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

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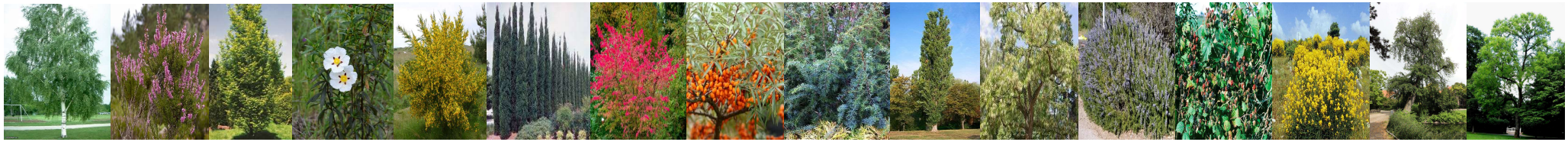
INTRODUCTION

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 pharmaceutic 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 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 to know and improve the contents in the target compounds.

MATERIALS AND METHODOLOGY



Betula pendula L. | *Calluna vulgaris* L. | *Carpinus betulus* L. | *Cistus ladanifer* L. | *Cytisus scoparius* L. | *Cupressus sempervirens* L. | *Euonymus europaeus* L. | *Hippophae rhamnoides* L. | *Juniperus communis* L. | *Populus nigra* L. | *Robinia pseudoacacia* L. | *Rosmarinus officinalis* L. | *Rubus fruticosus* L. | *Spartium junceum* L. | *Ulmus minor* Mill. | *Ulmus pumila* L.

CHEMICAL CHARACTERIZATION

- TERPENOIDS
- PHENOLIC COMPOUNDS
- FLAVONOIDS HYDROSOLUBLE and CONDENSED TANNINS

EXTRACTION OPTIMIZATION

EXPERIMENTAL DESIGN TOOLS BASED ON RESPONSE SURFACE MODELS

YIELD HPLC-DAD-MS

REFINE

HIGHLY PURE ESSENTIAL OIL AND POLAR EXTRACTS

MEMBRANE TECHNOLOGIES

ULTRAFILTRATION PROCESSES, SEMI-PREPARATIVE AND PREPARATIVE CHROMATOGRAPHY, SELECTIVE PRECIPITATION, CRYSTALLIZATION AND ADSORBENT BED PURIFICATION

SELECTION OF THE BEST TECHNOLOGY

HPLC-DAD

PURIFIED FRACTION ISOLATED COMPOUNDS

BIOACTIVE POTENCIAL

- ANTIOXIDANT
- ANTIMICROBIAL
- CYTOTOXIC
- ANTI-INFLAMMATORY

APPLICATIONS

- NUTRACEUTICALS
- PLANT-BASED MEDICAMENTS
- FEED ADDITIVES
- COSMETIC INGREDIENTS

MARKET REQUIREMENTS

REGULATORY DOCUMENTS

RESULTS AND CONCLUSIONS

The results obtained in the present study may serve to add knowledge in the field of valorization of unexploited species through the application of bio-based products in industries like the food and cosmetic as natural-based preservatives and bioactive agents.

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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