Combining analytical pyrolysis and chemometrics: A powerful approach to study complex organic matrices <i>Jiménez-Morillo NT, Miller AZ, Palma V, Dias Barrocas C, Cabrita MJ</i>	14
O09 Integration of data from GC-MS and UPLC-QTOF-MS to better understand wine ageing: a new graphical interface <i>A.R. Monforte, A. C. Silva Ferreira</i>	15
O10 The Use of Ion Mobility-MS to Resolve and Discover Sample Complexity In Small Molecule Analysis <i>Alberto Méndez</i>	16
O11 Analysis of skin volatiles using a membrane-SPME/GC-MS approach to unveil putative biomarkers for neurodegenerative diseases <i>Beatriz Andrade, Jorge Pereira, José Câmara</i>	17
O12 Determination of the phenolic composition of vine-canes subcritical water extracts and its utilization for production of a topical formulation <i>Manuela M. Moreira, Francisca Rodrigues, Olena Dorosh, Diana Pinto, Andreia F. Peixoto, Paulo Costa, Simone Morais, Cristina Freire, Cristina Delerue-Matos</i>	18
O13 HPLC and UHPLC Selectivity – Finding a Selectivity Starting Point <i>Zeshan Aqeel, Felipe Silva, Jason Anspach, Ryan Splitstone</i>	19
O14 Separation of Nadolol Racemates by High pH Reversed-Phase Fixed-Bed and Simulated Moving Bed Chromatography <i>R. Arafah, A. Ribeiro, A. Rodrigues, L. Pais</i>	20
O15 Pharmaceutical drugs as emerging pollutants in aqueous media of Northeast Portugal <i>A. Oliveira, A. Ribeiro, P. Brito, A. Queiroz</i>	21
O16 New coloring strategy for dairy products using anthocyanin extracts from edible flowers <i>Tânia C.S.P. Pires, Rúbia C.G. Corrêa, Maria Inês Dias, Lillian Barros, João C.M. Barreira, Celestino Santos-Buelga, Isabel C.F.R. Ferreira</i>	22
O17 Natural colorants in cookies: evaluation of the incorporation effects on the physico-chemical composition <i>Custódio L. Roriz, Eliana Pereira, Sandrina Heleno, Márcio Carochio, Patricia Morales, Lillian Barros, Isabel C.F.R. Ferreira</i>	23
O18 Setting New Benchmarks of Intelligence, Efficiency, and Design in Chromatography <i>Raymond Wong, Anja Grüning, Gesa J. Schad, Jan Stenzler, Manuel Lucini</i>	24
O19 High Throughput Bar Adsorptive Microextraction (HT-BAμE): A simple and effective tool for the simultaneous enrichment of ketamine and norketamine from large number of urine matrices <i>S. M. Ahmad, J. M. F. Nogueira</i>	25
O20 Validation of a method to quantify acrylamide in biscuits <i>João Sioaga, Fernanda Cosme, Fernando M. Nunes</i>	26
O21 Very Fast analysis of TCA In cork Disks by HS-SPME GC/MS/MS – A Proof-of concept <i>Cátia Santos, Renato Cres, Marco Gomes da Silva, Eduardo Mateus</i>	27
O22 Polar Pesticides Anions in water and food using a new and unique Ion Chromatography and Mass Spectrometry High Resolution MSM or MSMS method <i>Ettlin Daniel¹, Jorge Alves², Anne Marie Compianno</i>	28

003 Effect of gamma radiation on bioactive compounds of olive wastes

Madureira J,¹ Dias MI,² Barros L,² Santos-Buelga C,³ Margaça, FMA,¹ Ferreira ICFR,² Cabo Verde S,¹

¹ Centro de Ciências e Tecnologias Nucleares (C2TN-IST), Universidade de Lisboa, E.N. 10 ao km 139.7, 2695-066 Bobadela LRS, Portugal

² Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal

³ Grupo de Investigación en Polifenoles (GIP-USAL), Facultad de Farmacia, Universidad de Salamanca, Campus Miguel de Unamuno s/n, 37007 Salamanca, Spain

Email: sandrav@ctn.tecnico.ulisboa.pt; iferreira@ipb.pt

The olive pomace is an environmentally detrimental residue from olive oil industry. This residue contains large amounts of bioactive compounds, such as hydroxytyrosol and tyrosol, secoiridoid derivatives, phenolic acids and flavonoids¹ that might be used by the food industry as preservatives. The aim of this work was to study the gamma radiation potential to improve the extractability of the bioactive compounds present in olive wastes. Gamma radiation is an eco-friendly technology that can be used to enhance the benefic properties of different agro-industrial products. Olive pomace samples (crude olive pomace - COP - and extracted olive pomace - EOP) were collected from UCASUL - União de Cooperativas Agrícolas do Sul, located in Alentejo region, in Portugal. The irradiation experiments were carried out at room temperature in a Co-60 semi-industrial facility (absorbed doses: 5-22 kGy; dose rate: 16 kGy/h). The characterization of the phenolic profile in the extracts of olive pomace and the identification of the radiolytic products were carried out by HPLC-DAD-ESI/MS².

The major phenolic compounds present in olive pomace extracts were hydroxytyrosol, hydroxytyrosol-1- β -glucoside, tyrosol, syringic acid and luteolin-7-O-rutinoside. Caffeic acid, vanillin, verbascoside and its derivatives and oleuropein aglycons were also found in the extracts although in lower concentrations. The obtained results demonstrated that gamma radiation significantly improved the extraction of phenolic compounds from both olive pomace extracts, obtaining the highest yield at 10 kGy for EOP and at 22 kGy for COP. At these doses, the total concentration of phenolic compounds in the extracts was 159 \pm 7 mg/g in the EOP and 161 \pm 2 mg/g in the COP ones. Comparing with non-irradiated samples, these values represent an increase in extractable phenolic compounds of 2.5 and 2.4 fold, respectively. Nevertheless, for EOP it was found that an absorbed dose of 5 kGy was capable to increase the phenolic content with no significant difference from the higher applied doses.

These results demonstrated that gamma radiation could be a suitable technology for the valorization of olive oil by-products, contributing to enhance extraction of phenolic compounds. This outcome can help the olive oil industry to adopt clean processes and promote the sustainable development.

Acknowledgements: We would like to thank. J. Madureira received a Ph.D. scholarship from Fundação para a Ciência e Tecnologia (FCT)—SFRH/BD/136506/2018; L. Barros and M.I. Dias thank FCT, P.I., for their institutional scientific contract; to UCASUL - União de Cooperativas Agrícolas do Sul” agro industrial cooperative for providing the samples; to Technological Unit of Radiosterilization (University of Lisbon) for the samples irradiation.

Funding: The authors are grateful to FCT, Portugal and FEDER under Programme PT2020 for financial support to CIMO (UID/AGR/00690/2019) and C²TN (UID/Multi/04349/2019), FEDER-Interreg España-Portugal programme through the project 0377_Iberphenol_6_E, and International Atomic Energy Agency (IAEA).

References:

1. E.H. Papaioannou, S.I. Patsios, A.J. Karabelas, N.A. Philippopoulos, J. Environ. Chem. Eng. 1 (2013) 831–837
2. L. Barros, M. Dueñas, I.C.F.R. Ferreira, A.M. Carvalho, C. Santos-Buelga, Food Chem. 127 (2011) 169–173