

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)

FO10 (P09) Qualitative doping analysis of β-blockers in urine by GC-MS/MS <i>Rocha Gomes T., Gomes S., Salema B., Ruivo J.</i>	57
FO11 (P68) Chemical characterization of the sacred wood: final resting place of Benedictine Abbots of St. Margaret, Bijela <i>A. Fundurulić, A. Janeš, A. Manhita, A. Celant, C. Barrocas Dias, D. Magri</i>	58
FO12 (P73) Discrimination of Lavandula essential oil growing in Castelo Branco region by GC-MS and FTIR-ATR <i>Joana Domingues, Daniela Coutinho, Fernanda Delgado, José Carlos Gonçalves, Ofélia Anjos</i>	59
FO13 (P17) Using SPME/GCxGC-ToFMS approach for a rapid and early evaluation of food contamination based on A. niger biomarkers pattern <i>Carina Costa, João Raul Belinato de Souza, Adelaide Almeida, Fabio Augusto, Sílvia M. Rocha</i>	60
FO14 (P74) Development of methodologies to evaluate odour retention capacity in textiles <i>Inês Pinheiro, Ana Magalhães, Catarina Costa, Lorena Coelho</i>	61
FO15 (P75) Rapid determination of some of the most used pesticides in Northeast Portugal as emerging contaminants in rivers by SPME/GC-MS. <i>A. Oliveira, R. Ben Hmida, A. Ribeiro, P. Brito, A. Queiroz</i>	62
P01 Determination of N-nitrosodiethanolamine in shampoo using on-line solid phase extraction-ultra-high performance liquid chromatography coupled to tandem mass spectrometry <i>Alyne Tada, Susanne Rath</i>	55*
P02 Essential oil from Chenopodium ambrosioides: chemical profile in CG/MS and fenotypical analysis of subpopulation T lymphocytes in rats infected with T. cruzi <i>Marley Garcia Silva, Cássia Mariana Bronzon da Costa, Wygny Araujo Macedo, José Clóvis do Prado Júnio²</i>	63
P03 New capillary zone electrophoresis method for the determination of cinchocaine hydrochloride and hydrocortisone <i>Ahmed S. Saa², Mohamed R. El-Ghobashy, Nada S. Ayish and Badr A. El-Zeany</i>	54*
P04 Chemical characterization of the hydrodistillation residual water and essential oil of Crithmum maritimum <i>Jorge M. Alves-Silva, Inês Guerra, Maria José Gonçalves, Carlos Cavaleiro, Maria Teresa Cruz, Artur Figueirinha, Lígia Salgueiro</i>	48*
P05 Bar Adsorptive Microextraction (BAμE) applied to the Determination of Six Tricyclic Antidepressants <i>M. N. Oliveira, S. M. Ahmad, N. R. Neng, J. M. F. Nogueira</i>	64
P06 Ergosterol rich-extracts from Pleurotus ostreatus (Jacq. ex Fr.) P. Kumm: A comparative study between mushroom and its bio-residues <i>Taofiq Oludemi, Ana Rita Silva, Cristina Costa, Miguel A. Prieto, Joana Barros, Inês Ferreira, João Nunes, Lillian Barros, Isabel C.F.R. Ferreira</i>	65
P07 Phytochemical profile and biological activities of 'Ora-pro-nobis' leaves (Pereskia aculeata Miller), an underexploited superfood from the Brazilian Atlantic Forest <i>Jéssica A. A. Garcia, Rúbia C.G. Corrêa, Lillian Barros, Carla Pereira, Rui M.V. Abreu, Maria José Alves, Ricardo C. Calhelha, Adelar Bracht, Rosane M. Peralta, Isabel C.F.R. Ferreira</i>	66
P08 Targeted metabolites' analysis of Hibiscus sabdariffa L. calyces from Guinea-Bissau (West Africa) <i>Custódio Lobo Roriz, Eliana Pereira, Cristina Caleja, Luís Catarino, Lillian Barros, Isabel C.F.R. Ferreira</i>	67
P09 Qualitative doping analysis of β-blockers in urine by GC-MS/MS <i>Rocha Gomes T., Gomes S., Salema B., Ruivo J.</i>	57*
P10 Effects of calcium silicate on the chemical and bioactive composition of Pleurotus ostreatus var. Florida <i>Rossana V. C. Cardoso, Márcio Carochó, Ângela Fernandes, Diego Cunha Zied, João C.M. Barreira, Ana M. González-Paramás, Lillian Barros, Isabel C.F.R. Ferreira</i>	68
P11 UV-C radiation increases Vitamin D2 content in Pleurotus ostreatus <i>Rossana V. C. Cardoso, Ângela Fernandes, João C.M. Barreira, Ana M. González-Paramás, Lillian Barros, Isabel C.F.R. Ferreira</i>	69
P12 HPLC-PDA-MS/MS analysis of the leaves of two Jasminum species from Egypt <i>EL-Hefnawy H, El-Hawary S, Mokhtar F, Osman S, Sobeh M, EL-Raey M</i>	70
P13 Insights into the phenolic composition and bioactive properties of Aloe vera flower <i>Mikel Añibarro-Ortega, José Pinela, Ana Ćirić, Andrei Mocan, Cristina Caleja, Olga Ferreira, Lillian Barros, Marina Soković, Isabel C.F.R. Ferreira</i>	71
P14 Determination of MOSH and MOAH by CGXCG-TOFMS <i>Julio Lluch</i>	72
P15 Chemical Profile of Nutraceutical Formulations with Natural Preservatives <i>Filipa A. Fernandes, Filipa Mandim, Márcio Carochó, Sandrina A. Heleno, Maria Inês Dias, Lillian Barros, Jesus Simal-Gandara, Miguel A. Prieto, Isabel C. F. R. Ferreira</i>	73
P16 Analytical strategies based on tandem mass spectrometry detection for quantification of bioactive compounds in biological matrices <i>Luisa Barreiros, Sara R. Fernandes, Sandia Machado, Eduarda M. P. Silva, Marcela A. Segundo</i>	74
P17 Using SPME/GCxGC-ToFMS approach for a rapid and early evaluation of food contamination based on A. niger biomarkers pattern <i>Carina Costa, João Raul Belinato de Souza, Adelaide Almeida, Fabio Augusto, Sílvia M. Rocha</i>	60*
P18 Occurrence of polybrominated diphenyl ethers and their metabolites in Douro river biota <i>D. Menezes-Sousa, S.C. Cunha, F.H.S. Fogaça, M.B. Alonso, J.P.M. Torres, A. Marques, L. Guilhermino, J.O. Fernandes</i>	49*
P19 Determination of Micro Pollutants in Sediment of the Portuguese Coast <i>Santos P, Rocha C, Palma C, Silva R</i>	75
P20 Wine aroma and SO₂ influence on white must fermentation <i>Cátia V. Almeida Santos, Marco D.R. Gomes da Silva, Maria João Cabrita</i>	76
P21 Valorization of sugars from aqueous fraction resulting from liquefaction of eucalyptus wood <i>Silva L B, Galhano dos Santos R, Bordado J C, Pinto P, Rauter A P</i>	77

P13 Insights into the phenolic composition and bioactive properties of *Aloe vera* flower

Mikel Añibarro-Ortega,¹ José Pinela,^{1,*} Ana Ćirić,² Andrei Mocan,^{3,4} Cristina Caleja,¹ Olga Ferreira,⁵ Lillian Barros,¹
Marina Soković,² Isabel C.F.R. Ferreira¹

¹ Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal

² Department of Plant Physiology, Institute for Biological Research "Siniša Stanković", University of Belgrade, Bulevar despota Stefana 142, Belgrade, Serbia

³ Department of Pharmaceutical Botany, "Iuliu Hațieganu" University of Medicine and Pharmacy, Gheorghe Marinescu Street 23, 400337 Cluj-Napoca, Cluj, Romania

⁴ Laboratory of Chromatography, Institute of Advanced Horticulture Research of Transylvania, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca 400372, Romania

⁵ Laboratory of Separation and Reaction Engineering - Laboratory of Catalysis and Materials (LSRE-LCM), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal

Email: jpinela@ipb.pt

Aloe vera leaf has been subject of several scientific studies that aimed to characterize compositional and biological properties.^{1,2} However, the flower (Figure 1) remains an underexploited plant part. Aiming the prospection of bioactive phytochemicals in this plant matrix, this study was focused on the analysis of phenolic compounds and *in vitro* antioxidant, antimicrobial, and tyrosinase inhibition activities. A dried powder of *Aloe vera* flower underwent a solid-liquid extraction with an hydroethanolic mixture for 1 h, and the phenolic profile of the obtained dried extract was characterized by HPLC-DAD-ESI/MSⁿ. Regarding biological activities, the antioxidant activity was evaluated by the cellular assays of OxHLIA and TBARS, using sheep erythrocytes and porcine brain cells as oxidizable substrates, respectively, and by the β -carotene bleaching inhibition assay; the antimicrobial activity was screened against skin-associated pathogenic bacteria and fungi; and the capacity to inhibit the activity of the tyrosinase enzyme was tested using L-DOPA as a substrate. It was found a phenolic profile constituted mainly by the flavonoids apigenin-6,8-C-diglucoside, apigenin-2''-O-pentoxide-C-hexoside, apigenin-6-C-glucoside, and traces of luteolin glucoside derivatives (accounting for 93.4% of the extract), and by the phenolic acid 5-O-caffeoylquinic acid. As far as we know, it is the first time that some of these compounds are described in *Aloe vera* flower. No anthraquinone glycosides were detected in this part of the plant. The extract revealed an interesting antioxidant activity, being able to protect the erythrocyte membranes and the β -carotene from the free radical generated in the *in vitro* reaction system. It was also able to inhibit and kill multidrug-resistant bacteria such as *Pseudomonas aeruginosa* and *Escherichia coli* and some fungi, including *Candida albicans*. It also inhibited the tyrosinase enzyme activity, which translates its potential as a skin whitening agent. Based on these results, it was concluded that the *Aloe vera* flower could be exploited by industrial sectors interested in bio-based ingredients due to its composition in flavonoids and antioxidant, antimicrobial, and tyrosinase inhibition properties.



Figure 1: *Aloe vera* flower.

Acknowledgements: We would like to thank the Foundation for Science and Technology (FCT, Portugal) for the research contracts of J. Pinela and L. Barros (national funding by FCT, through the institutional scientific employment program-contract). To the project AllNat for the contract of C. Caleja (Project AllNat POCI-01-0145-FEDER-030463). Also to the company "aCourela do Alentejo" for having supplied the plant material.

Funding: This work was financially supported by the Project AllNat-POCI-01-0145-FEDER-030463 (PTDC/EQU-EPQ/30463/2017), funded by FEDER funds through COMPETE2020—Programa Operacional Competitividade e Internacionalização (POCI)—and by national funds through FCT/MCTES; and by the FEDER-Interreg España-Portugal programme through the project 0377_Iberphenol_6_E. We also thank the FCT and FEDER under the PT2020 Program for financial support to CIMO (UID/AGR/00690/2019); and the project TRANSCoLAB (0612_TRANS_CO_LAB_2_P).

References:

1. A. Baruah, M. Bordoloi, H. P. Deka Baruah, *Ind. Crops Prod.* 94 (2016) 951–963.
2. F. Nejatizadeh-Barandozi, *Org. Med. Chem. Lett.* 3 (2013) 5.