

15<sup>th</sup> World Congress on

# POLYPHENOLS APPLICATIONS

September 28-30, 2022 - Valencia, Spain



INTERNATIONAL SOCIETY OF  
MICROBIOTA



Congress & Workshop Abstracts

# 15th World Congress on Polyphenols Applications

September 28 – 30, 2022

Valencia, Spain and Online

---

## **Prof. Andreas Schieber**

President of Polyphenols Applications World Congress

University of Bonn, Germany

## **Prof. Jan Frederik Stevens**

President of Cannabis 2022 Workshop

Oregon State University, USA

## **Prof. Francisco J. Barba**

President of the Local Organizing Committee

University of Valencia, Spain

---



The global abstract book is referenced as Polyphenols Applications 2022 World Congress.

Page 1- 156

# Welcome to Polyphenols Applications 2022

---

Dear Colleagues,

It is a great pleasure to welcome all of you to our 15th World Congress on Polyphenols Applications which will be held on September 28-30, 2022 at ADEIT 'Fundación Universitat', Valencia, Spain, & Online.

We wish that the 15th World Congress on Polyphenols Applications will be at least as exciting and as successful as our previous meetings.

**Hot topics which are going to be highlighted this year in Valencia include among others:**

Microbiota, metabolites, adipose tissue, nervous system, senolytic activity, ageing, endothelial function, radioprotection, oxidative stress, ferroptosis, cancer, atherosclerosis, extracellular vesicles, cannabinoids, cannabinoid receptors, anticancer activity, antiviral activity, anti-dyslipidemic effect, ocular delivery, cosmetic application, polyphenols recovery, extraction, valorization, fermentation, wine polyphenols, sensory aspects, inter-individual variability ...

**Cannabis 2022** a new workshop on "Medical Cannabis, Cannabinoids and Derivatives: Recent Advances and Applications" will be held under the direction of **Prof. Jan Frederik Stevens**. Cannabis 2022 aims to cover the cannabis constituents, their isolation, and their application in the medical sector and food industry.

We thank **Prof. Francisco J. Barba** and his team: *Juan Manuel Castagnini, Noelia Pallares and Francisco Juan Marti Quijal* for their great assistance as local organizers.

We would like to thank all speakers for their contribution. Their breadth of knowledge and expertise has helped make this conference as extraordinary as it is:

**Ramaroson Andriantsitohaina**, INSERM, France  
**Luke Busta**, University of Minnesota Duluth, USA  
**Mara Calleja**, University of Valencia, Spain  
**Franck Carbonero**, Washington State University-Spokane, USA  
**Juan Manuel Castagnini**, University of Valencia, Spain  
**Jan Claesen**, Cleveland Clinic, USA  
**Yolanda Diebold**, Universidad de Valladolid, Spain  
**Jennifer Durringer**, Oregon State University, USA  
**Juan Carlos Espin**, Spanish National Research Council, Spain  
**Jan Frank**, University of Hohenheim, Germany  
**Michael Gänzle**, University of Alberta, Canada  
**Pam Maher**, The Salk Institute for Biological Studies, USA  
**Francisco Juan Marti-Quijal**, University of Valencia, Spain  
**Nenad Naumovski**, University of Canberra, Australia  
**Nicole Nemetz**, University of Bonn, Germany  
**Elena Obrador**, University of Valencia, Spain  
**Naomi Osakabe**, Shibaura Institute of Technology, Japan  
**Noelia Pallarés**, University of Valencia, Spain

**Elke Richling**, University of Kaiserslautern, Germany  
**Ana Rodriguez-Mateos**, King's College London, United Kingdom  
**Sascha Rohn**, Technische Universität Berlin, Germany  
**Sonia Sentellas**, University of Barcelona, Spain  
**Susana Soares**, Universidade do Porto (FCUP), Portugal  
**Jan Frederik Stevens**, Oregon State University, USA  
**Yu Sun**, The Chinese Academy of Sciences, China  
**Guillermo Velasco**, Instituto de Investigación Sanitaria San Carlos, Spain  
**Jean-Paul Vincken**, Wageningen University & Research, The Netherlands  
**Fabian Weber**, University of Bonn, Germany  
**Qian Wu**, Hubei University of Technology, China

We wish to thank the International Society of Antioxidants in Nutrition and Health (ISANH) and the International Society of Microbiota (ISM) for their endorsement.

Thanks to our media partners **Elsevier** and **Wiley Online Library** for their support.

We wish to also thank the following companies for supporting Polyphenols Applications 2022: Silvateam, Bioquochem, Extrasynthese, Eldercraft, and MetaSci.

We hope that you will enjoy the Polyphenols 2022 Congress and that your interactions with your colleagues from many countries will stimulate a creative exchange of ideas and challenges.



**Prof. Andreas Schieber**  
President of Polyphenols Applications 2022  
University of Bonn, Germany

## A GREEN ALTERNATIVE APPROACH TO CITRUS PEEL BIO-WASTE DISPOSAL: CHARACTERISATION AND BIOACTIVE POTENTIAL

**Esther GÓMEZ MEJÍA (1)**, Jesús PALÁ-PAÚL (2), Custodio LOBO ROIZ (3), Sandrina A. HELENO (3),  
Ricardo C. CALHELHA (3), Maria Inês DIAS (3), Noelia ROSALES-CONRADO (1),  
María Eugenia LEÓN-GONZÁLEZ (1), Lillian BARROS (3), Yolanda MADRID (1)

- 1: Department of Analytical Chemistry, Faculty of Chemistry, Complutense University of Madrid, Spain  
2: Department of Biodiversity, Ecology and Evolution, Faculty of Biology, Complutense University of Madrid,  
Spain  
3: Centro de Investigação de Montanha (CIMO), Polytechnic Institute of Bragança, Portugal

egomez03@ucm.es

**Introduction:** Currently, there is a great interest in promoting circular economy perspectives for the recovery of value-added bioactive compounds, potentially exploitable as bioactive natural ingredients, from agri-food bioresidues that causes serious environmental problems. The citrus juice industry is a powerful manufacturing industry that generates huge amounts of waste, mainly peels [1-2].

**Material & Methods:** A hydrodistillation system was used for the extraction of essential oils, polyphenols and organic acids from lemon, clementine and orange peels, subsequently analysed by GC-MS, UPLC-DAD-ESI-MSn and UFLC-PDA respectively. Antioxidant, antimicrobial and/or cytotoxic activities were assessed.

**Results:** The aqueous extract was rich in polyphenols such as hesperidin and sinapoi-O-glucosido. It showed antioxidant (IC<sub>50</sub> TBARS = 0.98–1.4 mg/mL), antimicrobial (Staphylococcus aureus MIC = 2.5 mg/mL), and cytotoxic (AGS GI<sub>50</sub> = 83 ± 4 mg/mL) activities, especially lemon peels. The essential oils recovered from lemon and clementine peels were rich in limonene (63.6-33,7%), nerol (10,9%) and linalool (5,3%), showing the most antioxidant (IC<sub>50</sub> DPPH = 2.0 mg/mL) and antimicrobial (Campylobacter jejuni inhibition halo = 2.8 cm) potential.

**Conclusion:** This approach is simple and efficient for the integrated valorisation of citrus peel waste, promoting the recovery of bioactive compounds with potential applications in many industries.

*Supported by Madrid/FEDER program [S2018/BAA-4393, AVANSECAL II-CM]; the Spanish Science Ministry [PID2020-114714RB-I00], the Complutense University of Madrid through a pre-doctoral grant [CT17/17 - CT18/17], the Foundation for Science and Technology (FCT, Portugal) by national funds FCT/MCTES to CIMO (UIDB/00690/2020); the C.L. Roriz PhD's grant (SFRH/BD/117995/2016), the contracts of M.I. Dias, R.C. Calhelha, and L. Barros through the institutional scientific employment program-contract and S.A. Heleno (CEECIND/03040/2017) through the individual scientific employment program-contract.*

### References:

1. Gómez-Mejía et al., *Food Chem.*, 295 (2019) 289-299
2. Hilali et al., *ACS Sustain. Chem. Eng.*, 7(13) (2019) 11815-11822