*Supplementary materials*

# Use of a Taguchi Design in *Hibiscus sabdariffa* Extracts Encapsulated by Spray-Drying

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**Table S1.** Outlet temperate in treatments of *Hibiscus* extracts (*Hibiscus sabdariffa*) spray-drying with different proportions of MD and GA[1,2].

| Treatment | Inlet temperature (°C) |
|---|---|
| $T_1$ | 65 ± 0.5 |
| $T_2$ | 64 ± 0.5 |
| $T_3$ | 64 ± 0.5 |
| $T_4$ | 93 ± 0.5 |
| $T_5$ | 92 ± 0.5 |
| $T_6$ | 95 ± 0.5 |
| $T_7$ | 64 ± 0.5 |
| $T_8$ | 84 ± 1.5 |

[1] 1 Values are the mean (n = 3). [2] MD: Maltodextrin DE 10, GA: Gum arabic.

**Table S2.** ANOVA general linear model results showing p-values of each factor investigated from the Taguchi L8 design on the selected responses variables.

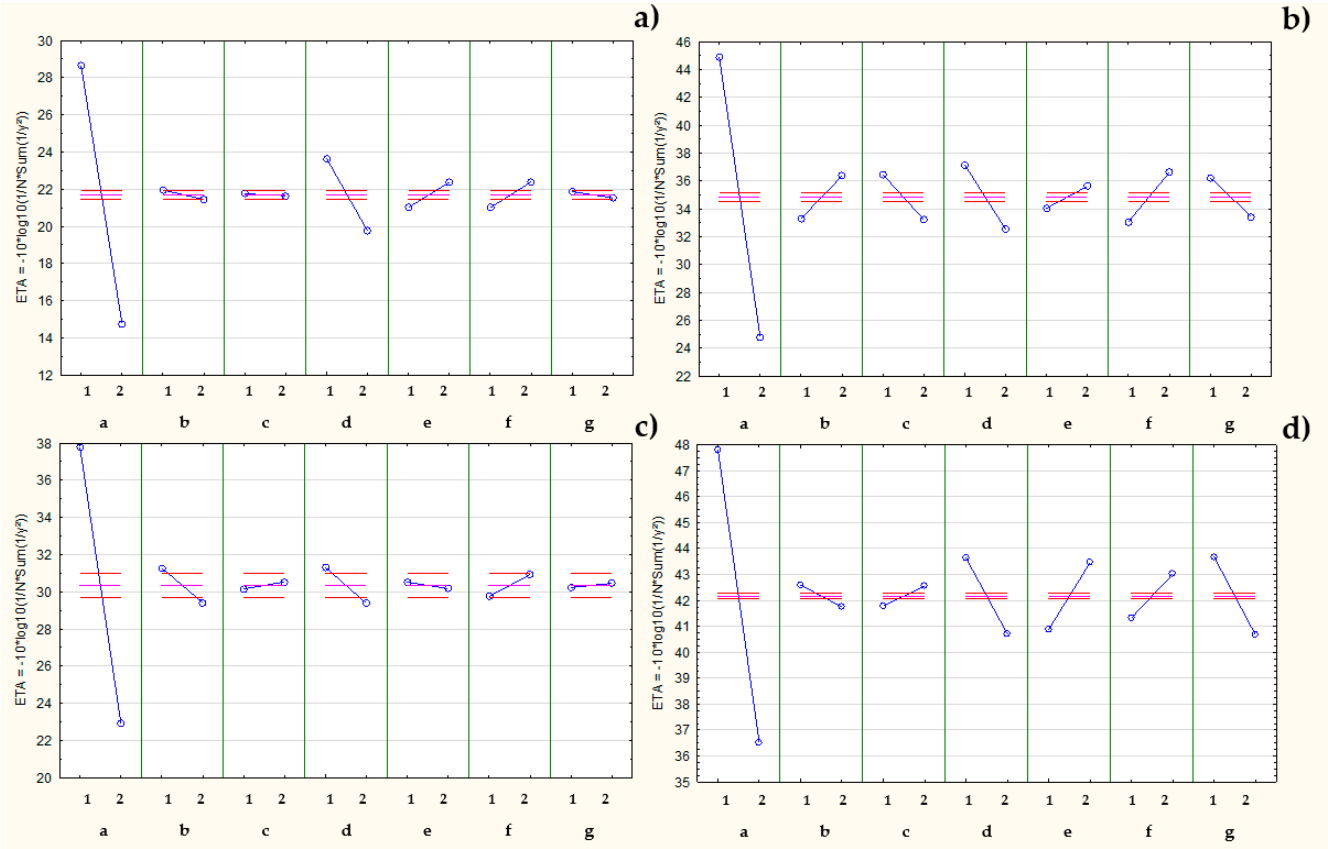
| Variable | SS[1] | Df[2] | MS[3] | F[4] | p |
|---|---|---|---|---|---|
| **FST Content** | | | | | |
| {1} Solvent of extraction | 1155.422 | 1 | 1155.422 | 19320.26 | 0.000000 |
| {4} Extract:carriers ratio (w/w) | 91.270 | 1 | 91.270 | 1526.17 | 0.000000 |
| {6} Homogenization | 11.569 | 1 | 11.569 | 193.45 | 0.000000 |
| {5} Carriers ratio (MD + GA)[5] | 10.970 | 1 | 10.970 | 183.43 | 0.000000 |
| {2} Decoction (°C/min) | 1.511 | 1 | 1.511 | 25.27 | 0.000124 |
| {7} Inlet temperatura (°C) | 0.673 | 1 | 0.673 | 11.26 | 0.004020 |
| {3} *Hibiscus* concentration | 0.061 | 1 | 0.061 | 1.02 | 0.326443 |
| Residual | 0.957 | 16 | 0.060 | | |

**Table S2.** *Cont.*

| | | | | | |
|---|---|---|---|---|---|
| **AOX** | | | | | |
| ABTS | | | | | |
| {1} Solvent of extraction | 2414.040 | 1 | 2414.040 | 26792.05 | 0.000000 |
| {2} Decoction (°C/min) | 56.339 | 1 | 56.339 | 625.28 | 0.000000 |
| {3} *Hibiscus* concentration | 62.708 | 1 | 62.708 | 695.96 | 0.000000 |
| {4} Extract:carriers ratio (w/w) | 128.787 | 1 | 128.787 | 1429.33 | 0.000000 |
| {5} Carriers ratio (MD + GA) | 15.000 | 1 | 15.000 | 166.47 | 0.000000 |
| {6} Homogenization | 76.048 | 1 | 76.048 | 844.01 | 0.000000 |
| {7} Inlet temperatura (°C) | 46.757 | 1 | 46.757 | 518.93 | 0.000000 |
| Residual | 1.442 | 16 | 0.090 | | |
| DPPH | | | | | |
| {1} Solvent of extraction | 1322.908 | 1 | 1322.908 | 3359.843 | 0.000000 |
| {4} Extract:carriers ratio (w/w) | 22.469 | 1 | 22.469 | 57.065 | 0.000001 |
| {2} Decoction (°C/min) | 20.698 | 1 | 20.698 | 52.568 | 0.000002 |
| {6} Homogenization | 8.170 | 1 | 8.170 | 20.749 | 0.000324 |
| {3} *Hibiscus* concentration | 0.833 | 1 | 0.833 | 2.116 | 0.165080 |
| {5} Carriers ratio (MD + GA) | 0.738 | 1 | 0.738 | 1.874 | 0.189882 |
| {7} Inlet temperatura (°C) | 0.306 | 1 | 0.306 | 0.776 | 0.391414 |
| Residual | 6.300 | 16 | 0.394 | | |
| FRAP | | | | | |
| {1} Solvent of extraction | 763.3372 | 1 | 763.3372 | 70317.90 | 0.000000 |
| {2} Decoction (°C/min) | 4.3148 | 1 | 4.3148 | 397.48 | 0.000000 |
| {3} *Hibiscus* concentration | 3.4680 | 1 | 3.4680 | 319.47 | 0.000000 |
| {4} Extract:carriers ratio (w/w) | 51.4172 | 1 | 51.4172 | 4736.51 | 0.000000 |
| {5} Carriers ratio (MD + GA) | 39.7565 | 1 | 39.7565 | 3662.34 | 0.000000 |
| {6} Homogenization | 17.2442 | 1 | 17.2442 | 1588.52 | 0.000000 |
| {7} Inlet temperatura (°C) | 54.2813 | 1 | 54.2813 | 5000.35 | 0.000000 |
| Residual | 0.1737 | 16 | 0.0109 | | |

[1] SS. Sum of Squares
[2] df. Degree of Freedom
[3] MS. Mean Square
[4] F. F- Value
[5] MD: Maltodextrin DE 10, GA: Gum arabic.

**Figure S1.** Taguchi analysis for main effects: a) FST Content, AOX b) ABTS, c) DPPH and d) FRAP, ordinate values are the averaged one for each factor and abscissa shows the difference between highest and lowest response obtained for each independent factor




Abscissa values:

| Level | Solvent of extraction (a) | Decoction (ºC/min) (b) | *Hibiscus* concentration (%) (c) | Extract:carriers ratio (w/w) (d) | Carriers ratio (MD + GA)[1] (%) (e) | Homogenization (rpm) (f) | Inlet temperature (°C) (g) |
|---|---|---|---|---|---|---|---|
| **1** | Water | NA[2] | 1 | 1:1 | 80:20 | 5,000 | 110 |
| **2** | Ethanol 20% | 100 / 5 | 2.5 | 1:2 | 90:10 | 10,000 | 150 |

1. MD: Maltodextrin DE 10, GA: Gum arabic
2. NA