

ANTIOXIDANT AND NEUROPROTECTIVE ACTIVITY OF *HELICHRYSUM ITALICUM* EXTRACTS OBTAINED BY MODERN AND CONVENTIONAL EXTRACTION TECHNIQUES

Vladislava Nebrigić¹, Milena Terzić¹, Gökhan Zengin², Marija Radojković¹

¹Faculty of Technology, University of Novi Sad, Novi Sad, Serbia,

²Selçuk Üniversitesi, Fen Fakültesi Biyoloji Bölümü, Kampüs/Konya, Turkey

INTRODUCTION

Helichrysum italicum (Roth) G. Don is a medicinal plant with promising pharmacological activities. In recent years, it has been showed that bioactive compounds from plants and plant extracts can improve cognitive functions in neurodegenerative conditions. One of the good therapeutic target for the treatment and/or management of Alzheimer and Parkinson diseases could be inhibition of cholinesterases. Furthermore, oxidative stress which is induced by the formation of free radicals may impair endogenous antioxidant defence and take part in the progression of many neurodegenerative diseases. Thus, screening of plant extracts for their property as antioxidants and to inhibit enzymes is considered as a promising tool in the discovery of lead molecules against targeted diseases.



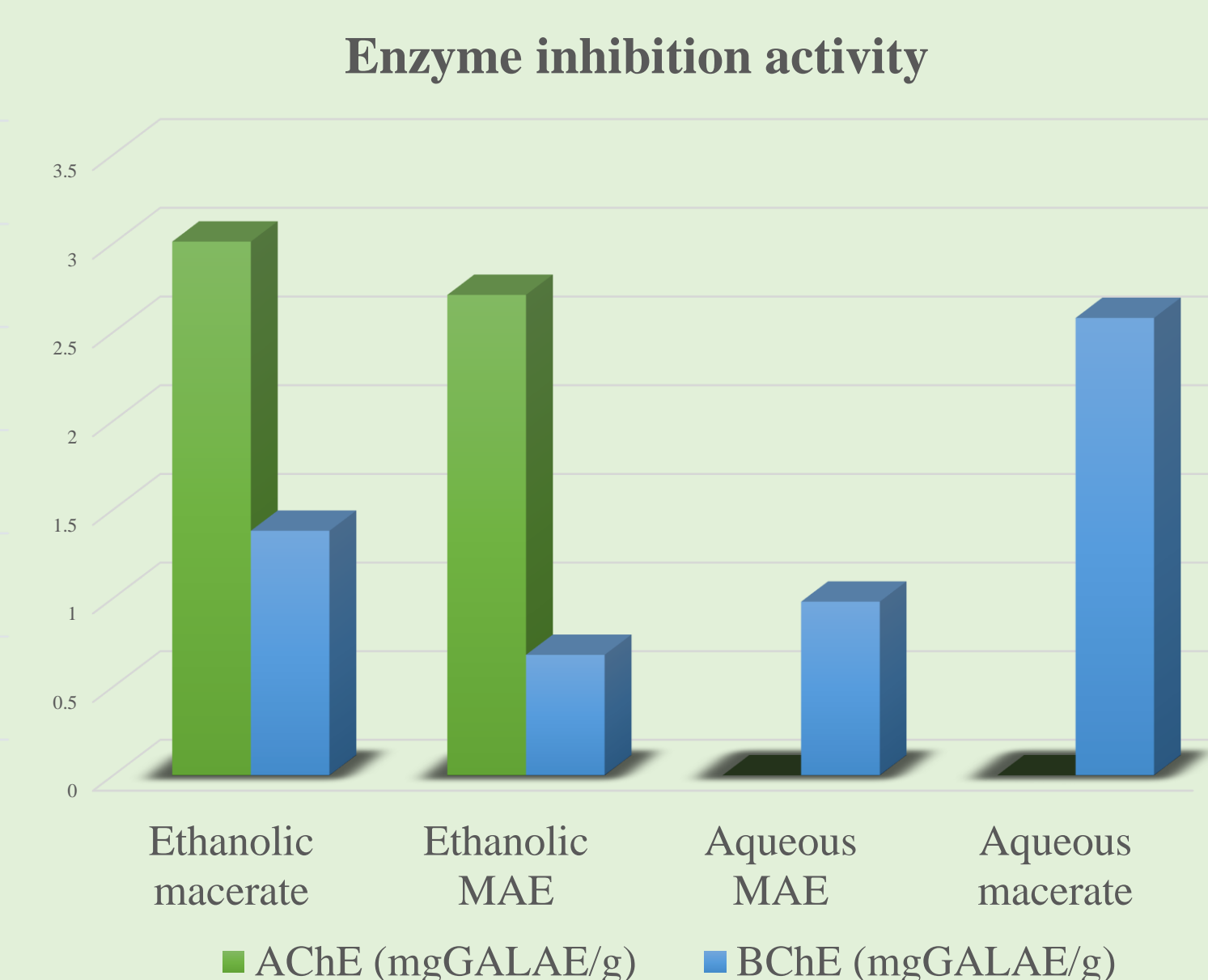
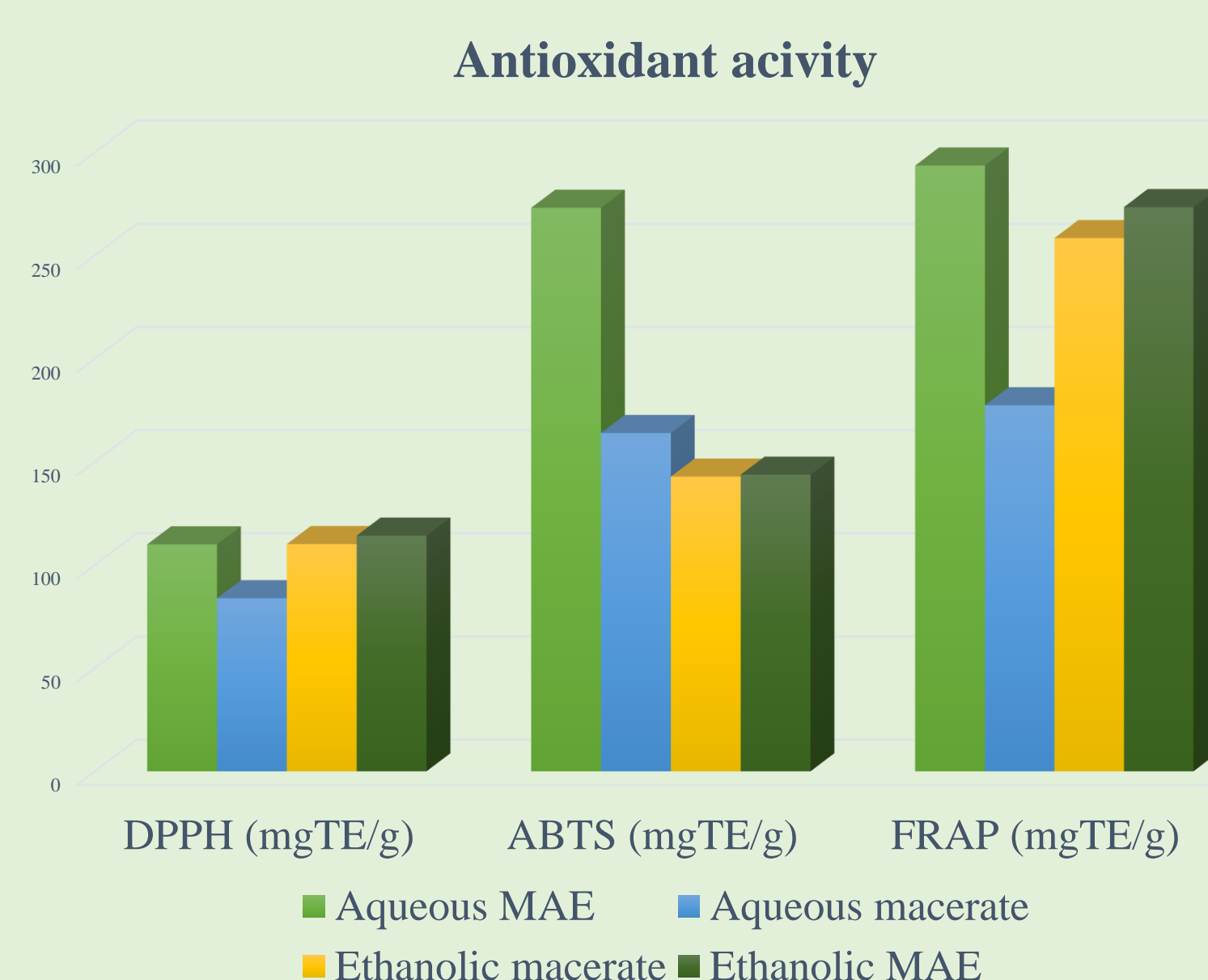
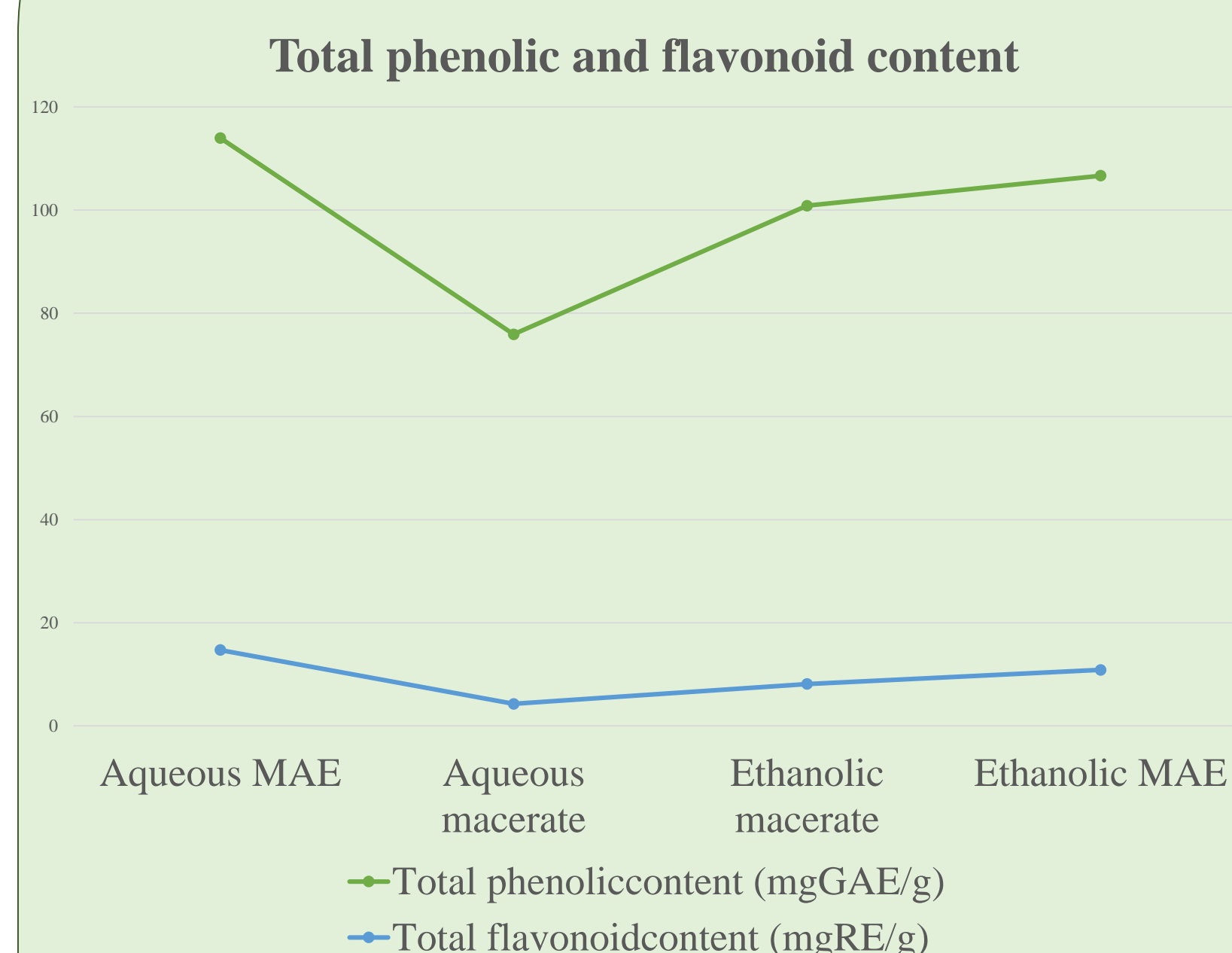
OBJECTIVES

The aim of this study was to determine is there possibility for implementation of *Helichrysum* extracts as potential supplementary therapy in management of neurodegenerative diseases.

METHOD

Extract was obtained using traditional (maceration) and modern extraction techniques (microwave-assisted extraction-MAE), where water and 50% ethanol were used as solvent. Antioxidant potential was analyzed using three different *in vitro* antioxidant assays which included antiradical (DPPH• and ABTS•⁺) and reducing power (FRAP) assays. Enzyme inhibitory effects were tested against acetylcholinesterase (AChE) and butrylcholinesterase (BChE).

RESULTS



The highest phenolic (113.97 mg GAE/g) and flavonoid (14.73 mg RE/g) had aqueous MAE extract.

In antioxidant assays aqueous MAE extract had the highest antiradical activity against ABTS⁺ (273.11 mg TE/g) radical and strongest capacity to reduce Fe³⁺ ion (FRAP 293.62 mgTE/g) than other extracts, while activity against DPPH radical was also high. The aqueous macerate, with lowest phenolic content, showed the weakest antioxidant activity.

The ethanolic extract obtained by maceration had higher AChE inhibitory activity (3.01 GALAE/g), than ethanolic MAE extract (2.71 GALAE/g). Aqueous MAE extract and macerate did not show inhibitory effect on AChE activity. Similarly, the ethanolic macerate (1.38 GALAE/g) also had higher inhibitory effect on BChE activity than the MAE extract (0.68 GALAE/g). As opposite to other investigations, strongest inhibition activity of BChE showed aqueous macerate (2.58 GALAE/g).

CONCLUSION

According to the obtained results it was shown that *Helichrysum italicum* could be a rich natural source of bioactive agents.