

Supplementary Material

Use of chemometrics for correlating carobs nutritional compositional values with geographic origin

Rebecca Kokkinofta ^{1,*}, Stelios Yiannopoulos ¹, Marinos A. Stylianou ², Agapios Agapiou ^{2,*}

¹ State General Laboratory, P.O.Box 28648, Nicosia, Cyprus

² University of Cyprus, Department of Chemistry, P.O. Box 20537, 1678, Nicosia, Cyprus

* Correspondence: sglsnif@cytanet.com.cy (R.K.); agapiou.agapios@ucy.ac.cy (A.A.)

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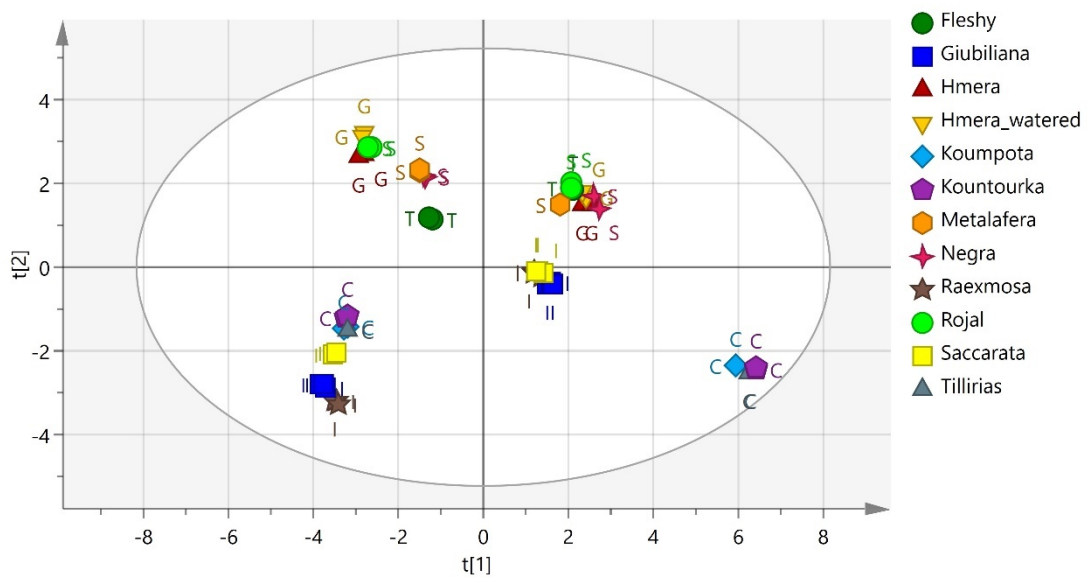


Figure S1: PCA scatter plot of 54 carob samples, according to their variety (C: Cyprus, G: Greece, I: Italy, S: Spain, T: Turkey).

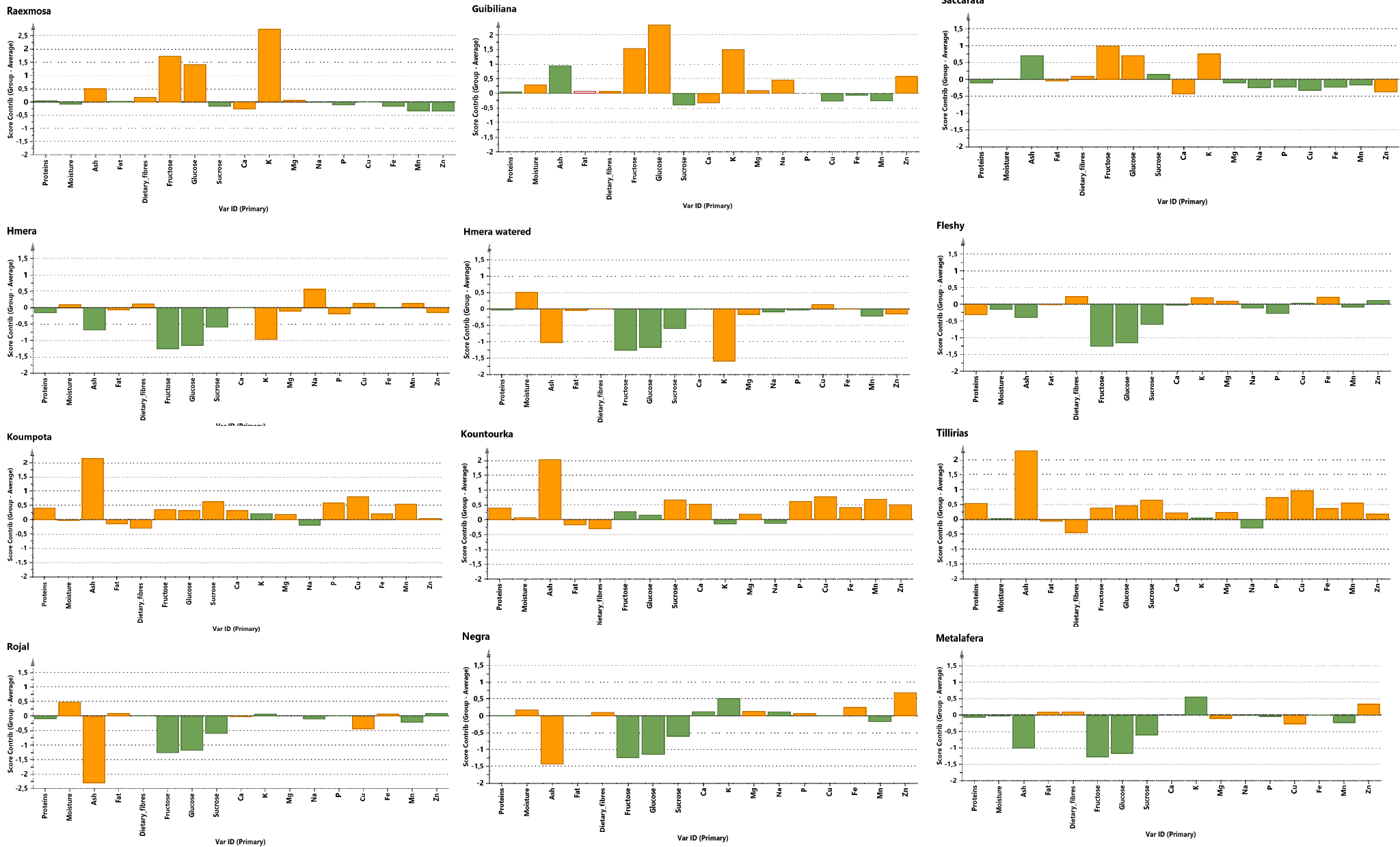


Figure S2: Contribution plots of the 12 varieties based on the PCA model (Fig. S1).

Table S1: Results obtained from the analysis of carobs (flesh and seeds).

			Proteins	Moisture	Ash	Fat	Dietary fibres	Fructose	Glucose	Sucrose	Ca	K	Mg	Na	P	Cu	Fe	Mn	Zn
Country	Type	Variety	(% w/w)								Mineral content (mg/100 g)								
Palestine	Seed	Unknown	13.73	9.90	3.12	1.92	64.12	0.00	0.00	1.02	364.00	868.00	119.00	<1	230.00	0.53	3.03	2.66	2.14
Palestine	Seed	Unknown	13.39	10.09	3.06	1.90	63.01	0.00	0.00	0.65	385.00	900.00	126.00	<1	240.00	0.52	3.01	2.69	2.74
Palestine	Seed	Unknown	13.54	9.89	3.00	1.84	62.53	0.00	0.00	0.86	375.00	887.00	123.00	<1	238.00	0.52	3.12	2.73	2.64
Palestine	Flesh	Unknown	3.70	11.46	2.75	0.22	21.34	10.27	4.15	40.18	451.00	741.00	83.60	6.12	57.50	0.20	0.85	0.39	0.55
Palestine	Flesh	Unknown	3.33	11.20	2.67	0.21	21.92	10.51	4.07	41.91	467.00	740.00	78.70	3.32	56.90	0.18	0.83	0.40	0.54
Palestine	Flesh	Unknown	3.36	11.23	2.71	0.18	21.24	9.91	4.15	41.84	453.00	734.00	78.10	3.22	56.10	0.18	0.78	0.39	0.56
Jordan	Seed	Unknown	16.78	9.58	3.22	2.25	63.46	0.00	0.00	2.04	411.00	883.00	129.00	<1	228.00	0.51	2.79	2.58	2.31
Jordan	Seed	Unknown	17.10	9.43	2.95	2.29	62.47	0.00	0.00	0.00	455.00	910.00	136.00	<1	242.00	0.53	2.93	2.69	2.26
Jordan	Seed	Unknown	16.75	9.84	3.00	2.26	62.32	0.00	0.00	0.00	380.00	859.00	124.00	<1	228.00	0.51	2.71	2.42	2.10
Jordan	Flesh	Unknown	3.53	10.40	2.75	0.25	24.91	10.76	4.60	38.89	443.00	773.00	80.90	3.36	58.30	0.19	0.99	0.42	0.74
Jordan	Flesh	Unknown	3.22	10.54	2.68	0.28	24.76	10.76	4.27	39.98	447.00	795.00	83.80	4.65	59.10	0.20	1.02	0.43	0.76
Jordan	Flesh	Unknown	3.15	10.30	2.61	0.24	24.35	10.44	4.50	40.57	419.00	786.00	80.30	3.63	56.20	0.19	0.94	0.42	0.70
Italy	Seed	Unknown	10.96	9.95	2.84	1.69	68.35	0.00	0.00	0.00	417.00	785.00	119.00	1.81	207.00	0.65	2.91	2.36	1.75
Italy	Seed	Unknown	10.76	9.90	2.96	1.63	69.68	0.00	0.00	0.00	408.00	768.00	118.00	2.81	207.00	0.65	3.05	2.40	1.85
Italy	Seed	Unknown	11.13	9.86	3.09	1.69	68.96	0.00	0.00	0.00	439.00	818.00	129.00	1.40	216.00	0.67	3.27	2.53	1.95
Italy	Flesh	Unknown	5.51	9.15	2.76	0.43	28.83	6.42	1.60	39.04	304.00	815.00	50.70	3.63	61.00	0.30	1.30	0.57	0.56
Italy	Flesh	Unknown	5.33	9.35	2.62	0.37	28.65	6.40	1.78	39.43	328.00	808.00	56.70	3.79	59.70	0.30	1.32	0.62	0.60
Italy	Flesh	Unknown	5.43	9.06	2.52	0.35	29.15	5.71	1.67	39.79	334.00	815.00	56.50	3.90	61.60	0.29	1.31	0.60	0.58
Italy	Seed	Raexmosa	14.89	10.69	2.76	1.78	65.13	0.00	0.00	1.53	342.00	878.00	150.00	<1	214.00	0.55	2.93	1.27	1.68
Italy	Seed	Raexmosa	16.21	10.74	2.77	1.67	67.49	0.00	0.00	1.36	377.00	917.00	158.00	<1	228.00	0.57	2.87	1.29	1.74
Italy	Seed	Raexmosa	15.52	10.64	2.87	1.70	64.32	0.00	0.00	1.48	370.00	823.00	145.00	<1	201.00	0.53	2.63	1.23	1.70
Italy	Flesh	Raexmosa	5.91	11.46	3.54	0.58	35.03	17.47	6.76	13.14	121.00	1479.00	67.10	4.54	97.80	0.40	1.43	0.35	0.83
Italy	Flesh	Raexmosa	5.82	11.37	3.59	0.47	35.62	17.73	7.14	13.24	123.00	1440.00	65.40	4.34	97.70	0.40	1.32	0.36	0.81

Italy	Flesh	Raexmosa	5.37	11.47	3.89	0.56	35.08	17.91	6.99	13.07	125.00	1441.00	65.10	3.99	96.40	0.39	1.32	0.36	0.96
Italy	Seed	Giubiliana	15.26	11.07	3.14	1.88	66.43	0.00	0.00	1.08	303.00	938.00	166.00	<1	264.00	0.53	3.29	1.50	1.80
Italy	Seed	Giubiliana	16.23	11.10	3.18	1.79	64.26	0.00	0.00	0.00	291.00	898.00	159.00	<1	257.00	0.53	3.88	1.47	2.18
Italy	Seed	Giubiliana	16.31	11.17	3.05	1.90	63.90	0.00	0.00	0.00	313.00	943.00	165.00	<1	261.00	0.55	3.49	1.59	1.97
Italy	Flesh	Giubiliana	5.62	14.50	3.66	0.55	30.59	16.91	9.46	6.67	120.00	1202.00	63.50	8.33	85.30	0.24	1.38	0.38	4.22
Italy	Flesh	Giubiliana	5.40	14.52	3.63	0.47	29.85	16.12	9.51	6.96	113.00	1176.00	58.20	8.75	86.90	0.24	1.30	0.38	4.12
Italy	Flesh	Giubiliana	5.43	14.34	3.65	0.58	30.48	16.52	9.33	6.61	118.00	1168.00	57.20	8.96	85.80	0.24	1.35	0.39	4.31
Italy	Seed	Saccarata	14.16	10.58	3.11	1.75	65.03	0.00	0.00	1.66	313.00	855.00	127.00	<1	221.00	0.53	3.00	1.92	1.97
Italy	Seed	Saccarata	14.33	10.67	3.06	1.79	63.84	0.00	0.00	0.93	341.00	878.00	135.00	<1	225.00	0.53	3.27	2.00	1.87
Italy	Seed	Saccarata	14.63	10.53	3.04	1.70	65.50	0.00	0.00	1.35	310.00	850.00	127.00	<1	216.00	0.54	2.84	1.89	1.84
Italy	Flesh	Saccarata	4.45	12.43	3.55	0.28	30.23	13.67	5.14	23.06	165.00	1135.00	59.80	3.19	63.80	0.23	1.35	0.42	0.62
Italy	Flesh	Saccarata	4.25	12.29	3.58	0.30	32.33	13.37	5.23	23.29	159.00	1122.00	61.10	2.61	63.50	0.24	1.17	0.39	0.72
Italy	Flesh	Saccarata	4.28	12.47	3.55	0.31	31.06	13.63	5.11	23.54	169.00	1119.00	61.90	2.33	63.50	0.24	1.15	0.42	0.67
Greece	Seed	Hmera	12.82	8.80	3.14	1.61	69.08	0.00	0.00	0.00	408	923	116.9	2.60	233	0.79	4.22	2.75	2.73
Greece	Seed	Hmera	13.03	8.96	3.22	1.64	68.15	0.00	0.00	0.00	403	901	144.66	1.60	229.1	0.75	4.08	2.83	2.69
Greece	Flesh	Hmera	3.70	14.85	2.45	0.26	29.56	0.138	0.187	0.746	264	774	45.87	8.80	46.2	0.27	1.36	0.57	0.55
Greece	Flesh	Hmera	3.65	15.13	2.56	0.28	28.96	0.131	0.201	0.747	256	763	45.55	10.10	45.5	0.29	1.29	0.56	0.55
Greece	Seed	Hmera_watered	14.71	9.03	3.23	1.64	67.77	0.00	0.00	0.00	460	884	115.07	1.80	253	0.81	4.71	1.58	2.60
Greece	Seed	Hmera_watered	15.52	8.94	3.07	1.83	65.37	0.00	0.00	0.00	446	857	111.6	1.50	245.6	0.81	3.97	1.55	2.54
Greece	Flesh	Hmera_watered	4.29	19.18	2.32	0.17	23.73	0.12	0.156	0.618	296	679	48.82	2.20	69.9	0.24	0.81	0.26	0.64
Greece	Flesh	Hmera_watered	4.11	19.16	2.31	0.26	25.22	0.107	0.158	0.621	264	732	42.91	3.50	93.8	0.26	0.92	0.33	0.71
Greece	Seed	Unknown	19.39	7.49	3.7	1.86	65.96	0.00	0.00	0.00	425	959	120.19	2.40	290.3	0.71	3.99	2.65	2.29
Greece	Seed	Unknown	17.07	7.76	3.69	1.75	65.71	0.00	0.00	0.00	423	947	116.51	1.10	280	0.70	3.99	2.64	2.27
Greece	Flesh	Unknown	4.36	12.49	2.28	0.39	27.48	0.072	0.147	0.746	251	743	42.44	3.30	84.1	0.25	1.04	0.45	0.65
Greece	Flesh	Unknown	4.16	12.52	2.26	0.47	27.70	0.07	0.148	0.76	267	697	48.57	2.20	70.7	0.28	1.20	0.46	0.77
Turkey	Seed	Fleshy	12.08	10.14	2.51	1.95	67.48	0.00	0.00	0.00	332.00	757.00	155.00	1.57	193.00	0.72	4.75	1.94	1.57
Turkey	Seed	Fleshy	10.83	10.01	2.58	1.85	68.14	0.00	0.00	0.00	348.00	752.00	159.00	1.39	192.00	0.68	4.77	1.96	1.39

Turkey	Flesh	Fleshy	2.29	11.22	3.4	0.15	38.73	0.064	0.16	0.62	321	1138	65.4	2.80	59.5	0.29	2.34	0.52	2.80
Turkey	Flesh	Fleshy	2.37	11.30	3.25	0.2	32.87	0.064	0.16	0.62	328	1114	65.2	2.97	59.1	0.27	2.37	0.53	2.97
Cyprus	Flesh	Koumpota	4.59	14.44	2.65	0.22	26.24	9.51	3.89	39.94	215	921	50	2.50	65	0.26	0.65	0.38	0.68
Cyprus	Flesh	Koumpota	4.55	14.50	2.59	0.21	-	9.67	4.29	39.88	215	921	50	2.50	65	0.26	0.65	0.38	0.68
Cyprus	Flesh	Kountourka	4.58	14.81	2.46	0.2	25.56	9.35	3.86	41.51	295	870	44	3.20	57	0.20	0.63	0.44	0.74
Cyprus	Flesh	Kountourka	4.51	14.85	2.51	0.22	-	8.92	3.44	40.96	295	870	44	3.20	57	0.20	0.63	0.44	0.74
Cyprus	Flesh	Tillirias	4.57	13.65	2.45	0.23	24.28	9.8	4.43	40.55	204	919	47	1.80	60	0.28	0.66	0.36	0.79
Cyprus	Flesh	Tillirias	4.63	13.59	2.46	0.23	23.77	9.73	4.47	40.67	204	919	47	1.80	60	0.28	0.66	0.36	0.79
Cyprus	Seed	Tillirias	25.04	9.46	5.25	1.77	46.33	0.00	0.00	0.00	641.1	935.4	194.5	<LOD (<1.3)	507.9	1.28	6.91	4.18	3.78
Cyprus	Seed	Tillirias	24.76	9.46	5.25	1.77	45.35	0.00	0.00	0.00	641.1	935.4	194.5	<LOD (<1.3)	507.9	1.28	6.91	4.18	3.78
Cyprus	Seed	Koumpota	23.16	8.08	4.97	1.55	50.39	0.00	0.00	0.00	708.4	961.4	185.2	<LOD (<1.3)	462.6	1.21	6.03	4.22	3.42
Cyprus	Seed	Koumpota	22.87	8.08	4.97	1.55	50.05	0.00	0.00	0.00	708.4	961.4	185.2	<LOD (<1.3)	462.6	1.21	6.03	4.22	3.42
Cyprus	Seed	Kountourka	22.48	8.69	5.05	1.53	51.43	0.00	0.00	0.00	713.3	949.9	189	<LOD (<1.3)	471.4	1.24	7.08	4.50	5.05
Cyprus	Seed	Kountourka	22.20	8.69	5.05	1.53	51.34	0.00	0.00	0.00	713.3	949.9	189	<LOD (<1.3)	471.4	1.24	7.08	4.50	5.05
Spain	Seed	Rojal	14.79	11.06	2.47	2.16	61.41	0.00	0.00	0.00	369.00	937.00	167.00	2.02	284.00	0.50	5.02	1.56	2.02
Spain	Seed	Rojal	13.40	11.66	2.84	2.16	62.80	0.00	0.00	0.00	375.00	953.00	169.00	1.77	286.00	0.50	5.16	1.59	1.77
Spain	Flesh	Rojal	3.79	16.35	1.89	0.4	29.67	0.067	0.144	0.609	210	920	37.27	2.62	58.30	0.14	1.32	0.28	2.62
Spain	Flesh	Rojal	3.74	16.74	2.06	0.4	30.13	0.064	0.146	0.611	169	907	33.61	2.25	58.80	0.13	1.40	0.26	2.25
Spain	Seed	Negra	16.10	10.37	2.25	1.65	64.37	0.00	0.00	0.00	468.00	956.00	173.00	3.69	303.00	0.70	4.62	1.78	3.69
Spain	Seed	Negra	15.98	9.81	2.86	1.71	59.16	0.00	0.00	0.00	468.00	956.00	173.00	3.69	303.00	0.70	4.62	1.78	3.69
Spain	Flesh	Negra	4.12	14.20	2.64	0.52	35.44	0.082	0.164	0.546	340	980	56.1	2.92	66.60	0.26	2.64	0.39	2.92
Spain	Flesh	Negra	4.10	14.62	2.6	0.52	35.14	0.079	0.167	0.546	340	980	56.1	2.92	66.60	0.26	2.64	0.39	2.92
Spain	Seed	Metalafera	14.79	9.84	2.86	2.17	24.92	0.00	0.00	0.00	423.00	928.00	144.00	1.80	276.00	0.61	4.15	1.50	1.80
Spain	Seed	Metalafera	14.70	9.95	2.84	2.21	24.90	0.00	0.00	0.00	423.00	928.00	144.00	1.80	276.00	0.61	4.15	1.50	1.80
Spain	Flesh	Metalafera	3.82	12.67	2.67	0.33	71.70	0.074	0.167	0.632	277	1012	34.6	3.48	54.70	0.15	1.44	0.34	3.48
Spain	Flesh	Metalafera	3.83	12.60	2.58	0.3	72.61	0.073	0.165	0.634	277	1012	34.6	3.48	54.70	0.15	1.44	0.34	3.48

