Electronic Supporting Information (ESI)

Unveiling the use of hydrophobic eutectic solutions as task-specific solvents to recover bacterioruberin from *Haloferax mediterranei*

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Table S1. Real and coded values of the optimization process expressed by the yield of extraction of bacterioruberin by CCRD (2^3) using Ment+LevA HES.

Run	x_{Ment}	SLR ($g_{wet\ biomass} \cdot mL_{solvent}^{-1}$)	Time (min)	Yield ($mg_{bacterioruberin} \cdot g_{wet\ biomass}^{-1}$)
	X1	X2	X3	Y1
1	-1 (0.54)	-1 (0.07)	-1 (30)	4.30
2	1 (0.66)	-1 (0.07)	-1 (30)	2.04
3	-1 (0.54)	1 (0.23)	-1 (30)	2.42
4	1 (0.66)	1 (0.23)	-1 (30)	1.62
5	-1 (0.54)	-1 (0.07)	1 (90)	4.47
6	1 (0.66)	-1 (0.07)	1 (90)	2.63
7	-1 (0.54)	1 (0.23)	1 (90)	3.35
8	1 (0.66)	1 (0.23)	1 (90)	1.99
9	-1.68 (0.50)	0 (0.15)	0 (60)	4.35
10	1.68 (0.70)	0 (0.15)	0 (60)	1.62
11	0 (0.60)	-1.68 (0.02)	0 (60)	3.28
12	0 (0.60)	1.68 (0.28)	0 (60)	1.63
13	0 (0.60)	0 (0.15)	-1.68 (9.6)	2.23
14	0 (0.60)	0 (0.15)	1.68 (110.4)	3.55
15	0 (0.60)	0 (0.15)	0 (60)	2.87
16	0 (0.60)	0 (0.15)	0 (60)	2.84
17	0 (0.60)	0 (0.15)	0 (60)	2.26
18	0 (0.60)	0 (0.15)	0 (60)	2.75
19	0 (0.60)	0 (0.15)	0 (60)	2.87
20	0 (0.60)	0 (0.15)	0 (60)	2.90

Table S2. Predicted results compared to the experimental values (real) obtained by the fitted model and the respective relative deviation (%) from the independent variables fixed at the optimum conditions of the surface points for the bacterioruberin extraction yield. V1, V2, and V3 represent the validation assays.

Assay	$x_{\mathbf{Ment}}$	**SLR** ($g_{wet\ biomass} \cdot mL_{solvent}^{-1}$)	**Time** (min)	**Yield** ($mg_{bacterioruberin} \cdot g_{wet\ biomass}^{-1}$)		**σ** (%)
				Experimental	**Predicted**	
V1	0.54	0.07	110.4	4.93	4.86	1.31
V2				4.51		-7.86
V3				4.80		-1.29
					Mean of deviation	-2.61

Table S3. Predicted results compared to the experimental values (real) obtained by the fitted model and the respective relative deviation (%) from the independent variables fixed at the optimum conditions chosen for the continuation of the work. P1, P2, and P3 represent the chosen assays.

Assay	$x_{\mathbf{Ment}}$	**SLR** ($g_{wet\ biomass} \cdot mL_{solvent}^{-1}$)	**Time** (min)	**Yield** ($mg_{bacterioruberin} \cdot g_{wet\ biomass}^{-1}$)		**σ** (%)
				Experimental	**Predicted**	
P1	0.50	0.10	110.4	5.36	5.21	2.80
P2				4.92		-6.00
P3				5.21		-0.07
					Mean of deviation	-1.09

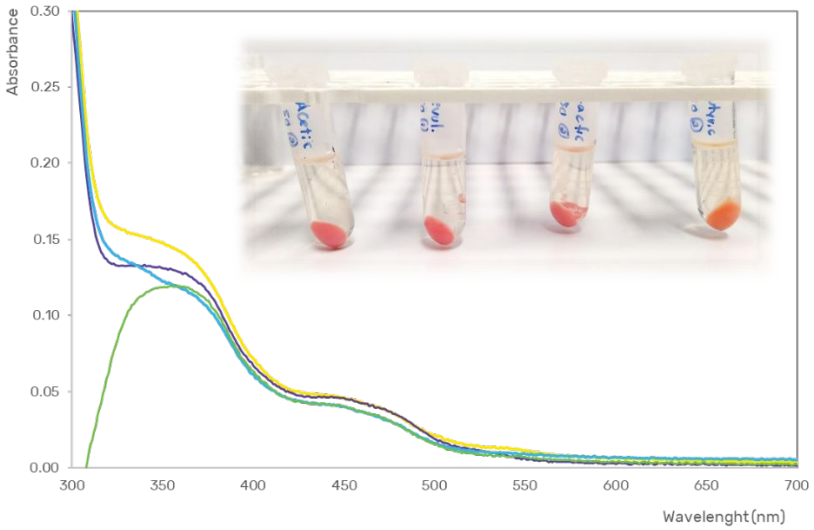

Figure S1. Spectra of the extracts from *H. mediterranei* using 50 vol.% carboxylic acid solutions (AcA, ButA, LA and LevA) in water.

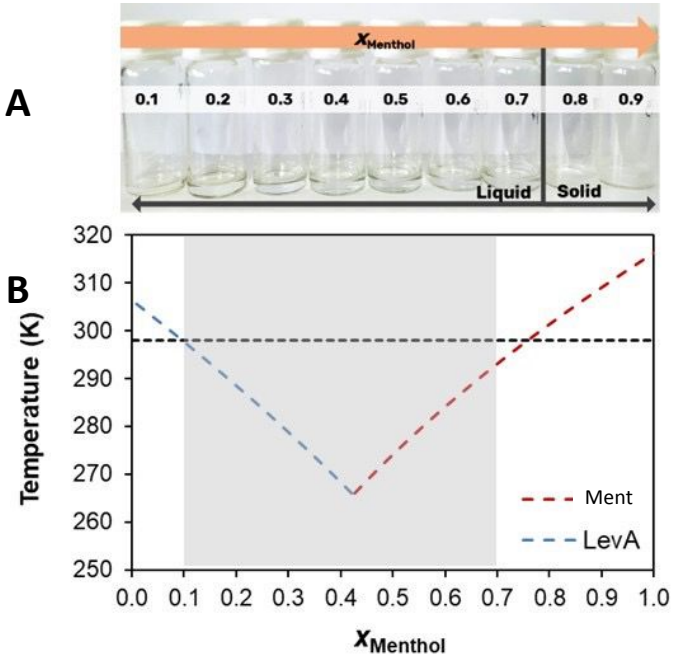

Figure S2. The liquidus range of Ment+LevA HES at room temperature**,** determined by preparing the binary mixture along the full composition range at x_{Ment} (A); and the ideal phase diagram of the Ment+LevA system.

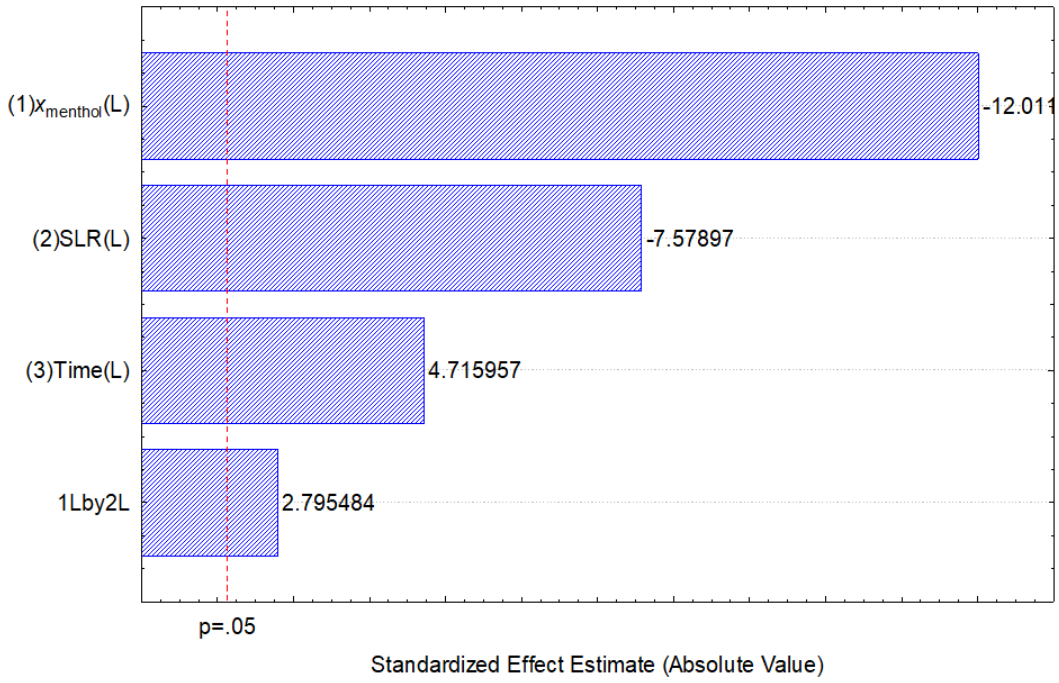

Figure S3. Pareto Chart of the CCRD (2^3) regarding bacterioruberin yield of extraction ($mg_{bacterioruberin} \cdot g_{wet\ biomass}^{-1}$) using Ment+LevA HES.

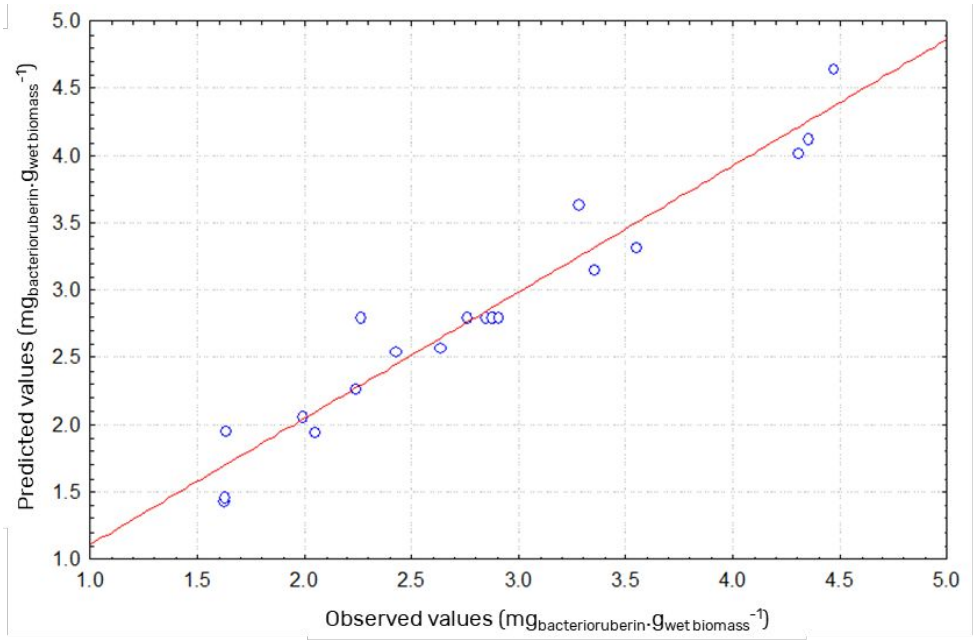

Figure S4. Predicted *vs.* experimental values of the CCRD (2^3) regarding bacterioruberin yield of extraction ($mg_{bacterioruberin} \cdot g_{wet\ biomass}^{-1}$) using Ment+LevA HES.

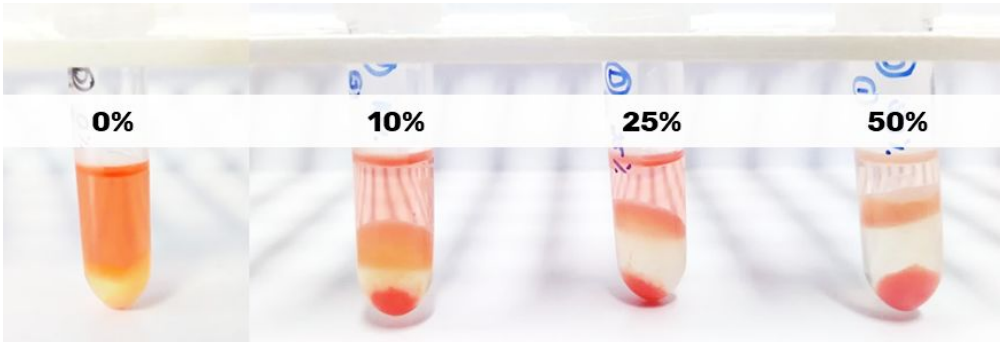

Figure S5. Photograph of the initial screening of the Ment+LevA HES and water systems for the extraction of bacterioruberin, where a white interfacial precipitate is detected.

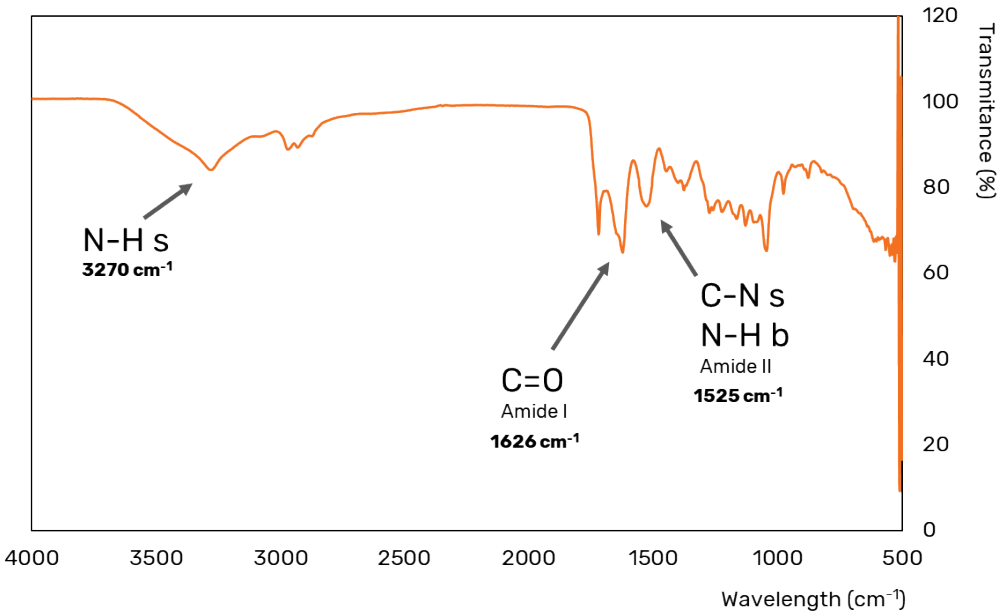

Figure S6. FTIR spectra of the solid interface obtained from the system: Ment+LevA HES and water.

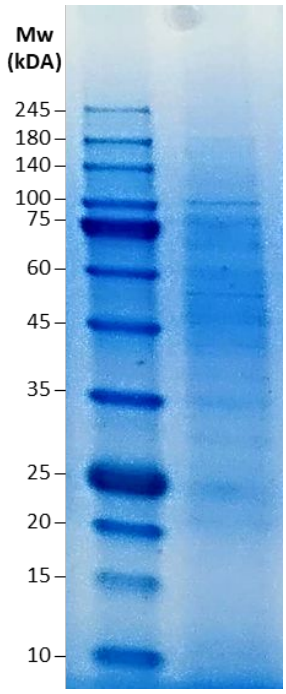

Figure S7. SDS-PAGE of the recovered proteins redissolved in PBS after protein precipitation.

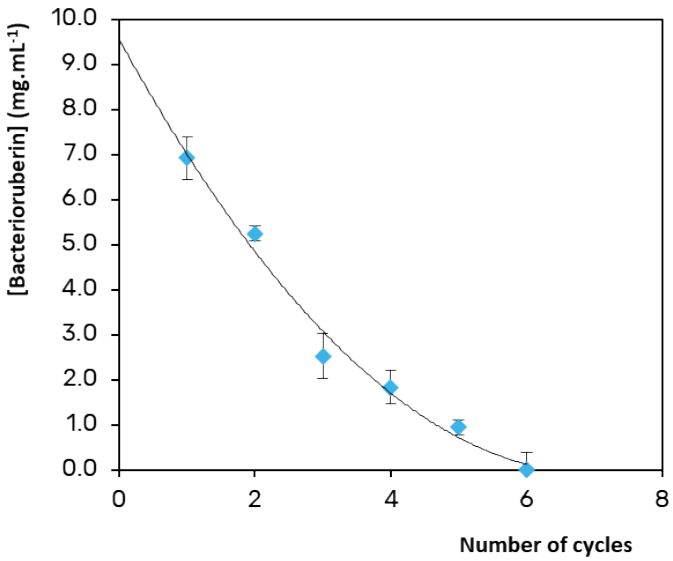

Figure S8. Bacterioruberin yield of extraction obtained from consecutive extractions using Ment:LevA (◆). A higher yield of extraction is found on the first cycle when compared with the optimized value obtained previously due to slight differences in the biomass batch.