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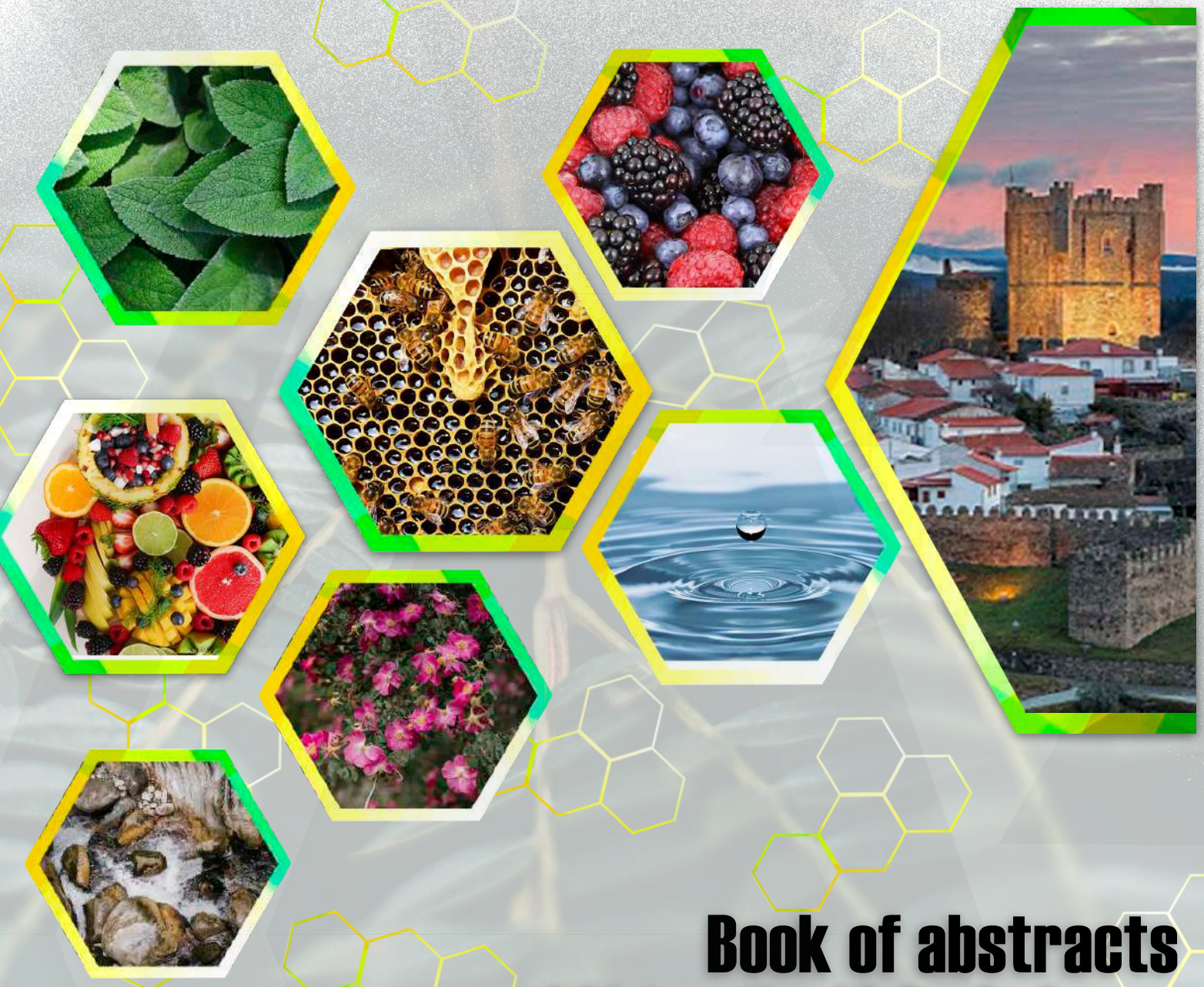

Book of abstracts

1st International Online Conference

4th - 5th February 2021

ipb INSTITUTO POLITÉCNICO DE BRAGANÇA

CIMO Centro de Investigação de Montanha

montanhas de investigação

AQUA VALOR

Title

1st Natural products application: Health, Cosmetic and Food: book of abstracts

Editors

[1]Lillian Barros

[1]Bruno Melgar Castañeda

[1]Carlos Seiti Hurtado Shiraishi

Suport

Eletronic

Format

PDF

Edition

Instituto Politécnico de Bragança (IPB)

http://www.ipb.pt

5300-253 Bragança, Portugal

Tel. (+351) 273 303 382

ISBN

978-972-745-286-6

URL

http://hdl.handle.net/10198/22068

PCF-50

Extraction of Phenolic compounds from *Artemisia absinthium* L.: otimization through ultrassound assisted extraction using the Response surface methodology

María Sol Terisotto[1,2], Bruno Melgar[1], Márcio Carocho[1], Maria Inês Dias[1], Ema Sabre[2], Sandrina A. Heleno[1*], Isabel C. F. R. Ferreira[1], Lillian Barros[1]

[1]Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal;
[2]Universidad Tecnológica Nacional, Facultad Regional Córdoba, X5000 Córdoba, Argentina;
*sheleno@ipb.pt

Plants throughout history have been a human resource available to be used for food and feeding and treatment of diseases, thus being considered as natural medicine agents. Plants are a huge source of secondary metabolites which have been described as strong health promoters and can be divided in primary metabolites, responsible for the processes of photosynthesis, respiration, solute transport, translocation, nutrient assimilation and differentiation; and secondary metabolites (terpenes, phenolic compounds, organic acids, among others), which are important for plant protection and pollination [1]. Recent studies have shown the relevant biological activities of phenolic compounds, consisting in their antioxidant, antimicrobial, and also cytotoxic effects activity. Among the medicinal plants it is possible to find the *Artemisia absinthium L.,* an aromatic plant [2], that grows in temperate regions of Europe, Asia and North Africa. In addition to the renowned wormwood application in preparation of absinth and related beverages, *A. absinthium* has been used since ancient times for medical purposes. From the ethnopharmacological point of view, this plant has been used for its antihelmintic, stomachic, antibacterial, antifeedant, antifertility, antipyretic, cytostatic, antitumor, and antimalarial actions [3].

This work intended to optimize the extraction parameters of the ultrasound assisted extraction to obtain highly enriched extracts in phenolic compounds. This was possible using the response surface methodology (RSM) that is able to model data within certain parameters chosen by the researcher, but prior to start running multiple experiments without knowing the behaviors of certain factors involved, this technique would be only able to visualize certain magnitudes and not all the optimum point, therefore, strong complex and random screening analysis have to be performed in order to work the RSM in the optimal conditions and be able to properly model datasets. Thus, 4 different screening analyses (Fractional Factorial design, 2 factors multilevel, and 1 factorial design) were developed using a 12-run array mixture which was randomized and codify using statistical software (Design Expert). Three factors were tested in this experiment (Power [50-100%], Solvent percentage [0-50%] and Time [20-600s]) and for the interpretation of the fractional factorial design factors were aliases and estimated as Intercept= Intercept + ABC; A= A + BC; B= B + AC; and C= C + AB. Data was processed through an ANOVA analysis employing Pareto plots and the least significant difference (LSD) test. The response analysis was achieved through the phenolic compounds content, analyzed by HPLC-DAD-Ms. According to the obtained results, the UAE ideal conditions for the screening analysis were 100% power, 20% ethanol and 240 s allowing a total phenolic content in the concentrations of 13.79 mg of TPC/g of extract, being chlorogenic acid derivatives, the main compounds. These results highlight the richness of *A. absinthium* in phenolic compounds and validate the UAE as an efficient extraction technology.

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Acknowledgments

Foundation for Science and Technology (FCT, Portugal) for financial support through national funds FCT/MCTES to the CIMO (UIDB/00690/2020). L. Barros and M. I. Dias thanks the national funding by FCT – Foundation for Science and Technology, P.I., through the institutional scientific employment program-contract for their contracts and, Sandrina A. Heleno and Márcio Carocho to the national funding by FCT – Foundation for Science and Technology, P.I., through the individual scientific employment program-contract. ERDF through the Regional Operational Program North 2020, within the scope of Project GreenHealth (Norte-01-0145-FEDER-000042).