IECAN 2025 Conference

The 2nd International Electronic Conference on Antioxidants

07–09 April 2025 | Online

MDPI

ECO-FRIENDLY ULTRASOUND-ASSISTED EXTRACTION OF QUERCETIN FROM CICHORIUM INTYBUS USING NADESs AND COMMERCIAL SOLVENTS

Filip Balaz, Ana Bojic, Katarina Arapovic, Ana Tomas Petrovic, Emilia Gligoric, Nevena Grujic-Letic, Branislava Teofilovic

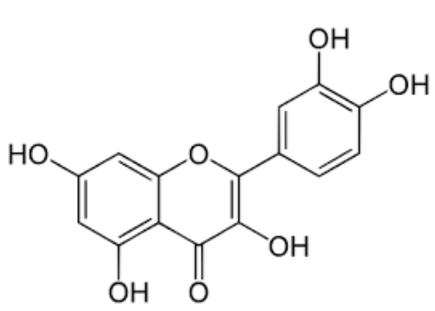
University of Novi Sad, Faculty of Medicine, Hajduk Veljkova 3, 21000 Novi Sad, Serbia

*Corresponding author: Filip Balaz, 904010d23@mf.uns.ac.rs

INTRODUCTION & AIM

Cichorium intybus, a medicinal plant, is valued for its bioactive compounds, such as flavonoids, phenolic acids, and other phytochemicals. In particular, quercetin is a flavonoid with potent antioxidant properties that combat oxidative stress and aid in preventing chronic diseases. Additionally, quercetin exhibits anti-inflammatory, antihistaminic, and immunomodulatory effects, making it a popular choice for promoting overall health.

EXTRACTION

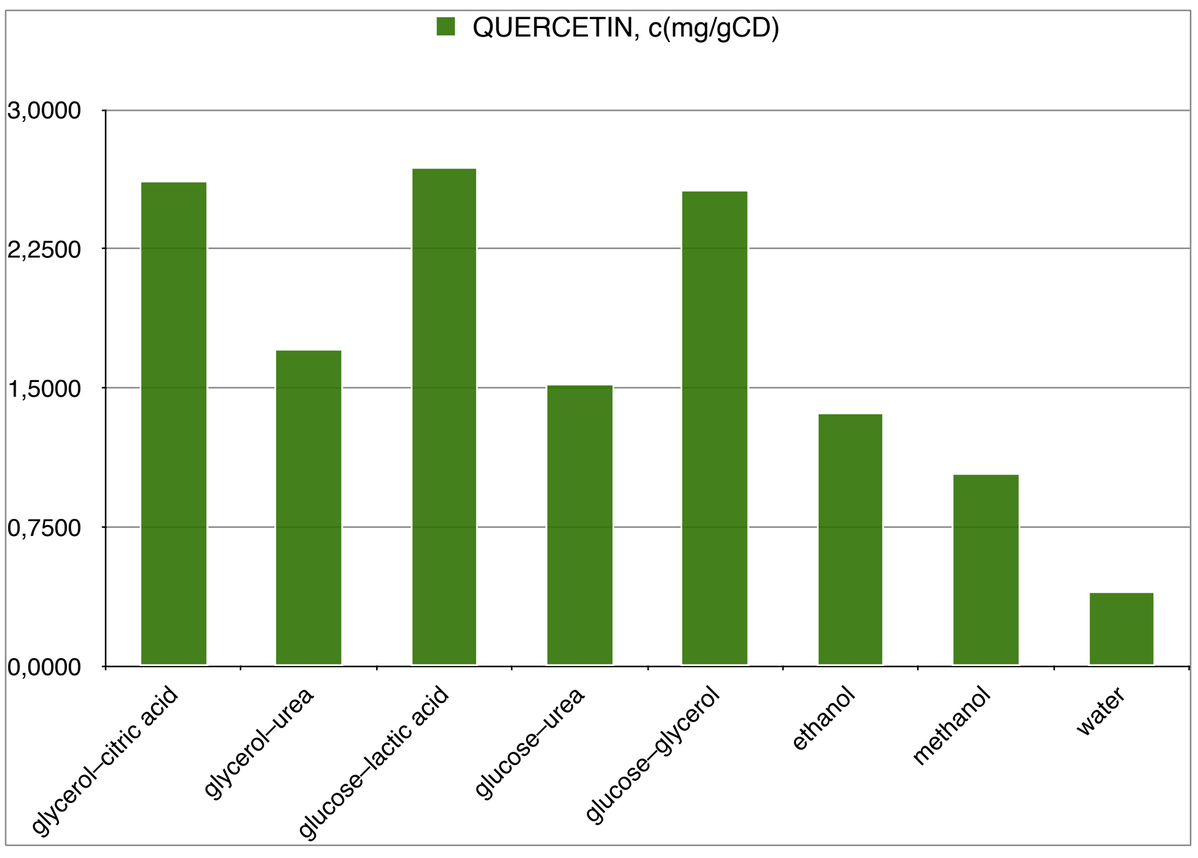


METHOD

The objective of this study was to compare the extraction efficiency of quercetin using natural deep eutectic solvents (NADESs) based on glucose and glycerol with commercial solvents from the aerial parts of Cichorium intybus cultivated at the Institute “Dr. Josif Pančić.” Extraction was performed using eight solvents: five NADES formulations (glycerol–citric acid 1:1, glycerol–urea 1:1, glucose–lactic acid 1:1, glucose–urea 1:2, and glucose–glycerol 1:2) and three commercial solvents (water, ethanol, and methanol). Quercetin content was quantified using ultrasonic-assisted extraction. All NADESs outperformed the commercial solvents in extracting quercetin.

RESULTS & DISCUSSION

All NADESs outperformed the commercial solvents in extracting quercetin. The quercetin content extracted using NADESs ranged from 1.52 to 2.69 mg/g of crude drug, with the glucose–lactic acid NADES yielding the highest quercetin content at 2.69 mg/g of crude drug. In contrast, the quercetin levels obtained with commercial solvents ranged from 0.40 to 1.37 mg/g of crude drug.



CONCLUSION

The NADESs demonstrated remarkable efficiency in extracting bioactive compounds such as quercetin due to their tunable physicochemical properties, including high polarity and hydrogen bonding capacity, which enhance solubility and selectivity.

FUTURE WORK / REFERENCES

Acknowledgement: This work is supported by Provincial Secretariat for Higher Education and Scientific Research, Province of Vojvodina (Grant No. 003077388 2024 09418 003).