



Optimization of Phenolic Compounds from Greek Oregano by Accelerated Solvent Extraction Using Response Surface Methodology

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INTRODUCTION & AIM

Accelerated solvent extraction (ASE) has been considered as a potential alternative to conventional solvent extraction for the isolation of phenolic compounds from plants.



New "green" extraction techniques provide higher efficiency, lower energy, and solvent consumption than conventional extraction processes.

The current lab-scale research focuses on the optimization of accelerated solvent extraction (ASE) for the extraction of phenolics from Greek oregano (*Origanum vulgare* L. ssp. *hirtum*).

RESULTS & DISCUSSION

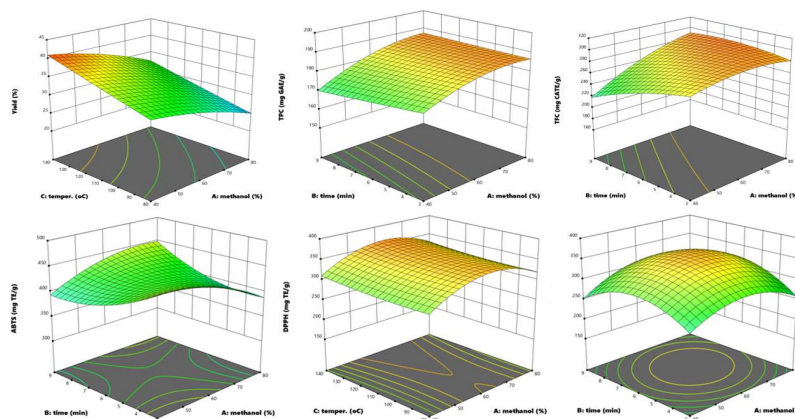


Fig. 1. Response surface plots showing the effects of extraction temperature, methanol concentration and time extraction on extraction yield, TPC, TFC, ABTS and DPPH values. The values of the missing factor were kept at the center point.

METHODOLOGY

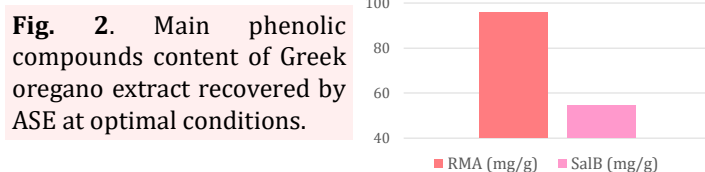
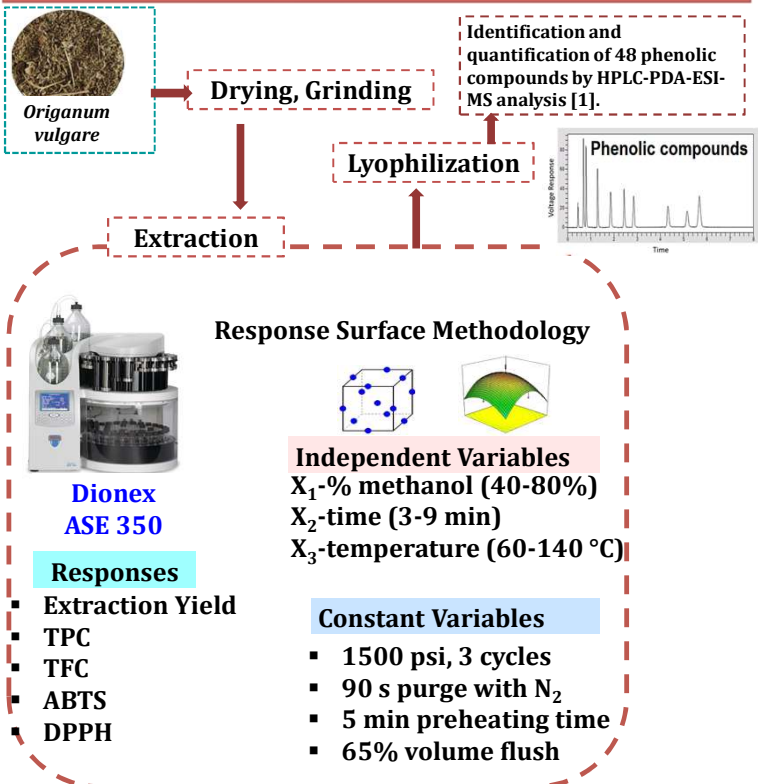


Fig. 2. Main phenolic compounds content of Greek oregano extract recovered by ASE at optimal conditions.

Table 1. Optimal ASE conditions, predicted and experimentally determined values based on the developed model.

	Predicted	Experimental
Yield (%)	33.7	31.1
TPC (mg GAE/g)	184.0	192.6
TFC (mg CATEg)	282.5	309.2
ABTS (mg TE/g)	421.8	399.0
DPPH (mg TE/g)	352.6	331.0
Optimal parameters		
X1	X2	X3
74%	9 min (3 cycles)	140 °C

CONCLUSION

- ✓ ASE is a green alternative for extracting phenolics from Greek oregano with an increased antioxidant activity.
- ✓ Rosmarinic acid (RMA), salvianolic acid B (SALb), and carvacrol (CAR) were the main phenolic components.
- ✓ ASE showed good performance in terms of yields and natural antioxidants recovery from Greek oregano.
- ✓ The optimal ASE extraction conditions could serve as the scientific basis for scaled-up industrial production.

REFERENCES

[1] Irakli, M.; et al. *Antioxidants*, 10, (2021), p. 2016.

ACKNOWLEDGEMENTS

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