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FROM *CANNABIS SATIVA* L. (CANNABACEAE) BY-PRODUCTS TO BIOACTIVE AGENTS: EXTRACTION AND BIOLOGICAL POTENTIAL

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1 RESEARCH CONTEXT

In the last few years, interest on hemp has renewed thanks to the availability of non-psychotropic varieties, allowing for the revival of studies and applications.

The project:

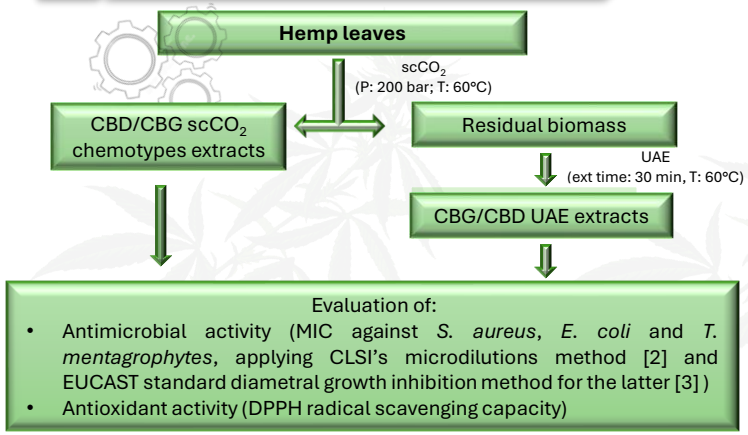
NOrCa "NOrCa - Not Ordinary Cannabis" PRIN 2022 PNRR

Exploring the chemical space around hemp (*Cannabis sativa* L.) waste and by-products from a circular economy perspective.

The main character:

Aerial parts of non-psychotropic hemp, a byproduct of industrial seed cleaning, were provided by Canvasalus.

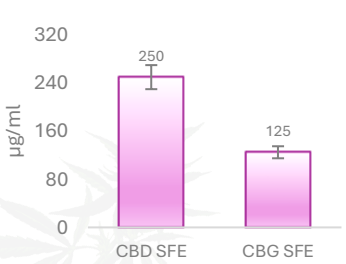
2 METHODOLOGY



3 RESULTS

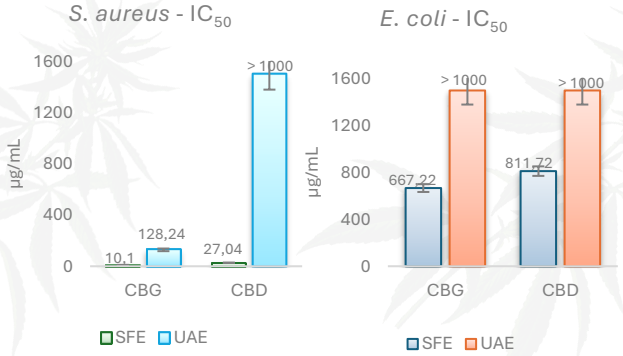
Antibacterial activity

The antimicrobial efficacy was influenced by the extraction method used. CBG and CBD extracts obtained via $scCO_2$ showed significantly lower MIC and IC_{50} values compared to UAE extracts. For instance, against *S. aureus*, $scCO_2$ extracts of CBG and CBD exhibited MICs of 50 and 100 µg/mL, respectively, with IC_{50} values of 10.102 and 27.045 µg/mL. Conversely, UAE extracts showed MICs of 500 µg/mL (CBG) and only 42.41% growth inhibition for CBD. A similar trend was observed for *E. coli*.



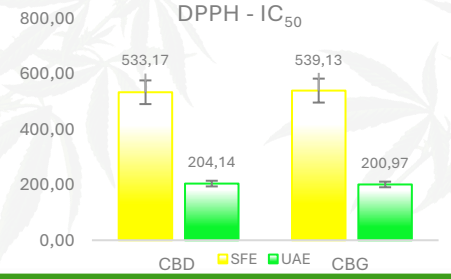
Antioxidant activity

UAE extracts showed a higher effectiveness, exhibiting IC_{50} values of 200.97 ± 11.19 µg/mL for CBG and 204.14 ± 12.21 µg/mL for CBD. In contrast, SFE extracts yielded IC_{50} values of 539.13 ± 46.37 and 533.17 ± 52.17 µg/mL for CBG and CBD extracted by SFE, respectively.



Antifungal activity

Employing the EUCAST standard method, maximum growth inhibition of 60.25 ± 1.36 % was observed after 14 days at 500 µg/mL. Indeed, microdilution tests pointed out MICs values of 250 µg/mL for CBD and 125 µg/mL for CBG regarding $scCO_2$ extracts, while UAE extracts showed no inhibition.



4 CONCLUSIONS

Antioxidant activity

There is almost no difference between both the two chemotypes and the extraction methods, although $scCO_2$ extracts exhibited a DPPH radical scavenging capacity higher than UAE.

Antimicrobial activity

The battery of tests pointed out a significant variation depending on the cannabis chemotype and on the extraction approach performed on the plant material.

5 AKNOWLEDGEMENTS

CANVASALUS® RESEARCH

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3) The European Committee on Antimicrobial Susceptibility Testing.Routine and extended internal quality control for MIC determination and agar dilution for yeasts, moulds and dermatophytes as recommended by EUCAST. Version 7.0, 2023. http://www.eucast.org.

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