



# Natural products application: Health, Cosmetic and Food

Provided by nature, adapted scientifically for industry



**Book of abstracts**  
**1st International Online Conference**  
**4th - 5th February 2021**

## Title

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

## Editors

<sup>1</sup>Lillian Barros

<sup>1</sup>Bruno Melgar Castañeda

<sup>1</sup>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>



## 1° Online Congress on Natural products application: Health, Cosmetic and Food

### Organizing Committee

**Lillian Barros**<sup>1,2,3</sup> - Instituto Politécnico de Bragança

**Alexandre Gonçalves**<sup>2</sup> - MORE

**Maria José Alves**<sup>2</sup> - Instituto Politécnico de Bragança

**Rui Abreu**<sup>2</sup> - Instituto Politécnico de Bragança

**Ricardo Calhella**<sup>2</sup> - Instituto Politécnico de Bragança

**Soraia Falcão**<sup>2</sup> - Instituto Politécnico de Bragança

**Bruno Melgar**<sup>3,4,5</sup> - Instituto Politécnico de Bragança

**Bruna Mara Machado Ribeiro**<sup>2</sup> - Universidade Federal do Ceará

**Carlos Seiti Hurtado Shiraishi**<sup>5</sup> - Instituto Politécnico de Bragança

<sup>1</sup>Congress Chair

<sup>2</sup>Keynotes curation

<sup>3</sup>Planning, Conceptualization, Execution

<sup>4</sup>Graphic design, Digital Strategy, Streaming

<sup>5</sup> L<sup>A</sup>T<sub>E</sub>X Formatting



## 1° Online Congress on Natural products application: Health, Cosmetic and Food

### **Scientific Committee**

Rosane Peralta - State University of Maringa

Manuela Pintado - Catholic University of Portugal

Jesús Simal - University of Vigo

Paola Perugini - University of Pavia

Eliana Souto - University of Coimbra

Joana Amaral - Instituto Politécnico de Bragança

Lillian Barros - Instituto Politécnico de Bragança

Maria José Alves - AquaValor

Ricardo Calhelha - Instituto Politécnico de Bragança

Alexandre Gonçalves - MORE



## OCF-02

## TOOLS TO DEVELOP DAIRY INGREDIENTS: BIOACTIVE AND PRESERVATIVE PURPOSES

Filipa A. Fernandes,<sup>1</sup> Dora Khouja,<sup>1,3</sup> Márcio Carcho,<sup>1</sup> Ricardo Calhelha,<sup>1</sup> Paula Rodrigues,<sup>1</sup> Khalil Zaghdoudi,<sup>3</sup> Lillian Barros<sup>1</sup>, Sandrina A. Heleno<sup>1\*</sup>, Isabel C. F. R. Ferreira<sup>1</sup>

<sup>1</sup>Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal;

<sup>2</sup>Grupo de Nutrición y Bromatología, Departamento de Química Analítica y Alimentaria, Facultad de Ciencias de Ourense, Universidad de Vigo-Ourense Campus, E-32004 Ourense, Spain;

<sup>3</sup>Université Libre de Tunis, 32 Avenue Kheireddine Pacha, Tunis 1002, Tunisia.

\*sheleno@ipb.pt

Phytosterols can be ingested and consequently absorbed by the human body, leading to a direct absorption competition with cholesterol, thus reducing its absorption [1]. Mushrooms are described as having several bioactive components, such as mycosterols (ergosterol), which, similarly to phytosterols, exhibit a strong hypocholesterolemic potential [2]. Thus, the objective of this work was to obtain mycosterol enriched extracts from *Agaricus bisporus* L. bio-waste for further incorporation in sheep cottage cheese, in order to develop a functional food with hypocholesterolemic effects. Sheep cottage cheeses with pure ergosterol, and a control cheese with no incorporation were prepared. The extracts were obtained by ultrasound assisted extraction (UAE) and the identification and quantification of their compounds was achieved through HPLC-UV. The toxicity and hypocholesterolemic activity were sought through a CaCo2 cell line. In terms of analysis, the nutritional value was analyzed according to AOAC procedures, the physical parameters included texture, external colour and water activity, and the microbial load (total aerobic mesophiles, enterobacteria, Psychrotrophic bacteria, yeasts, molds and *Staphylococcus aureus*) was also analyzed along a shelf life of 9 days according to the International Organization for Standardization (ISO) 6887-1:2003 [3,4]. No significant differences were verified for the nutritional parameters. The color of the cheeses incorporated with the extract hinted towards a browner tone when compared to the other two samples (cottage cheese with ergosterol and control cottage cheese). A dominance of palmitic acid followed by oleic and capric acids was detected, being the saturated fatty acids the predominant ones. Lactose and glucose were the two detected soluble sugars; being glucose only observed in cheese incorporated with *A. bisporus*, probably present in the extract. Also, the incorporations did not cause any significant alterations to normal microbial growth. Despite an increase of enterobacteria in the cheeses with the incorporation of the two agents, this increase was also verified for the control cottage cheese. CaCo2 cells absorbed 43.89% of cholesterol from the control cheese, while the cheese with pure ergosterol reduced cholesterol absorption by approximately 21.1%, and cheese with *A. bisporus* by approximately 30.24%. These results highlight the capacity of ergosterol to reduce the absorption of cholesterol, being an interesting candidate for the development of functional foods.

### References

- [1] F. Danesi, A. M. Gómez-Caravaca, D. de Biase, V. Verardo, A. Bordoni . Food Research International, 89 (2016) 1056–1063.
- [2] R. C. G. Corrêa, R. M. Peralta, A. Bracht, I. C. F. R. Ferreira, Trends in Food Science and Technology, 67 (2017) 19-35.
- [3] Official methods of analysis of AOAC International. W. Horwitz, USA, AOAC INTERNATIONAL, 2016.
- [4] Microbiology of food and animal feeding stuffs – Horizontal method for the enumeration of sulfite- reducing bacteria growing under anaerobic conditions. ISO,15213, 2003.

### Acknowledgments

Foundation for Science and Technology (FCT, Portugal) for financial support through national funds FCT/MCTES to the CIMO (UIDB/00690/2020) and to Filipa A. Fernandes PhD grant (SFRH/BD/145467/2019). L. Barros and C. Calhelha thank the national funding by FCT, P.I., through the institutional scientific employment program-contract. M. Carcho and Sandrina A. Heleno to the national funding by FCT, P.I., through the individual scientific employment program-contracts (CEECIND/00831/2018 and CEECIND/03040/2017). European Regional Development Fund (ERDF) through the Regional Operational Program North 2020, within the scope of Project Mobilizador Norte-01-0247-FEDER-024479: ValorNatural®.