



Natural products application: Health, Cosmetic and Food

Provided by nature, adapted scientifically for industry



Book of abstracts
1st International Online Conference
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1st Natural products application: Health, Cosmetic and Food: book of abstracts

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

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The Mountain Research Center is one of the 5 research centers within the Polytechnic Institute of Bragança and is an RD unit of excellence. CIMO conducts research on the Mediterranean mountain systems following an interdisciplinary strategy that goes from Nature to Products.

In all these years, we have had the commitment of disseminating science around the world, creating solid and robust bonds and partnerships with both, academia and industry, and we are always looking for more challenging collaborations.

In this sense, the mountain research center gathers different ways to keep evolving in our main mission of science dissemination, especially now during this difficult pandemic situation, in which science dissemination has been extremely affected.

Therefore, one of our responses was the creation of the first edition of the Natural Product Applications Online Congress, which consists in the dissemination of research using natural products applied in 3 different areas: cosmetic, food, and health.

Thanks to all of you in less than a month the congress reached more than 483 registration from universities and important companies from different parts of the world, such as Algeria, Argentina, Brazil, Colombia, France, Greece, Italy, Mexico, Netherlands, Poland, Russia, Serbia, Slovenia, Spain, Ukraine, and USA.

The NPA congress received and processed more than 211 communications, from which the scientific committee has selected the most appropriate for each type of communication, considering the limited time we have for this conference.

All the submitted works were divided into three main categories, Oral, Pitch, and Poster communications, which will join 9 Keynote lectures and one invited oral communication, to which, we would also like to thank for their availability and for accepting this invitation.

We could not thank you more for your participation, and we hope to see you next year on the second edition of the Natural Product Applications Congress.

NPA Team.

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PCF-76

DEVELOPMENT OF BIO-BASED INGREDIENTS FROM UNDERUSED TREES AND SHRUB SPECIES FOR INDUSTRIAL APPLICATION

Virginie Xavier,^{1,2} Sandrina Heleno,¹ Miguel A. Prieto², Joana Amaral¹, Irene Mediavilla Ruiz³, Luis Saul Esteban Pascual³, Isabel C.F.R. Ferreira¹, Lillian Barros,^{1*}

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Around the world, the strategies of companies and governments are increasingly converging around the concept of using biomass in industry. Besides the benefit from moving away from fossil-based raw materials, the use of natural matrices bring health properties and functionalities to the final products and is desirable from a circular economy perspective. This is leading industries like the food, cosmetic and pharmaceutical to look for bio-based ingredients to obtain these bio-based products [1].

To not compete with the current use of biomass, one strategy to obtain these natural ingredients could be the use of underutilized species cultivated in marginal lands. This research has different purposes such as the chemical characterization of selected natural matrices from Germany, Spain and Romania (*Betula pendula*, *Calluna vulgaris*, *Carpinus betulus*, *Cistus ladanifer*, *Cupressus sempervirens*, *Cytisus scoparius*, *Euonymus europaeus*, *Hippophae rhamnoides*, *Juniperus communis*, *Populus nigra*, *Robinia pseudoacacia*, *Rosmarinus officinalis*, *Rubus fruticosus*, *Spartium junceum*, *Ulmus minor* and *Ulmus pumila*) to know and improve the contents in the target compounds (triterpenoids, phenolic compounds, including flavonoids and proanthocyanidins, hydrosoluble tannins, among others). After the chemical characterization, the extraction procedures can be optimized using experimental design tools based on response surface models to obtain high yields and highly pure essential oils and polar extracts. The obtained responses will be monitored based on extraction yield and HPLC-DAD-MS analysis. The optimized extracts in the target compounds will be refined using membrane technologies in ultrafiltration processes, semi-preparative and preparative chromatography, selective precipitation and crystallization, adsorbent bed purification to obtain purified fractions or isolated compounds. To monitor the efficiency of each process and select the most adequate methodology, HPLC-DAD will be applied. From the final extracts and/or isolated compounds, a fully characterization of the bioactive potential will be done, namely through the antioxidant, antimicrobial, cytotoxic, and anti-inflammatory properties.

From these bioactive screening, each developed extract and/or isolated compound will be analyzed according to different market requirements and regulatory documents to determine their applications as nutraceuticals, plant-based medicaments, feed additives and cosmetic ingredients.

References

[1] Cho, E. J., Trinh, L. T. P., Song, Y., Lee, Y. G., & Bae, H. J. (2020). Bioconversion of biomass waste into high value chemicals. *Bioresource Technology*, 298.

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