



10º Encontro Nacional de Cromatografia

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INSTITUTO POLITÉCNICO DE BRAGANÇA Centro de Investigação de Montanha

COM O ALTO PATROCÍNIO DE SUA EXCELÊNCIA



O Presidente da República

Title

10th Chromatography Meeting

Título

10º Encontro de Cromatografia

Authors / Autores

António M. Peres (Instituto Politécnico de Bragança, Portugal)

Lillian Barros (Instituto Politécnico de Bragança, Portugal)

Luís G. Dias (Instituto Politécnico de Bragança, Portugal)

Isabel C.F.R. Ferreira (Instituto Politécnico de Bragança, Portugal)

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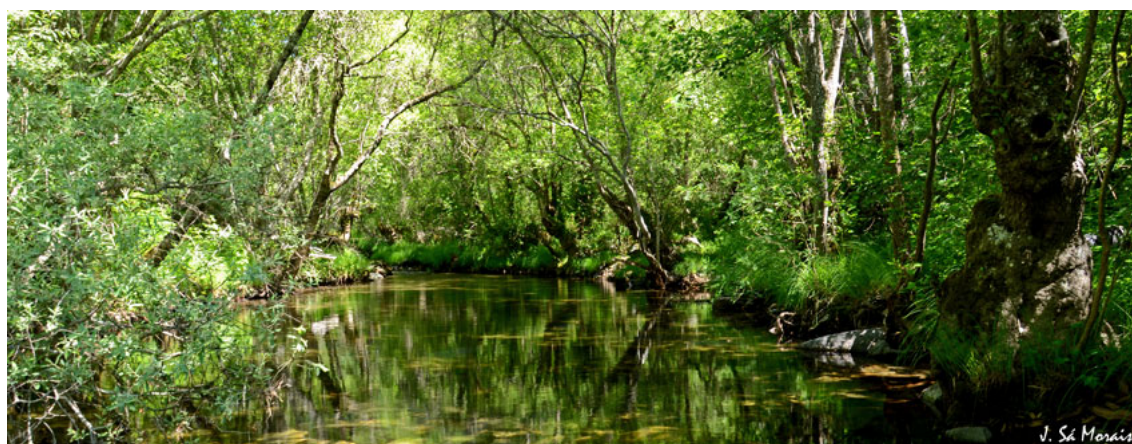
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Sílvia M. Rocha (Universidade de Aveiro)



Program / Programa

Time	December 4	
8:00-9:00		• Registration
9:00-10:00		• Opening session in <i>Auditorium Dionísio Gonçalves</i>
Moderator / Moderador - Auditorium Dionísio Gonçalves Isabel C.F.R. Ferreira (<i>Instituto Politécnico de Bragança</i>)		
10:00-11:00	PL-01	In-tube SPME from open tubular column (in-tube SPME-LC) to directly coupled to mass spectrometry Maria Eugênia Costa Queiroz <i>Universidade de São Paulo, Brasil</i>
11:00-11:30		• Coffee Break and panel session
Moderator / Moderador - Auditorium Dionísio Gonçalves Sílvia M. Rocha (<i>Universidade de Aveiro</i>)		
11:30-12:00	IC-01	Different Strategies Based on Micro(extraction) Followed by GC-MS/MS and LC-MS/MS for the Determination of Personal Care Products in Cosmetics and Environmental Samples Maria Llompart <i>University of Santiago de Compostela, Espanha</i>
12:00-12:30	EC-01	LCMS Technologies: Introducing the Orbitrap for Ultrahigh Resolution Exact Mass and Unequivocal ID Daniel Ettlin <i>Thermo Unicam Sistemas Analíticos</i>
12:30-14:30		• Lunch
Moderator / Moderador - Auditorium Dionísio Gonçalves Nuno Mateus (<i>Universidade do Porto</i>)		
14:30-15:00	IC-02	Back to Basics: Considerations in eco-user-friendly/cost-effective micro-extraction techniques José Nogueira <i>Universidade de Lisboa, Portugal</i>
15:00-16:30	Oral session 1A / Sessão Oral 1A	
	OC-01	A multiresidue targeting approach for pesticide detection in olive oil: the role of dual-layer solid-phase extraction based on molecular imprinting technology Raquel Garcia
	OC-02	New brush-type chiral stationary phases based on xanthone derivatives for liquid chromatography Carla Fernandes
	OC-03	Chromatographic techniques to assess the profile of biomolecules in different mycorrhizal mushroom species Filipa Reis
	OC-04	Multicolumn based liquid chromatography processes for the separation of nadolol racemates António Ribeiro
	OC-05	An expanded bed chromatography approach for improving human mesenchymal stem cells purification Ricardo Silva

OC-06 [Chromatographic analysis of biological samples using monolithic columns](#)
Marcela Segundo

Moderator / Moderador - Auditorium B

Marco Gomes da Silva (Universidade Nova de Lisboa)

15:00-16:30

Oral session 1B / Sessão Oral 1B

- OC-07 [Avaliação da qualidade do ar em espaços de um edifício de ciências](#)
Sara Santos
 Engineered polymer particles for the valorization of phenolic compounds present in mixtures obtained through supercritical extraction
- OC-08 [Thermostability studies of oil-soluble cyanidin-3-glucoside dyes](#)
Catarina Gomes
- OC-09 [Adsorption equilibrium and kinetics of CO₂, CH₄ and N₂ on zeolite BETA with different cations and SiO₂/Al₂O₃ ratio](#)
Adriano Henrique
- OC-10 [Seawater degradation studies of gallic acid persulfate, a promising synthetic antifouling agent](#)
Cátia Vilas Boas
- OC-11 [BeerOmics: how can advanced gas chromatography help to understand beer aroma properties?](#)
Cátia Martins

16:30-17:00

- Coffee Break + Poster session

Moderator / Moderador - Auditorium Dionísio Gonçalves

José Manuel F. Nogueira (Universidade de Lisboa)

[Nexera UC Online SFE-SFC-MS System](#)

17:00-17:30

EC-02 **José Manuel Macias**
 Izasa Scientific

17:30-18:00

Oral session II / Sessão Oral II

- OC-13 [Phenolic composition, antioxidant and biological activities of Portuguese vine shoot from *Touriga Nacional* and *Tinta Roriz* varieties](#)
Manuela Moreira
- OC-14 [Caracterização química e bioatividades de *Hibiscus sabdariffa* L.](#)
Inès Jabeur

19:30

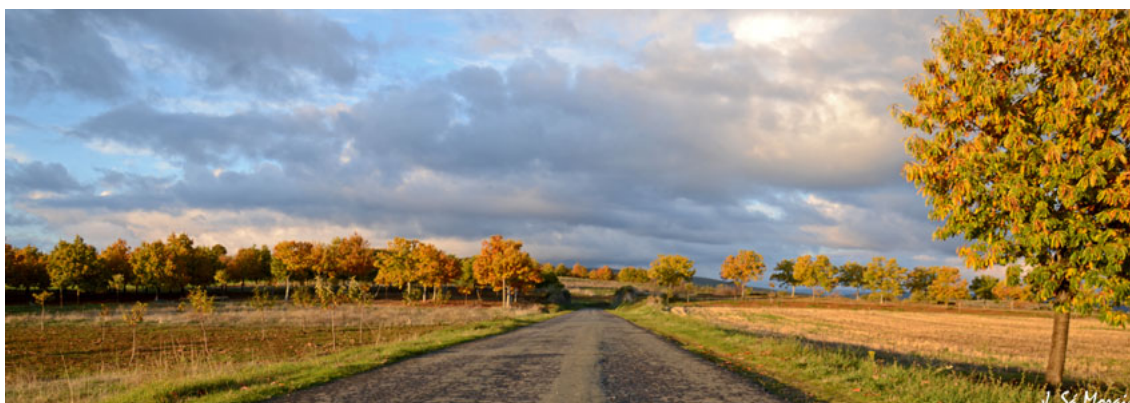
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Time		December 5	
Moderator / Moderador - Auditorium Dionísio Gonçalves Marcela Segundo (Universidade do Porto)			
9:00-10:00	PL-02	Green Foodomics: new strategies towards the discovery of functional food ingredients with biological activity Elena Ibanez Institute of Food Science Research – CIAL, Espanha	
10:00-10:30	IC-03	Multicolumn Continuous Countercurrent Chromatography for Downstream Processing of Biopharmaceuticals Paulo Mota University Nova de Lisboa, Portugal	
10:30-11:00		<ul style="list-style-type: none"> Coffee Break + Poster session 	
Moderator / Moderador - Auditorium Dionísio Gonçalves M. Beatriz Oliveira (Universidade do Porto)			
11:00-12:30	Oral session IIIA / Sessão Oral IIIA		
OC-15	Selective capillary coatings for in-tube SPME off-line or on-line with LC-MS/MS for bioanalysis Israel Souza		
OC-16	Preparative separation of nadolol racemates by fixed-bed liquid chromatography using C18 columns Rami Arafah		
OC-17	Hollow fiber microextraction (HFμE) - A new hybrid microextraction technique for trace analysis Alessandra Ide		
OC-18	Tape Adsorptive Microextraction - A new analytical approach for sample enrichment Nuno Neng		
OC-19	Multidimensional chromatographic techniques applied to chemical ecology Eduardo Mateus		
OC-20	Síntese de fase estacionária monolítica e posterior imobilização térmica de polidimetilsiloxano (PDMS) sobre a superfície porosa para aplicação em cromatografia líquida capilar Carla Bottoli		
Moderator / Moderador - Auditorium B Helena Soares Costa (Instituto Nacional de Saúde Dr. Ricardo Jorge)			
11:00-12:30	Oral session IIIB / Sessão Oral IIIB		
OC-21	Permeation of caffeine, CQA and HMF from Coffee silverskin extracts on EpiSkin™ 3D model Diana Pinto		
OC-22	NTME/GC-qMS: a powerful strategy for selection sets of cancer-specific VOMs with potential for cancer differentiation Priscilla Figueira		
OC-23	Validation of a dSPE-HPLC methodology for the determination of biogenic amines in wines Juliana Ferreira		
OC-24	Looking for new contributions in asthma biomarkers - a chromatographic-based approach José Câmara		

	OC-25	Gas-chromatography mass spectrometry analysis of ¹³ C-labeled fatty acids revealed new information about the ruminal biohydrogenation of linolenic acid Susana Alves
	OC-26	Multidetecção de antibióticos em tecidos comestíveis: evolução de estratégias analíticas Andreia Freitas
Moderator / Moderador - Auditorium Dionísio Gonçalves M. Beatriz Oliveira (Universidade do Porto)		
12:30-13:00	EC-03	A new, fast, simple, and ultra-sensitive determination of semi-volatile organic compounds in water samples by GC-MS/MS Triple Quadrupole system Miguel Ángel Pérez Bruker Applications Development Laboratory
13:00-14:30		• Lunch
Moderator / Moderador - Auditorium Dionísio Gonçalves Victor Freitas (Universidade do Porto)		
14:30-15:00	IC-04	Polyphenols identification. Has LC-MS killed HPLC-DAD Celestino Santos-Buelga University of Salamanca, Espanha
15:00-16:30	Oral session IVA / Sessão Oral IVA	
	OC-27	Chromatographic analysis of nutritional and bioactive compounds in vegetative parts of <i>Fragaria vesca</i> L. obtained by in vitro culture Maria Inês Dias
	OC-28	Liquid by-products from canned fish industry as sources of omega-3 polyunsaturated fatty acids Ana Carvalho
	OC-29	Fingerprinting of volatome profile of lemon (<i>Citrus limonum</i>) based on a new analytical approach - NTME/GC-MS analysis José Figueira
	OC-30	Perfil fenólico e bioatividades de maçã portuguesa da variedade "Bravo de Esmolfe" Tânia Pires
	OC-31	The volatile profile for discrimination of lavender and heather honey, using solid phase microextraction and gas chromatography-mass spectrometry Soraia Falcão
	OC-32	<i>Geranium robertianum</i> L. phenolic compounds: individual characterization of stems and leaves profile Marcelo Catarino
Moderator / Moderador - Auditorium B Cristina Delerue Matos (Instituto Politécnico do Porto)		
15:00-16:30	Oral session IVB / Sessão Oral IVB	
	OC-33	Ácido 4-hidrazinobenzoico como agente derivatizante para a determinação de aldeídos por HPLC-UV e LC-MS Pedro Brandão
	OC-34	Effects of natural colourants on the fatty acids profile of different ice cream formulations Custódio Roriz
	OC-35	High Throughput Bar Adsorptive Microextraction (HT-BA μ E): A novel cost-effective tool for monitoring psychotropic drugs in biological matrices Samir Ahmad

	OC-36	Caracterização do perfil fenólico de agrião por HPLC-DAD-ESI/MS e otimização da extração por alta pressão hidrostática utilizando a metodologia de superfície de resposta José Pinela
	OC-37	Polyols based solvents for the extraction of phenolic compounds from <i>Juglans regia</i> L. leaves Vanessa Vieira
	OC-38	Oncolytic virus purification using multi-column chromatography João Mendes
16:30-17:00		• Coffee Break + Poster session
Moderator / Moderador - Auditorium Dionísio Gonçalves Manuela Pintado (Universidade Católica)		
17:00-17:30	EC-04	Aplicações de cromatografia iónica e abordagem às técnicas de preparação em linha de amostras Susana M. M. Pereira MT Brandão Lda
17:30-18:00		Oral session V / Sessão Oral V
	OC-39	Effects of e-beam irradiation on bioactive content of cherry tomatoes Joana Madureira
	OC-40	Otimização da extração de antocianinas de cereja madura através da metodologia de superfície de resposta Carla Pereira
18:00-19:00		Reunião Grupo de Cromatografia SPQ /Meeting
20:00		Meeting Dinner / Jantar do Encontro



Time		December 6	
Moderator / Moderador - Auditorium Dionísio Gonçalves Manuel António Coimbra (Universidade de Aveiro)			
9:00-10:00	PL-03	Comprehensive two-dimensional liquid chromatography in food and natural products analysis Paola Dugo Università di Messina, Itália	
10:00-10:30	IC-05	Separation and concentration of nutraceuticals, active compounds and essential oils from Agro-Food sources using supercritical carbon dioxide Juan Francisco Rodríguez TQUIMA, Espanha	
10:30-11:00		• Coffee Break + Poster session	
Moderator / Moderador - Auditorium Dionísio Gonçalves Alírio Rodrigues (LSRE/LCM, Faculdade de Engenharia, Universidade do Porto)			
11:00-12:00		Oral session VIA / Sessão Oral VIA	
	OC-41	Efeito da radiação gama e feixe de eletrões na concentração de ergosterol em <i>Agaricus bisporus</i> (J.E. Lange) Imbach Ângela Fernandes	
	OC-42	Optimization of the extraction of triterpenes from <i>Ganoderma lucidum</i> Miguel Angel Prieto	
	OC-43	Unveiling the chemical composition of willow added-value lipophilic extractives by gas chromatography-mass spectrometry Patrícia Ramos	
	OC-44	Application of anti-hail net in apple orchards: effects on fruits chemical characteristics Carlos Gomes	
Moderator / Moderador - Auditorium B José Câmara (Universidade da Madeira)			
11:00-12:00		Oral session VIB / Sessão Oral VIB	
	OC-45	Characterization of the volatile composition of encapsuled coffee Daive Mendes	
	OC-46	Increased productivity in impurity profile characterization of innovative pharmaceuticals João Pereira	
	OC-47	Characterization of phospholipids, including plasmalogens, in bivalves of the Portuguese coast using solid-phase extraction followed by gas-liquid chromatography Rui Bessa	
	OC-48	Characterization and Identification of Four Essential Oils by GC-MS Ana Marques	
Moderator / Moderador - Auditorium Dionísio Gonçalves Luís Pais (Instituto Politécnico de Bragança)			
12:00-12:30	EC-05	Successful generic approaches for heartcutting 2DLC with focus on user friendliness Isabelle François Waters	
12:30-13:00		Closing Session / Sessão de Encerramento	

- PL Plenary communication / Comunicação plenária
- IC Invited oral communication / Comunicação oral convidada
- EC Enterprise oral communication / Comunicação oral de empresa
- OC Oral communication / Comunicação oral



J. Sá Morais

EC - Enterprise oral communications / Comunicações orais de empresas

EC-01	LCMS Technologies: Introducing the Orbitrap for Ultrahigh Resolution Exact Mass and Unequivocal ID <i>Daniel Ettlin</i>	12
EC-02	Nexera UC Online SFE-SFC-MS System <i>Jose Manuel Macias, Manuel Lucini, Franz Kramp</i>	13
EC-03	A new, fast, simple, and ultra-sensitive determination of semi-volatile organic compounds in water samples by GC-MS/MS Triple Quadrupole system <i>Diego Martín-Ortiz, Javier López, Miguel Ángel Pérez</i>	14
EC-04	Aplicações de cromatografia iónica e abordagem às técnicas de preparação em linha de amostras <i>Susana M. M. Pereira</i>	15
EC-05	Successful generic approaches for heartcutting 2DLC with focus on user friendliness <i>Isabelle François</i>	16

OC - Oral communications / Comunicações orais

OC-01	A multiresidue targeting approach for pesticide detection in olive oil: the role of dual-layer solid-phase extraction based on molecular imprinting technology <i>Raquel Garcia, Elisabete P. Carreiro, Marco Gomes da Silva, Anthony J. Burke, Ana Maria Costa Freitas, Maria João Cabrita</i>	18
OC-02	New brush-type chiral stationary phases based on xanthone derivatives for liquid chromatography <i>Carla Fernandes, Maria Elizabeth Tiritan, Madalena M.M. Pinto</i>	19
OC-03	Chromatographic techniques to assess the profile of biomolecules in different mycorrhizal mushroom species <i>Filipa S. Reis, Anabela Martins, Lillian Barros, M. Helena Vasconcelos, Patricia Morale, Isabel C.F.R. Ferreira</i>	20
OC-04	Multicolumn based liquid chromatography processes for the separation of nadolol racemates <i>António E. Ribeiro, Rami S. Arafah, Alírio E. Rodrigues, Luís S. Pais</i>	21
OC-05	An expanded bed chromatography approach for improving human mesenchymal stem cells purification <i>Ricardo J.S. Silva, Bárbara Cunha, Margarida Serra, Manuel J.T. Carrondo, Cristina Peixoto, Paula M. Alves</i>	22
OC-06	Chromatographic analysis of biological samples using monolithic columns <i>Marcela A. Segundo, Inês I. Ramos, Luísa Barreiros, Sofia A.C. Lima, Salette Reis</i>	23

OC-07		
	Avaliação da qualidade do ar em espaços de um edifício de ciências	24
	<i>Sara Santos, J.M.F.Nogueira, Cristina Oliveira</i>	
OC-08		
	Engineered polymer particles for the valorization of phenolic compounds present in mixtures obtained through supercritical extraction	25
	<i>Catarina P. Gomes, Gayane Sadoyan, Rolando C.S. Dias, Mário Rui P.F.N. Costa</i>	
OC-09		
	Thermostability studies of oil-soluble cyanidin-3-glucoside dyes	26
	<i>Marta Guimarães, Nuno Mateus, Victor Freitas, Luís Cruz</i>	
OC-10		
	Adsorption equilibrium and kinetics of CO₂, CH₄ and N₂ on zeolite BETA with different cations and SiO₂/Al₂O₃ ratio	27
	<i>Adriano Henrique, José A.C. Silva, Alírio E. Rodrigues</i>	
OC-11		
	Seawater degradation studies of gallic acid persulfate, a promising synthetic antifouling agent	28
	<i>Cátia Vilas-Boas, Sara Cravo, Emília Sousa, Madalena Pinto, Marta Correia-da-Silva</i>	
OC-12		
	BeerOmics: how can advanced gas chromatography help to understand beer aroma properties?	29
	<i>Cátia Martins, Tiago Brandão, Adelaide Almeida, Sílvia M. Rocha</i>	
OC-13		
	Phenolic composition, antioxidant and biological activities of Portuguese vine shoot from <i>Touriga Nacional</i> and <i>Tinta Roriz</i> varieties	30
	<i>Manuela M. Moreira, M. Fátima Barroso, João Vasconcellos Porto, M.J. Ramalhosa, Jaroslava Švarc-Gajić, Letícia Estevinho, Simone Morais, Cristina Delerue-Matos</i>	
OC-14		
	Caracterização química e bioatividades de <i>Hibiscus sabdariffa</i> L.	31
	<i>Inês Jabeur, Eliana Pereira, Lillian Barros, Ricardo C. Calhelha, Marina Soković, Isabel C.F.R. Ferreira</i>	
OC-15		
	Selective capillary coatings for in-tube SPME off-line or on-line with LC-MS/MS for bioanalysis	32
	<i>Israel Donizeti de Souza, Maria Eugênia Costa Queiroz</i>	
OC-16		
	Preparative separation of nadolol racemates by fixed-bed liquid chromatography using C18 columns	33
	<i>Rami S. Arafah, António E. Ribeiro, Alírio E. Rodrigues, Luís S. Pais</i>	
OC-17		
	Hollow fiber microextraction (HFμE) - A new hybrid microextraction technique for trace analysis	34
	<i>Alessandra H. Ide, J.M.F. Nogueira</i>	
OC-18		
	Tape Adsorptive Microextraction - A new analytical approach for sample enrichment	35
	<i>Nuno R. Neng, Samir M. Ahmad, José M.F. Nogueira</i>	
OC-19		
	Multidimensional chromatographic techniques applied to chemical ecology	36
	<i>Eduardo Mateus, Sofia Branco, Davide Mendes, Marco Gomes da Silva, Maria Rosa Paiva</i>	
OC-20		
	Síntese de fase estacionária monolítica e posterior imobilização térmica de polidimetilsiloxano (PDMS) sobre a superfície porosa para aplicação em cromatografia líquida capilar	37
	<i>Fabiane Pires, Carla Beatriz Grespan Bottoli</i>	
OC-21		
	Permeation of caffeine, CQA and HMF from Coffee silverskin extracts on EpiSkin™ 3D model	38
	<i>Francisca Rodrigues, Diana Pinto, Filipa B. Pimentel, Rita C. Alves, M. Beatriz P.P. Oliveira</i>	
OC-22		
	NTME/GC-qMS: a powerful strategy for selection sets of cancer-specific VOMs with potential for cancer differentiation	39
	<i>Priscilla Porto-Figueira, Jorge Pereira, José S. Câmara</i>	

OC-23		
Validation of a dSPE-HPLC methodology for the determination of biogenic amines in wines	40	
<i>Juliana Milheiro, Leonor C. Ferreira, Luís Filipe-Ribeiro, Fernanda Cosme, Fernando M. Nunes</i>		
OC-24		
Looking for new contributions in asthma biomarkers - a chromatographic-based approach	41	
<i>Pedro H. Berenguer, Catarina L. Silva, Irene C. Camacho, José S. Câmara</i>		
OC-25		
Gas-chromatography mass spectrometry analysis of ¹³C-labeled fatty acids revealed new information about the ruminal biohydrogenation of linolenic acid	42	
<i>Susana P. Alves, Rui J.B. Bessa</i>		
OC-26		
Multidetecção de antibióticos em tecidos comestíveis: evolução de estratégias analíticas	43	
<i>Andreia Freitas, Ana Sofia Vila Pouca, Sílvia Barros, Jorge Barbosa</i>		
OC-27		
Chromatographic analysis of nutritional and bioactive compounds in vegetative parts of <i>Fragaria vesca</i> L. obtained by in vitro culture	44	
<i>Maria Inês Dias, Lillian Barros, Maria João Sousa, Celestino Santos-Buelga, Isabel C.F.R. Ferreira</i>		
OC-28		
Líquidos por produtos da indústria de peixe enlatado como fontes de ácidos gordos poliinsaturados omega-3	45	
<i>Ana P. Carvalho, Ana Monteiro, Diogo Paquincha, Florinda Martins, Rui P. Queirós, Jorge A. Saraiva, Aleksandra Cvetanovic, Jaroslava Svarc-Gajic, Cristina Delerue-Matos</i>		
OC-29		
Fingerprinting of volatome profile of lemon (<i>Citrus limonum</i>) based on a new analytical approach - NTME/GC-MS analysis	46	
<i>José A. Figueira, Priscilla Porto-Figueira, Jorge Pereira, José S. Câmara</i>		
OC-30		
Perfil fenólico e bioatividades de maçã portuguesa da variedade “Bravo de Esmolfe”	47	
<i>Tânia C.S.P. Pires, Maria Inês Dias, Lillian Barros, Maria José Alve, Celestino Santos-Buelga, Isabel C.F.R. Ferreira</i>		
OC-31		
O perfil volátil para discriminação de lavanda e mel de heather, usando extração em fase sólida e cromatografia de gases acoplada a espectrometria de massas	48	
<i>Soraia I. Falcão, Elsa Caveiro, Paulo Russo-Almeida, M. Carmen Seijo, Vitor Martins, Miguel Vilas-Boas</i>		
OC-32		
<i>Geranium robertianum</i> L. compostos fenólicos: caracterização individual de caules e folhas	49	
<i>Marcelo D. Catarino, Artur M.S. Silva, Susana M. Cardoso</i>		
OC-33		
Ácido 4-hidrazinobenzoico como agente derivatizante para a determinação de aldeídos por HPLC-UV e LC-MS	50	
<i>Pedro F. Brandão, Rui M. Ramos, Luís M. Gonçalves, Arnaldo A. Cardoso, Elisabete A. Pereira, José A. Rodrigues</i>		
OC-34		
Efeitos de corantes naturais no perfil de ácidos gordos de diferentes formulações de sorvete	51	
<i>Custódio Lobo Roriz, João C.M. Barreira, Patrícia Morales, Lillian Barros, Isabel C.F.R. Ferreira</i>		
OC-35		
High Throughput Bar Adsorptive Microextraction (HT-BAμE): A novel cost-effective tool for monitoring psychotropic drugs in biological matrices	52	
<i>Samir M. Ahmad, J.M.F. Nogueira</i>		
OC-36		
Caracterização do perfil fenólico de agrião por HPLC-DAD-ESI/MS e otimização da extração por alta pressão hidrostática utilizando a metodologia de superfície de resposta	53	
<i>José Pinela, M.A. Prieto, Lillian Barros, Ana Maria Carvalho, M. Beatriz P.P. Oliveira, Jorge A. Saraiva, Isabel C.F.R. Ferreira</i>		
OC-37		
Solventes baseados em polímeros para a extração de compostos fenólicos de folhas de <i>Juglans regia</i> L.	54	
<i>Vanessa Vieira, Miguel A. Prieto, Lillian Barros, João A.P. Coutinho, Isabel C.F.R. Ferreira, Olga Ferreira</i>		

OC-38		
Oncolytic virus purification using multi-column chromatography		55
<i>João Mendes, Ricardo J.S. Silva, Cristina Peixoto, Paula M. Alves, Manuel J.T. Carrondo</i>		
OC-39		
Effects of e-beam irradiation on bioactive content of cherry tomatoes		56
<i>Joana Madureira, Maria Cojocar, Silvia Garofalide, Pedro M.P. Santos, Fernanda M.A. Margaça, Sandra Cabo Verde</i>		
OC-40		
Otimização da extração de antocianinas de cereja madura através da metodologia de superfície de resposta		57
<i>Carla Pereira, Lillian Barros, Miguel A. Prieto, Isabel C.F.R. Ferreira</i>		
OC-41		
Efeito da radiação gama e feixe de eletrões na concentração de ergosterol em <i>Agaricus bisporus</i> (J.E. Lange) Imbach		58
<i>Ângela Fernandes, Rossana V.C. Cardoso, Amílcar L. Antonio, Sandra Cabo Verde, Lillian Barrosa, Isabel C.F.R. Ferreira</i>		
OC-42		
Optimization of the extraction of triterpenes from <i>Ganoderma lucidum</i>		59
<i>Oludemi Taofiq, Lillian Barros, Miguel A. Prieto, Maria Filomena Barreiro, Isabel C.F.R. Ferreira</i>		
OC-43		
Unveiling the chemical composition of willow added-value lipophilic extractives by gas chromatography-mass spectrometry		60
<i>Patrícia A.B. Ramos, Sónia A.O. Santos, Carmen S.R. Freire, Artur M.S. Silva, Armando J.D. Silvestre</i>		
OC-44		
Application of anti-hail net in apple orchards: effects on fruits chemical characteristics		61
<i>Carlos Martins-Gomes, Luís Pinto, Ermelinda Silva, Sandra Martins, Alexandre Gonçalves, Cátia Brito, José Moutinho-Pereira, M.A. Rodrigues, Carlos M. Correia, Fernando Nunes</i>		
OC-45		
Characterization of the volatile composition of encapsuled coffee		62
<i>Davide Mendes, Pedro Lisboa, Pedro Simões, Eduardo Mateus, Marco Gomes da Silva</i>		
OC-46		
Increased productivity in impurity profile characterization of innovative pharmaceuticals		63
<i>João Pereira, Antonio Serodio, Cátia Sousa</i>		
OC-47		
Characterization of phospholipids, including plasmalogens, in bivalves of the Portuguese coast using solid-phase extraction followed by gas-liquid chromatography		64
<i>Vera Faneca, Susana P. Alves, Rui J.B. Bessa</i>		
OC-48		
Characterization and Identification of Four Essential Oils by GC-MS		65
<i>Mariana Oliveira, Carlos Borges, Ana Patrícia Marques</i>		

PC - Panel communications / Comunicações em painel

PC1		
Optimization of an HPLC analysis to study the interactions between a <i>Saccharomyces cerevisiae</i> protein-rich extract and wine procyanidins		68
<i>Abigail F. Ferreira, Telmo Francisco, Rosa Pérez-Gregorio, Susana Soares, Nuno Mateus, Victor de Freitas</i>		
PC2		
Phenolic compounds from <i>Annona muricata</i> L.: HPLC-DAD analysis of the aqueous extract and nanoformulations		69
<i>Clara Grosso, Simona Mancini, Luca Nardo, Maria Gregori, João Bernardo, Inês Ribeiro, Francesco Mantegazza, Massimo Masserini, Cristina Delerue-Matos</i>		

OC-42

Optimization of the extraction of triterpenes from *Ganoderma lucidum*

Oludemi Taofiq^{a,b,c}, Lillian Barros^a, **Miguel A. Prieto**^{a,d}, Maria Filomena Barreiro^b, Isabel C.F.R. Ferreira^a

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

^bLaboratory of Separation and Reaction Engineering - Laboratory of Catalysis and Materials (LSRE-LCM), Bragança Polytechnic Institute, 5301-857 Bragança, Portugal;

^cGIP- USAL, Unidad de Nutrición y Bromatología, Faculty of Pharmacy, University of Salamanca, Campus Miguel de Unamuno, 37007 Salamanca, Spain

^dNutrition and Bromatology Group, Faculty of Food Science and Technology, University of Vigo, Ourense Campus, E32004 Ourense, Spain.

Ganoderma lucidum is a mycological source rich in several bioactive compounds. Among their constituents, triterpenes have been widely reported to be responsible for some of *G. lucidum* bioactive properties [1]. It has been used, since ancestral times, due to their medicinal and nutraceutical properties. In this context, the achievement of extracts enriched in target compounds, and obtained at optimized extraction conditions, is a relevant field of research where the use of statistical tools, such as response surface methodology (RSM), is becoming increasingly important.

In the present study, the extraction of triterpenes from *G. lucidum* was optimized by using maceration (ME) and ultrasound assisted extraction (UAE), and compared with Soxhlet extraction (SE). The SE technique was considered effective by applying 7 cycles while to optimize ME and UAE, RSM was applied using a circumscribed central composite design with three independent variables (time, ethanol content, temperature (ME) or power (UAE)). The extraction yield and content in triterpenes were maximized and the extracts obtained under the optimal conditions characterized in terms of individual triterpenoids by HPLC-DAD-ESI/MS analysis.

With the SE technique, a positive linear dependency was achieved for the extraction yield while an asymptotic-decreasing behavior was observed for triterpenes' content. The conditions maximizing responses were: 78.9 min, 90°C and 62.5% ethanol and 40 min, 100 W and 89.5 % ethanol for ME and UAE, respectively. The later was the most effective, yielding 4.9±0.6% and 435.6±21.1 mg equiv. ursolic acid/g extract whereas the first yielded 5.2±0.6% and 285.7±31.2 mg equiv. ursolic acid/g extract. Under the optimum conditions, HPLC-DAD-ESI/MSn analysis confirmed the presence of a total of 24, 26 and 28 triterpenes in the extracts obtained by ME, UAE and SE, respectively. These results show the potential of *G. lucidum* as a source of bioactive compounds pointing out for their use in several industrial applications.

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