



PREDICTION AND VALIDATION OF THE SOLUBILITY OF DATE SEED PHYTOSTEROLS USING HYDROPHOBIC NATURAL DEEP EUTECTIC SOLVENTS

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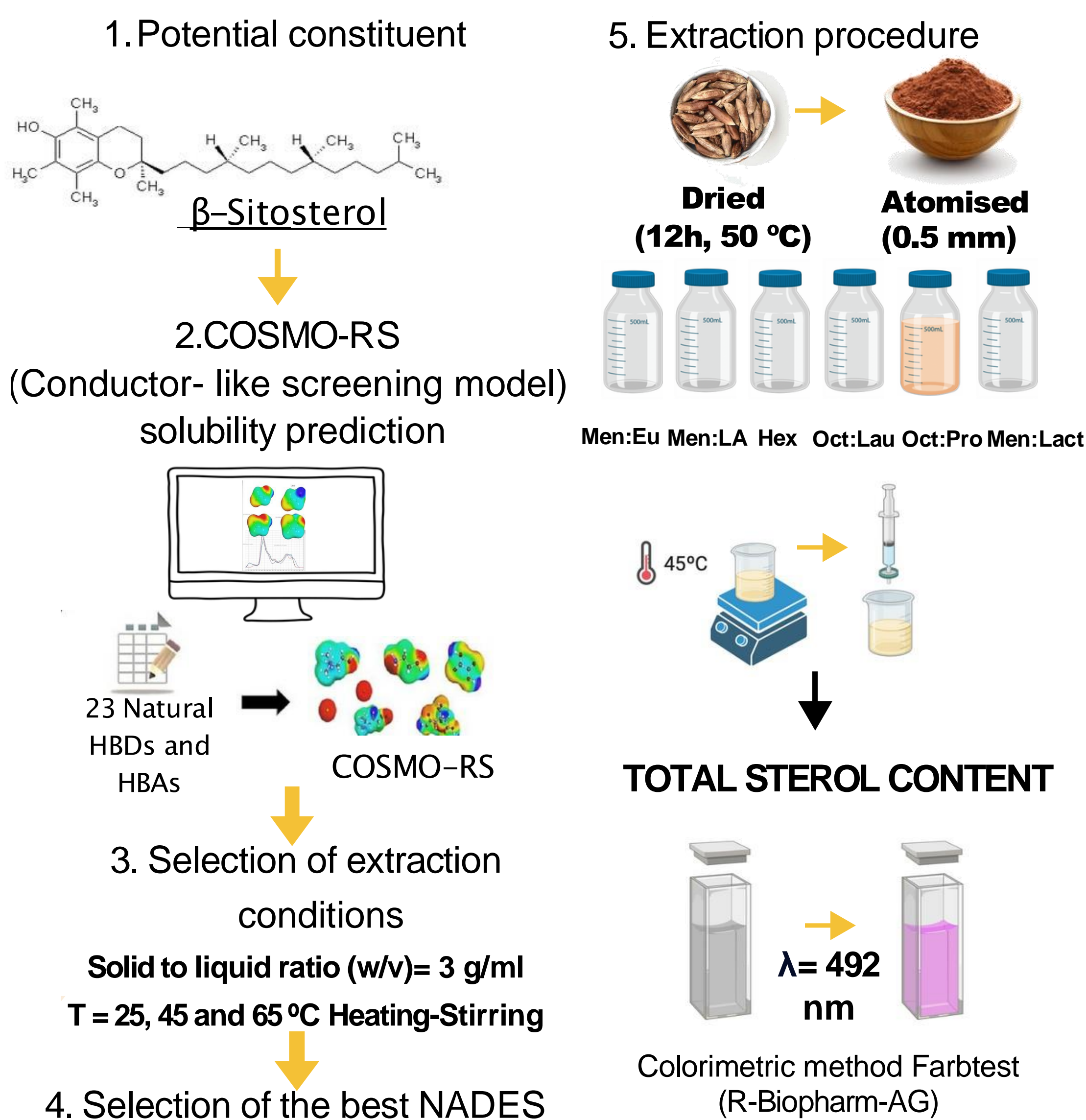
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INTRODUCTION & AIM

Date seeds, a by-product of date fruit production, are rich in bioactive compounds like fatty acids, tocopherols, and phytosterols. Efficient extraction methods, such as Heating-Stirring using Natural Deep Eutectic Solvents (NADES), can save time, thus reducing the environmental and economic impact.

This study aims to assess the solubility of phytosterols in hydrophobic NADES, propose suitable NADES and compare their extraction efficiency against hexane as a control.

METHOD

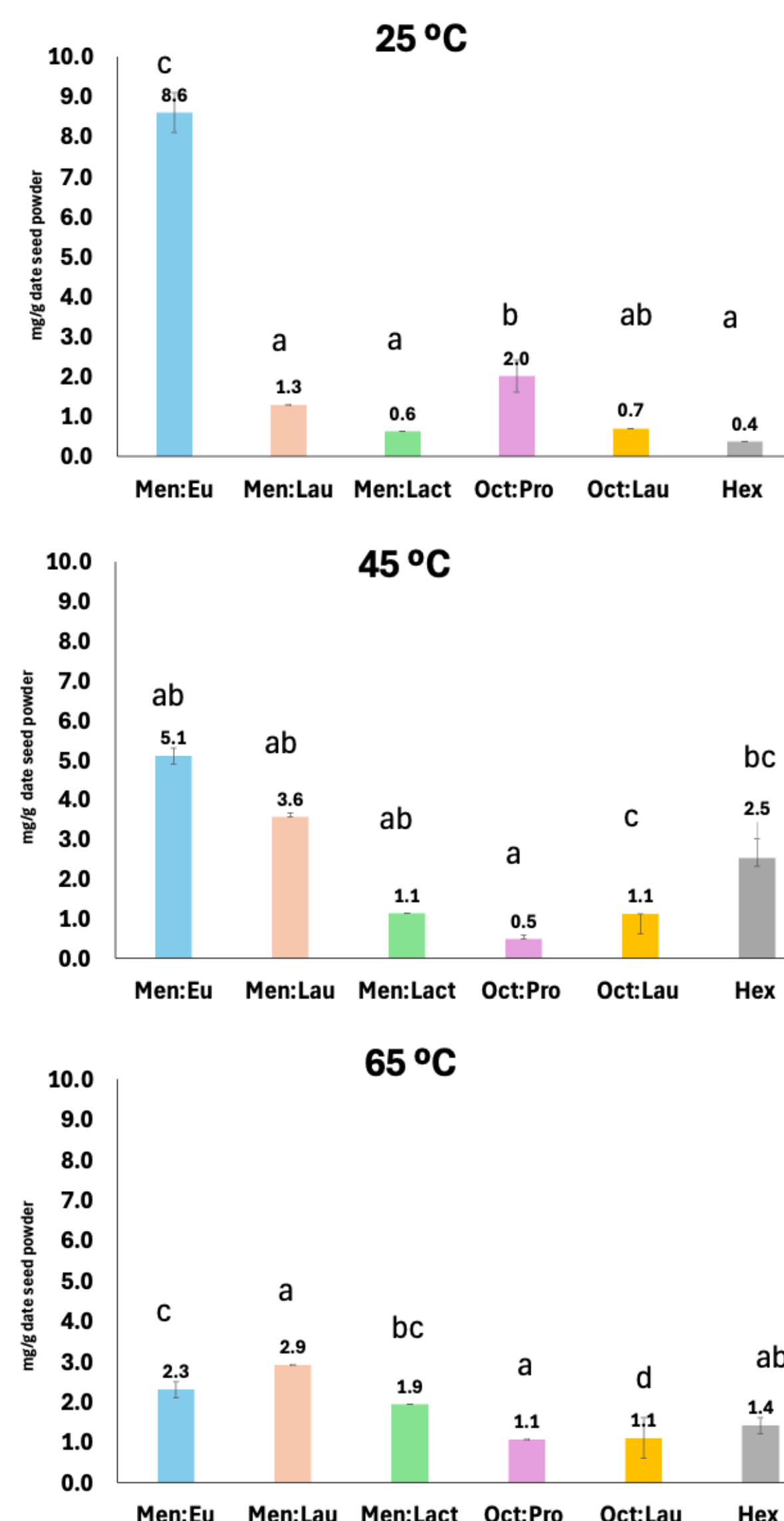


NADES	Abbreviation	Molar ratio	ln(γ) β -Sitosterol		
			25 °C	45 °C	65 °C
Menthol: Eucalyptol	Men:Eu	(1:1)	-1.1	-0.8	-0.8
Menthol: Lauric acid	Men:LA	(2:1)	0.1	0.1	0.1
Hexane	Hex		0.8	0.4	0.2
Octanoic acid: Lauric acid	Oct:LA	(3:1)	0.5	0.5	0.6
Octanoic acid: L-Proline	Oct:Pro	(4:1)	1.0	1.0	1.0
Menthol: Lactic acid	Men:Lact	(1:2)	1.7	1.6	1.6

■ Lower performance than Hexane.
 ■ Equal performance than Hexane.
 ■ Greater performance than Hexane.

ln(γ) β -Sitosterol: activity coefficient of a compound in a liquid solution.

RESULTS



- At 25 °C, Men:Eu extract had 8.6 ± 0.9 mg/g of phytosterols, Oct:Pro extract had 2.0 ± 0.4 mg/g of phytosterols and Hex extract had 0.4 ± 0.0 mg/g of phytosterols.
- Men:Eu extract contained the highest amount of phytosterols compared to the control across all temperature conditions.

CONCLUSION

Hydrophobic NADES demonstrated effective phytosterol extraction from date seeds. COSMO-RS screening facilitated the identification of the most promising NADES formulations, reducing the need for extensive experimental assays to enhance the efficiency of the extraction.

FUNDING

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