

Seasonality of the brown seaweed *Halopteris scoparia* extracts' antioxidation potential



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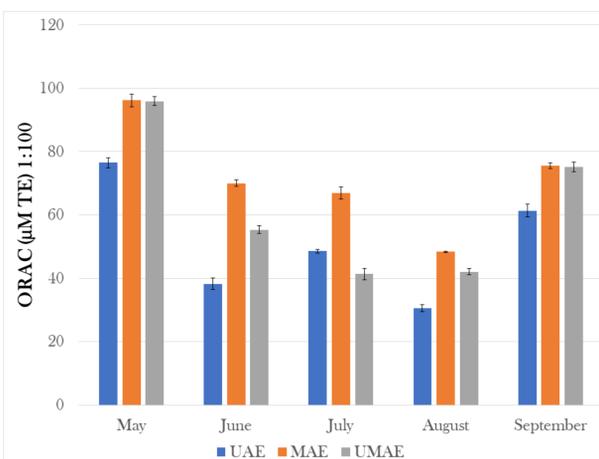
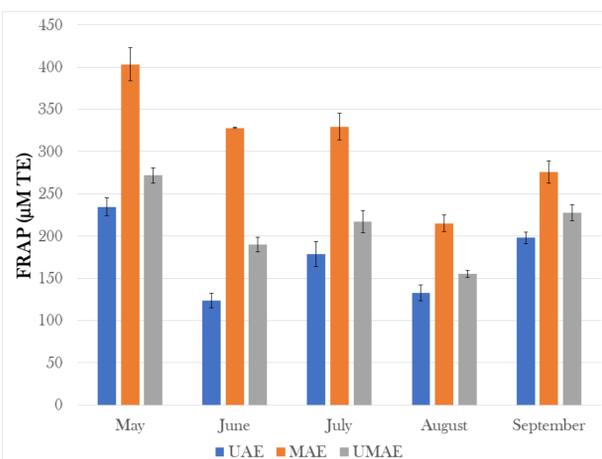
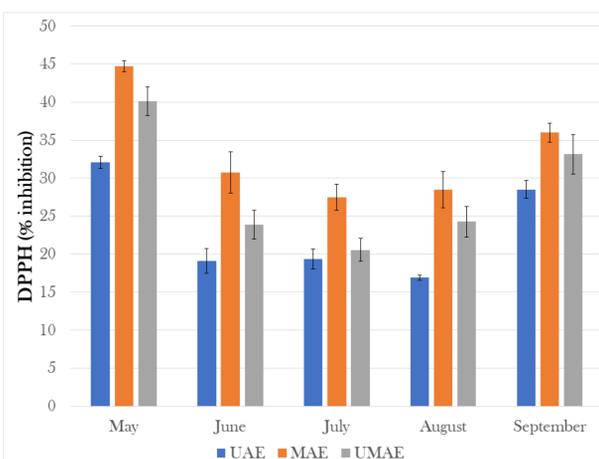
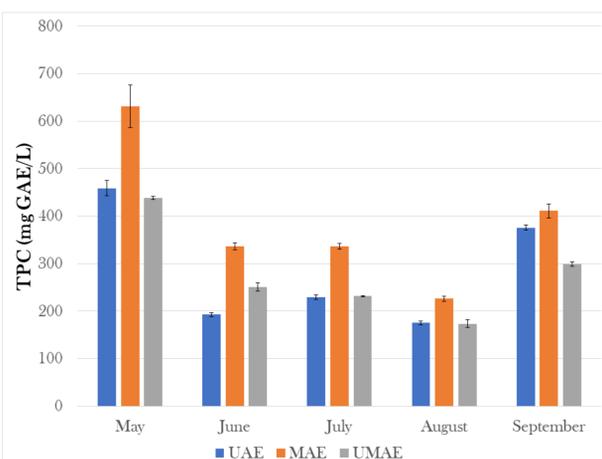
INTRODUCTION

Recently, researchers are drawn to investigate seaweeds as a source of compounds with various biological activities. Seaweeds produce phytochemicals as a response to the fluctuation of various environmental factors such as salinity, temperature, UV radiation, nutrient availability, and predators' activity. The brown seaweeds have been reported to contain phytochemicals responsible for antioxidant activity, namely phenolics. Besides, novel green extraction methods are being used to improve the extraction of phenolics from seaweeds.

This study was conducted to investigate the influence of different extraction methods on the total phenolic content (TPC) and antioxidant activity of brown seaweed *Halopteris scoparia* extracts during seasonal growth (May to September).



RESULTS



METHODS

H. scoparia was collected off the south coast of the island Čiovo in the Adriatic Sea from May to September.

Freeze-dried seaweed powders were extracted using 3 different extractions in 50% ethanol at 60 °C:

- Ultrasound-assisted extraction (UAE) was performed using an ultrasonic bath at 40 kHz frequency for 1 hour,

- Microwave-assisted extraction (MAE) was performed in an advanced microwave extraction system at 200W for 15 minutes,

- Ultrasound/microwave-assisted extraction (UMAE) was performed as UAE and MAE combined.

Total phenolic content (TPC) of *H. scoparia* extracts was determined using Folin-Ciocalteu method.

Antioxidant activity was determined using three different methods, ferric reducing/antioxidant power (FRAP), 2,2-diphenyl-1-picrylhydrazyl radical scavenging ability (DPPH), and oxygen radical absorbance capacity (ORAC).

CONCLUSIONS

- The TPC of extracts ranged from 173,33 to 631,67 mg gallic acid equivalents per liter (GAE/L).
- The highest TPC and antioxidant activity expressed with FRAP, DPPH and ORAC methods was observed for May samples.
- When comparing used green extraction methods, the best extraction method for obtaining extracts with high phenolic content and antioxidant activity was MAE.
- Results show evidence of seasonality in antioxidant activity.
- Further studies are needed for the identification of specific compounds that are responsible for biological activity in this brown seaweed.



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