

#699 / Poster

TOPIC : Waste and side streams valorization

## **Sustainable Antioxidants Recovery from *Gnaphalium viscosum* (Kunth) applying a Portfolio of Extraction Techniques**

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### **PURPOSE OF THE ABSTRACT**

*Gnaphalium* L. is a genus of flowering plants, commonly called cudweeds, which includes approximately 200 species of the Compositae (Asteraceae) family. It is widespread in temperate and subtropical regions. Of the *Gnaphalium* genus, at least 26 species are called “Gordolobo”, also known in English as Mexican Mullein.

The plant is a storehouse of vital secondary metabolites, in particular phenolic compounds with biological activities, which makes it a sustainable resource with possible applications in food, nutraceutical, pharmaceutical, cosmetic industries. Furthermore, as a resilient plant contributing to soil restoration, supporting biodiversity, and promoting ecological conservation, it has economic potential through valorization in nutraceuticals, herbal formulations, and sustainable agriculture (1,2).

This study boldly explores the remarkable potential of *Gnaphalium viscosum* (Kunth), a plentiful biomass that remains untapped mainly in today's applications. By examining a range of extraction techniques, including the tried-and-true two-phase solvent and Soxhlet methodologies, as well as the innovative supercritical extraction—with and without cosolvents—we aim to uncover the actual value of this plant. Operating within an optimized temperature range of 40 to 60 °C and pressures of 30 to 50 MPa, our research seeks to unlock the diverse and beneficial phytochemicals in the leaves, flowers, and stems of *G. viscosum*. The findings of our research open ways to new applications and highlight the significance of this often-overlooked resource, driving interest and investment in its exploitation.

The efficiency of the techniques was assessed and compared based on yield, the influence of the solvents used, total phenolic content, and antioxidant activity of the extracts. Phenolics of contrasting complexities were identified and quantified using LC (LC–MS/MS and LC–HRAM), while the fatty acid profile was determined by GC–FID. The results of this extensive study demonstrated the great worth and remarkable valorization perspectives of *G. viscosum*, as highly potent antioxidants such as kaempferol, kaempferol-3-O- $\beta$ -d-glucoside (astragalín), and chlorogenic acid were identified in notable amounts.

Moreover, essential representatives of phenolic acids (hydroxycinnamic and caffeoylquinic acid derivatives),

hydroxybenzoic acid derivatives, and flavonoids, flavones, flavan-3-ols, flavanones and proanthocyanidins were determined. In addition, the powerful antioxidants, leontopodic acid A and B, highly substituted derivatives of glucaric acid, with multiple applications, were identified and quantified in the species for the first time (3). This results of the extensive experimental work for *G. viscosum* extracts recovery, their characterization, and antioxidant capacity evaluation represents a significant contribution in pushing forward the knowledge boundaries about the potential of this biomass and the prospects for its efficient valorization.

## FIGURES

### FIGURE 1

### FIGURE 2

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## KEYWORDS

*Gnaphalium* L. | biomass valorization | antioxidants | phytochemicals

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## BIBLIOGRAPHY

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