



# Sustainable Recovery of Bioactive Compounds from Grape Pomace Using Conventional and Microwave-Assisted Extraction

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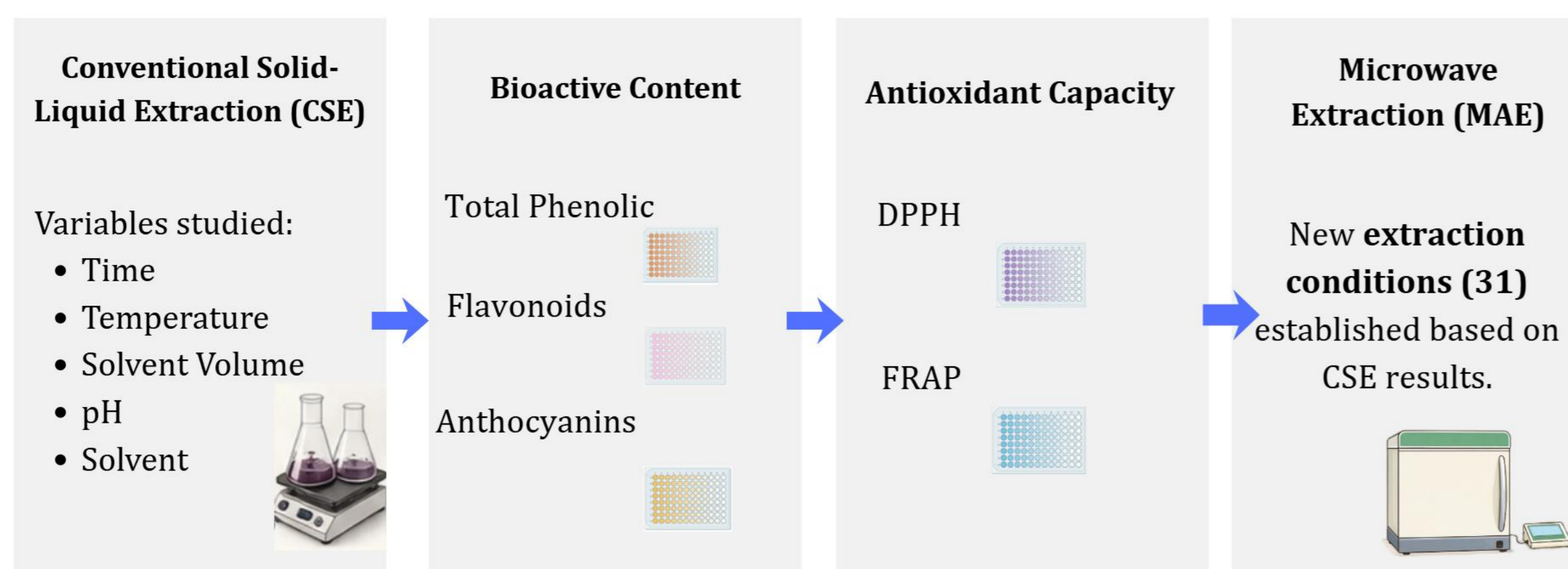
## Introduction

Wine production is one of the most important agricultural activities worldwide. In addition to large annual wine production volumes, it also generates waste, notably grape pomace (GP). Traditionally regarded as waste, this residue has been reanalyzed from the perspective of bioeconomy and circular economy principles, proving to be a rich source of bioactive compounds with great valorization potential [1]. Its heterogeneous composition includes a variety of polyphenols, dietary fibers, flavonoids, and other secondary metabolites that give to GP biological properties such as antioxidant, anti-inflammatory, and antimicrobial activities. To promote GP valorization, it is of utmost importance to optimize extraction methodologies to obtain the bioactive compounds responsible for these properties.

## Objective

Optimization of extraction methodologies for grape pomace valorization.

## Material and methods



## Conclusion

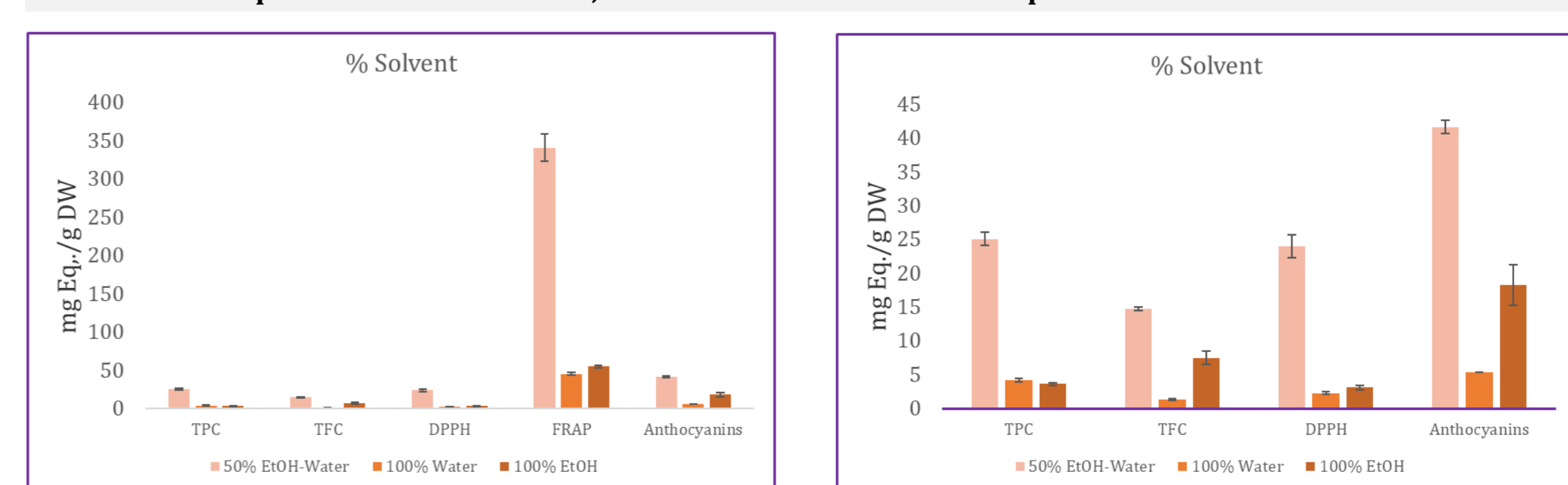
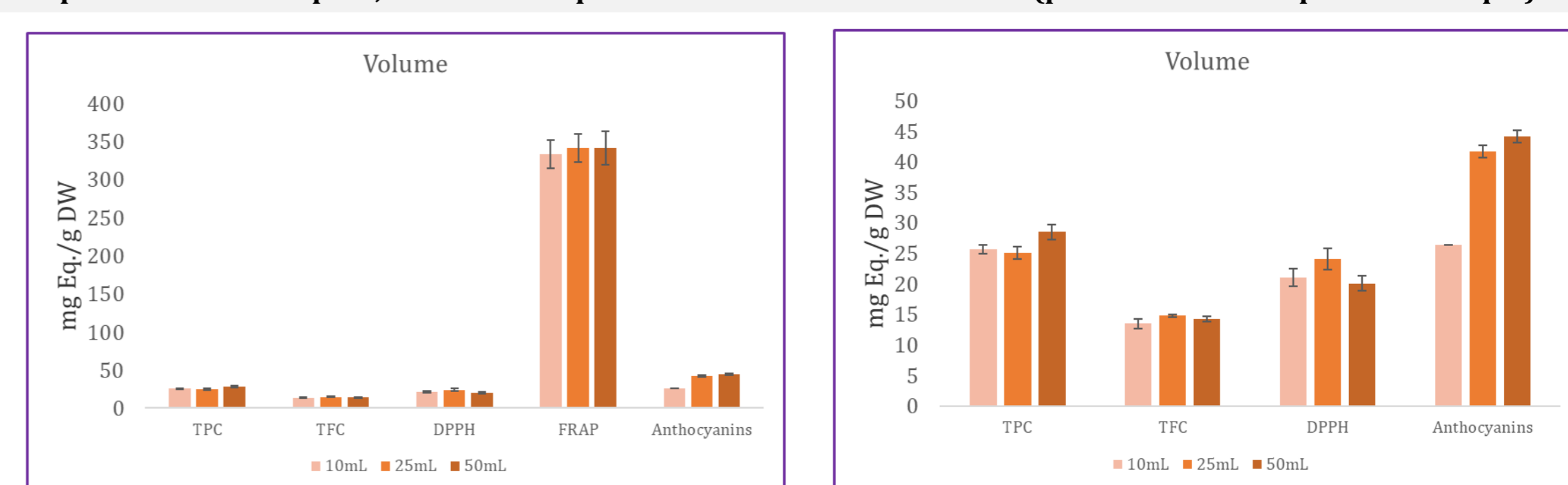
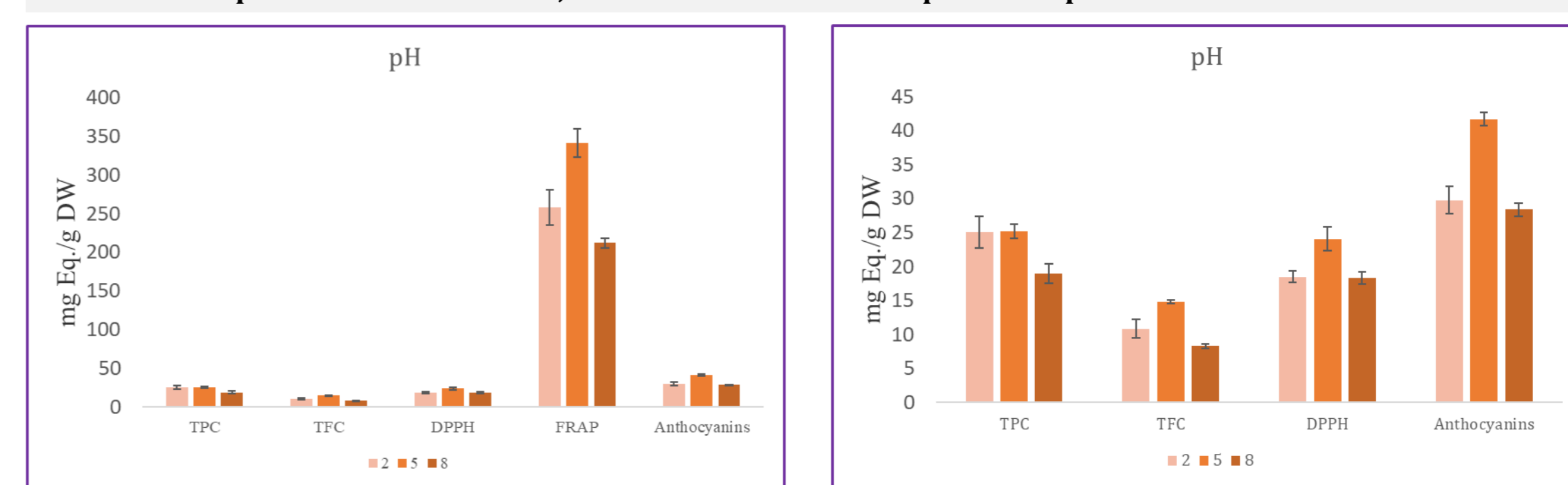
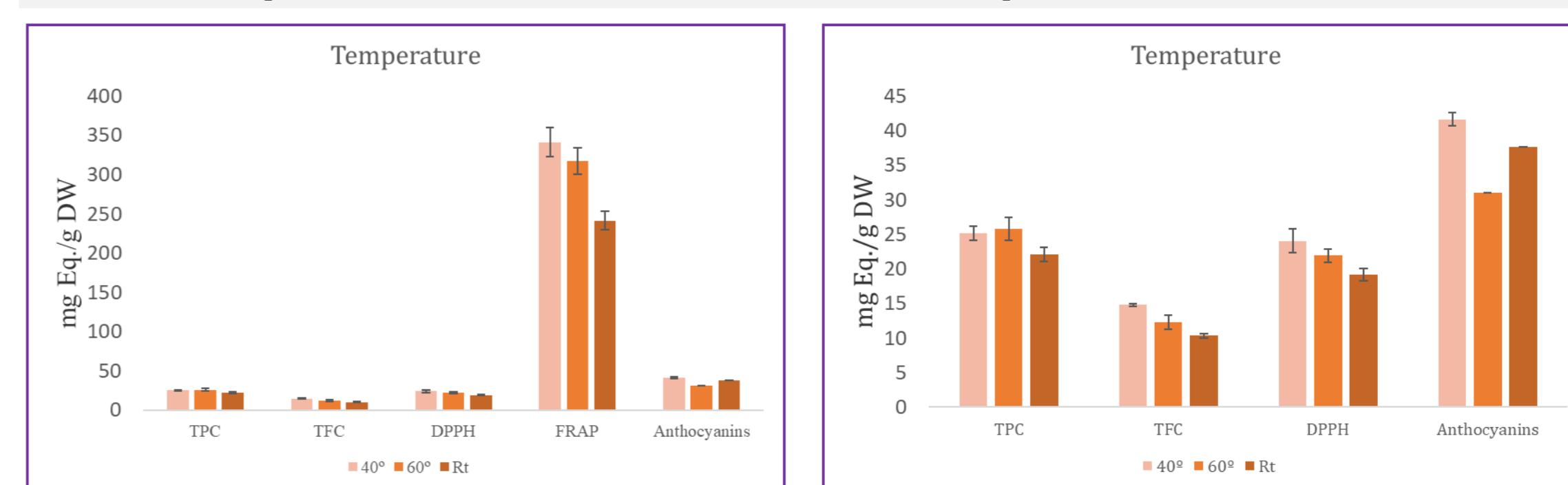
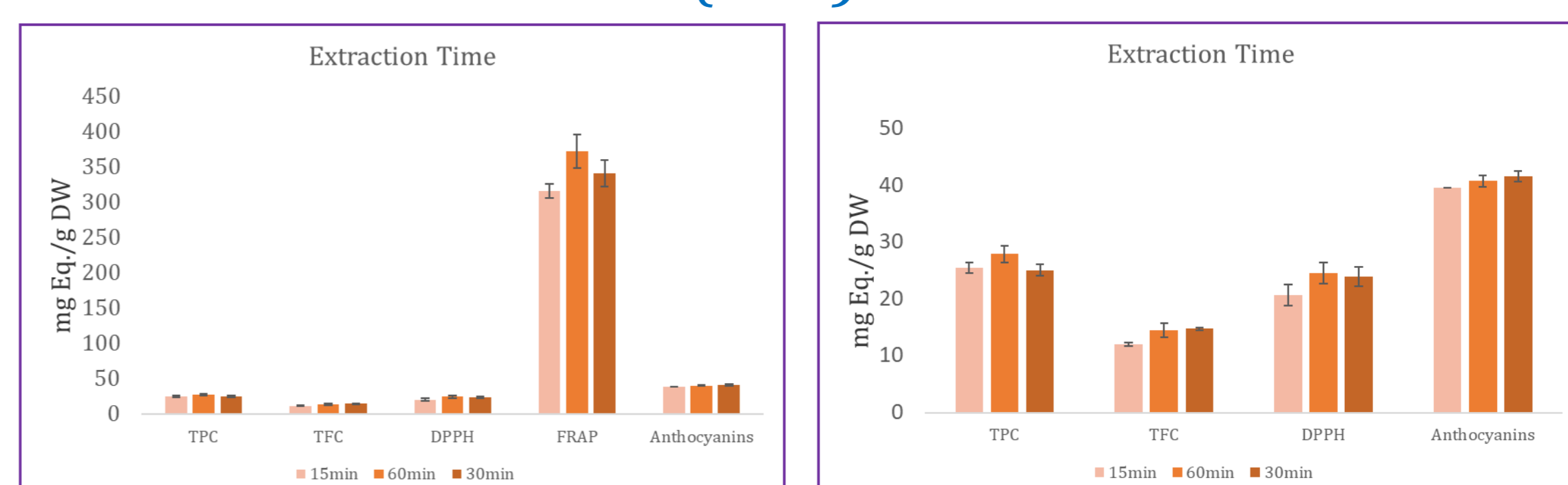
The analyses carried out demonstrate that GP, often regarded as waste with no economic value, represents a strategic resource aligned with current requirements of industrial sustainability. The optimization of extraction methodologies is therefore essential to enhance the recovery of bioactive compounds and promote the effective valorization of this residue, allowing its use not as a mere solution for waste management, but as an opportunity to create new products with high added value.

**References:** 1. Ferrara, A.; Auria, G.D.; Barile, D.; Baller, M.I.; Nitride, C.; Mamone, G.; Ferranti, P. The Valorization of Grape Pomace from Montepulciano Winemaking: A New Source of Functional Ingredients for Sustainable Food Industry. *Food Res. Int.* 2025, 200, 115443, doi:10.1016/j.foodres.2024.115443.

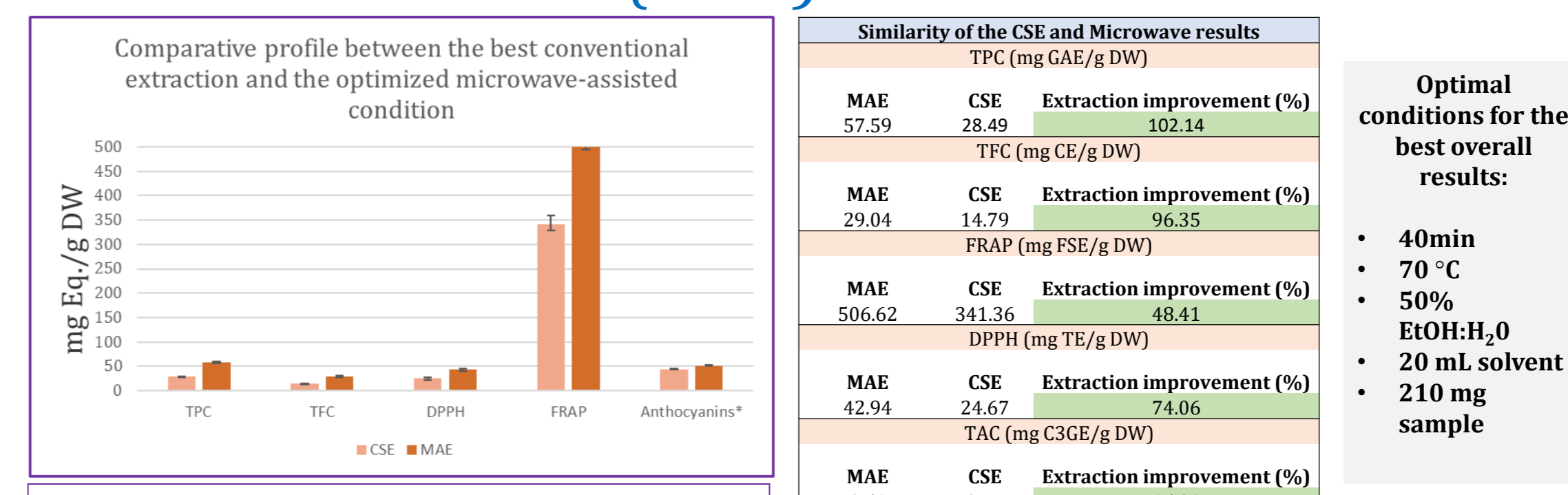
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## Results and discussions

### Conventional Extraction (CSE)



### Microwave Extraction (MAE)



**Optimal conditions for the best overall results:**

- 40min
- 70 °C
- 50%
- EtOH:H<sub>2</sub>O
- 20 mL solvent
- 210 mg sample