Pretreated Agro-Industrial Effluents as a Source of Nutrients for Tomato Grow in Dual Function Hydroponic System: Tomato Quality Assessment

Alexandra Afonso [1,2,*], Carlos Ribeiro [1], Maria João Carvalho [1,3], Tânia Correia [1], Pedro Correia [1], Mariana Regato [4], Idália Costa [4], Annabel Fernandes [2,5], Adelaide Almeida [1,2], Ana Lopes [2,5] and Fátima Carvalho [1,2]

[1] Department of Applied Sciences and Technologies, Escola Superior Agrária de Beja, Instituto Politécnico de Beja, 7800-309 Beja, Portugal; carlos.ribeiro@ipbeja.pt (C.R.); joaobcarvalho@ipbeja.pt (M.J.C.); taires.correia@gmail.com (T.C.); pedro_correia92@hotmail.com (P.C.); maalmeida@ipbeja.pt (A.A.); mfcarvalho@ipbeja.pt (F.C.)

[2] Fiber Materials and Environmental Technologies (FibEnTech-UBI), Universidade da Beira Interior, R. Marquês D'Ávila e Bolama, 6201-001 Covilhã, Portugal; annabelf@ubi.pt (A.F.); analopes@ubi.pt (A.L.)

[3] MARE–Marine and Environmental Sciences Centre, CETEMARES–Marine Sciences R&D, Education and Knowledge Dissemination Centre, Polytechnic Institute of Leiria, Av. Porto de Pesca, 2520-630 Peniche, Portugal

[4] Department of Bioscience, Escola Superior Agrária de Beja, Instituto Politécnico de Beja, 7800-295 Beja, Portugal; mare@ipbeja.pt (M.R.); idalia.costa@ipbeja.pt (I.C.)

[5] Department of Chemistry, Universidade da Beira Interior, R. Marquês D'Ávila e Bolama, 6201-001 Covilhã, Portugal

* Correspondence: alexandra.afonso@ipbeja.pt

Supplementary Material

Table S1. Nutritive solution supplementation throughout the development phase of the tomato plants.

Reagent	Stage of growth		
	Transplant to 2nd cluster	2nd cluster to 5th cluster	5th cluster to termination
TRADECORP AZ / mg L^{-1}	23	23	23
KNO_3 / mg L^{-1}	157	235	364
$MgSO_4$ / mg L^{-1}	456	504	504
KH_2PO_4 / mg L^{-1}	220	220	220
$Ca(NO_3)_2$ / mg L^{-1}	415	415	415

Table S2. Characterization of the plants and fruit grown in the different hydroponic systems fed with nutritive solution from pretreated CWW (mean value ± standard deviation, n⩾10).

	Parameter	Setup A			Setup B		
		A1	A2	A3	B1	B2	B3
Plant	Height / cm	121±19^{b}	126±18^{b}	145±14^{a}	102±20^{b}	95±20^{b}	151±35^{a}
	Stem diameter / mm	11±2^{b}	13±2^{a}	10.0±0.6^{b}	10±2^{a}	10±1^{a}	10.5±0.8^{a}
	Number of leaves	9±2^{b}	8±2^{b}	16±3^{a}	21±3^{b}	21±3^{b}	38±4^{a}
	Number of bunches	4±1^{b}	5±1^{b}	6±1^{a}	5±2^{b}	5±1^{b}	14±8^{a}
	Total fruit	26±13^{a,b}	34±11^{a}	15±9^{b}	12±7^{b}	13±6^{b}	128±69^{a}
	Marketable fruit	19±10^{a}	23±9^{a}	5±4^{b}	6±3^{b}	8±4^{b}	74±56^{a}
Fruit	Diameter / mm	25±3^{a}	27±2^{a}	26±2^{a}	16±2^{a}	18±3^{a}	18±1^{a}
	Marketable diameter / mm	27±4 ^{a}	28±2 ^{a}	27±3^{a}	21±4^{a}	22±2^{a}	19±1^{a}
	Weight / g	11±3^{a}	13±3^{a}	11±2^{a}	4±2^{a}	5±1^{a}	4.1±0.4^{a}
	Marketable weight / g	12±4^{a}	14±3^{a}	12±3^{a}	7±3^{a}	6±2^{a}	4±1^{a}
Total marketable weight (g)/plant		228±163^{b}	337±141^{a}	62±51^{c}	37±24^{b}	62±38^{b}	315±221^{a}

a,b,c Different letters in different lines means statistically significant differences ($P<0.05$).

Table S3. Sensory characteristics of the cherry tomatoes (*Solanum lycopersicum* var. *cerasiforme*) produced in the different hydroponic systems, evaluated in two different sessions. 5=extremely pleasant; 4=pleasant; 3=indifferent; 2=unpleasant; 1=extremely unpleasant (mean value ± standard deviation, n≥30).

Parameter	Session 1		Session 2			
	A1	A2	A3	B1	B2	B3
Red color	3.7±0.8[b]	4.3± 0.8[a]	4.5 ± 0.7[a]	4.0 ± 0.8[a,c]	3.9 ± 0.8[b,c]	3.8±0.9[c]
Smell	3.7± 0.8[b]	4.1± 0.8[a]	4.1 ± 0.7[a]	4.2 ± 0.5[a]	3.8 ± 0.8[a]	3.5±0.9[b,c]
Flavor	4.0± 0.7[b]	4.5± 0.8[a]	3.2 ± 0.9[b,c]	4.2 ± 0.9[a]	4.0 ± 0.8[a]	3.3±0.9[b,c]
Juiciness	3.9± 0.8[a]	4.1± 0.8[a]	3.7 ± 0.8[a]	3.9 ± 0.9[a]	4.1 ± 0.7[a]	3.6±0.9[a]
Texture	4.1±0.5[a]	4.1± 0.9[a]	3.4 ± 0.9[b,c]	3.9 ± 0.8[a,c]	4.0 ± 0.7[a]	3.5±0.9[a]
Overall appreciation	4.3± 0.7[a]	4.2±0.8[a]	3.8 ± 0.8[a]	4.0 ± 0.6[a]	3.9 ± 0.7[a,c]	3.4±0.9[b,c]

a,b,c Different letters in different lines means statistically significant differences ($P<0.05$).