7TH PORTUGUESE YOUNG CHEMISTS MEETING

BOOK OF ABSTRACTS

19th – 21st May 2021

Bragança – Portugal

Title	Livro de Resumos do 7th Portuguese Young Chemists Meeting
Authors	Maria Inês Dias, Carla Pereira, José Pinela, Bruno Melgar
Support	Electronics
Support detail	PDF
Edition	1st Edition
Bar Code	
Editor	Sociedade Portuguesa de Química
Country	Portugal
E-mail	secretariado@spq.pt
Editor prefix	978-989-97667

COMMITTEES

❖ ORGANIZING COMMITTEE

Carla Pereira
José Pinela
Maria Inês Dias
Ângela Fernandes
Sandrina Heleno
Márcio Carocho
Cristina Caleja
Eliana Pereira
Filipa Reis
Bruno Melgar
Oludemi Taofiq

All from Centro de Investigação de Montanha- CIMO, IPB

❖ SCIENTIFIC COMMITTEE

Anthony J. Burke (Universidade de Évora)
Artur Silva (Universidade de Aveiro)
João F. Mano (Universidade de Aveiro)
Maria Beatriz Prior Pinto Oliveira (Universidade do Porto)
Nuno Mateus (Universidade do Porto)
Manuel A. Coimbra (Universidade de Aveiro)
Rui Fausto (Universidade de Coimbra)
Carlos J.R. Silva (Universidade do Minho)
Verónica de Zea Bermudez (Universidade de Trás-os-Montes e Alto Douro)
Fernanda Proença (Universidade do Minho)
Hélder Gomes (Instituto Politécnico de Bragança)
Ana Aguiar Ricardo (Universidade Nova de Lisboa)
Anthony J. Burke (Universidade de Évora)
Carlos M. Afonso (Universidade de Lisboa)
Mário Nuno Berberan e Santos (Universidade de Lisboa)
Lillian Barros (Instituto Politécnico de Bragança)

❖ SECRETARIAT

Leonardo Mendes
Cristina Campos

Analytical chemistry

PC1 Monitoring of 17 β-Estradiol in raw and treated waters of wastewater treatment plants

Nathalia S. Foureaux

PC2 An analytical approach to investigate blotting sands from Portuguese documents

Margarida Nunes

PC3 Studies of enantioseparation of promethazine and its metabolites using LC-UV/Vis

Maria Miguel Coelho

PC4 Relevance of iron content for *Escherichia coli* growth in drinking water

Cátia Gonçalves

Biochemistry

PC5 Fundamental understanding of physic-chemical proprieties of deep eutectic solvents

Monteiro H.

PC6 Antioxidant properties and protective effect of *Pistacia atlantica* Desf leaves on mercury-induced acute nephro-hepatotoxicity in rats

Benahmed Fatiha

Chemistry of Natural Products

PC7 Characterization of Algerian honeys by phenolic compounds LC-DAD-ESI/msn analysis: eucalyptus, jujube, spurge and multifloral

Seloua Kaid

PC8 Development of semi-solid formulations containing extracts of *Juglans regia* L. leaves for topical application

Nermine Besrour

PC9 Generation of a library of andrographolide derivatives as antibacterial agents

Bernardo Vieira

PC10 Phenolic profiles of horse chestnut (*Aesculus hippocastanum* L.) seed extracts obtained by ultrasound-assisted extraction

Carly Albiston

PC11 New semisynthetic derivatives of natural terpenoids extracted from *Euphorbia piscatoria*

Joana Ribeiro

PC12 Generation of small library of Amaryllidaceae-type alkaloids through isolation and molecular derivatization

Shirley Sancha

DEVELOPMENT OF SEMI-SOLID FORMULATIONS CONTAINING EXTRACTS OF *JUGLANS REGIA* L. LEAVES FOR TOPICAL APPLICATION

Nermine Besrour,[1] Yosra Chammakhi,[1] José Pinela,[1] Mohamed Mezni,[2] Cristina Caleja,[1] Carla Pereira,[1] Rui M.V. Abreu,[1] Maria José Alves,[1] Taofiq Oludemi,[1] Lillian Barros,[1] Olga Ferreira[1,*]

[1]Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal; [2]Universite Libre de Tunis, 32 Bis Av. Kheireddine Pacha 1002 Tunis, Tunisia.
*oferreira@ipb.pt

Nowadays, cosmetic brands are urged to follow sustainable development strategies via circular economy and low carbon footprint processes. Using ingredients from agri-food waste to generate new cosmetic products and environmentally friendly solvents are one of the paths to meet those challenges [1]. In this regard, glycerol and alkanediols can be seen as alternative solvents to extract phytochemicals from plant material due to their potential application in the cosmetics area. In this work, the leaves of walnut trees (*Juglans regia* L.) were studied as a source of bioactive compounds. Their extracts are already used in traditional herbal medicine but can be further valorised as potential bioactive ingredients in the cosmeceutical area. The extracts were obtained using aqueous solutions of ethanol or 1,2-propanediol, and diverse bioactivity studies (antioxidant, cytotoxic, anti-inflammatory, antimicrobial, anti-tyrosinase, and photostability) were carried out. Better results were obtained with the hydroethanolic extracts in the anti-tyrosinase, antioxidant, and anti-inflammatory dimensions. In the antimicrobial assay, both extracts showed similar microbial properties. The main phytochemicals identified in both extracts were 3-*O*-caffeoylquinic acid, quercetin-*O*-pentoside, taxifolin-*O*-pentoside isomer, quercetin 3-*O*-glucoside, and 3-*p*-coumaroylquinic acid.

After, the propanediol and hydroethanolic extracts were incorporated in a commercial base cream, aiming to design a formulation for topical application. The following parameters were studied to evaluate the stability of the final formulation: pH, colour, phenolic compounds content, and antioxidant activity. The formulation containing the hydroethanolic extract was the best to conserve the identified phenolic compounds for 30 days, at different temperature conditions (5 ºC, 20 ºC, and 40 ºC). The formulation containing the propanediol extract should be redesigned by incorporating higher amounts of extract. Both formulations presented relevant antioxidant activity and a favourable pH range of 3.8 to 4.7. These preliminary results suggest the potential application of *J. regia* extracts as an ingredient for incorporation into skin care products as they showed a very satisfactory chemical and physical stability at the studied time and temperature storage conditions. Nevertheless, additional studies will be performed not only to evaluate their stability over longer periods of time, but also their safety and toxicity.

References

[1] F. Chemat, M.A. Vian, H.K. Ravi, B. Khadhraoui, et al. Molecules, 24 (2019), 3007.

Acknowledgments

The authors are grateful to the Foundation for Science and Technology (FCT, Portugal) for financial support by national funds FCT/MCTES to CIMO (UIDB/00690/2020) and national funding by FCT, P.I., through the institutional and individual scientific employment program-contract for C. Pereira, L. Barros, and J. Pinela (CEECIND/01011/2018), respectively. This work was developed within the scope of the project AllNat (reference POCI-01-0145-FEDER-030463, PTDC/EQU-EPQ/30463/2017), funded by FEDER funds through COMPETE2020 – Programa Operacional Competitividade e Internacionalização (POCI), Portugal 2020 and by national funds through FCT/MCTES. O. Taofiq and C. Caleja are grateful to the Project Mobilizador Norte-01-0247-FEDER-024479: ValorNatural® and POCI-01-0145-FEDER-030463: AllNat for their contracts.