applied sciences

MDPI

Supplementary Materials

Table S1a. Minimum. maximum and mean values of the measured parameters for the Romanian and French honey samples.

Country (number of samples)	Value	Li	Na	Mg	Al	P	K	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Rb	Sr	Mo
		Concentration (mg/kg)																
Romania (50)	Min	0.01	3.55	4.47	0.03	0.12	64.41	0.01	0.06	0.17	0.30	0.00	0.12	0.00	0.12	0.09	0.01	0.00
	Max	0.68	153.04	143.53	90.19	293.25	1903.45	3.77	9.24	18.15	55.39	0.33	30.59	1.37	3.88	4.94	0.63	0.43
	Mean	0.07	20.23	28.09	3.06	65.44	349.39	0.37	3.45	2.05	18.16	0.04	2.12	0.28	0.86	0.77	0.14	0.12
France (53)	Min	0.00	0.52	4.55	0.02	29.05	78.31	0.00	0.36	0.25	0.34	0.00	0.00	0.02	0.13	0.11	0.00	0.01
	Max	0.19	262.99	294.58	88.54	461.98	3238.57	0.17	92.78	36.47	148.37	2.60	195.02	8.67	160.12	14.53	0.62	0.66
	Mean	0.03	28.23	42.35	4.94	85.35	553.94	0.09	5.46	4.68	27.05	0.09	5.09	0.52	4.16	2.15	0.12	0.17

Table S1b. Minimum. maximum and mean values of the measured parameters for the Romanian and French honey samples.

Country (number of samples)	Value	Ga	As	Y	Zr	Nb	Pd	Sn	Sb	Ba	La	Ce	Pr	Ir	δ^2H	$\delta^{18}O$	$\delta^{13}C_{honey}$	$\delta^{13}C_{protein}$
		Concentration (µg/kg)													Per mil (‰)			
Romania (50)	Min	0.50	7.00	0.50	0.50	0.50	0.50	27.50	0.50	2.50	0.50	0.50	0.50	0.50	−26.70	−4.10	−27.30	−28.06
	Max	26.00	994.50	29.00	171.00	17.50	45.00	267.50	3.50	1303.50	41.00	175.50	8.50	3.00	9.54	4.18	−23.40	−24.14
	Mean	4.21	159.95	8.49	14.65	5.96	3.43	141.68	0.84	154.36	2.18	16.44	0.89	1.00	−9.01	−0.57	−25.14	−26.02
France (53)	Min	0.50	0.50	2.50	0.50	8.00	0.50	15.00	0.50	7.50	0.50	0.50	0.50	0.50	−19.66	−2.97	−27.69	−27.64
	Max	28.00	28.00	134.50	8813.00	23.00	18.00	2420.50	40.00	1347.50	70.00	177.00	384.00	12.00	37.08	6.37	−23.03	−23.96
	Mean	3.41	4.64	12.92	0.20	16.64	3.04	126.28	2.31	240.18	4.03	8.99	9.94	2.31	7.88	1.52	−25.69	−26.01

Table S2. F scores resulted from applying Analysis of Variance. corresponding to each of the measured parameters.

	Li	Na	Mg	Al	P	K	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	As	Rb	Sr	Y	Zr	Nb	Mo	Pd	Sn	Sb	Ba	La	Ce	Pr	Ir	δ^2H	$\delta^{18}O$	$\delta^{13}C_{honey}$	$\delta^{13}C_{protein}$
F score	4.82	1.68	2.39	0.58	3.24	3.69	9.72	1.27	5.13	5.98	0.93	0.6	1.64	1.13	1.12	52.55	7.26	0.9	3	1.13	249.54	4.27	0.16	0.1	2.87	2.83	1.33	1.92	1.51	11.19	65.18	29.42	8.75	0.001

Table S3a. Average accuracies obtained by creating ANN structures with different learning rates and distinct number of hidden neurons; probability of dropout: 0.1

Number of Hidden Neurons \ Learning Rate	0.01	0.05	0.1	0.15	0.2
5	80.63	56.72	42.81	42.00	37.81
10	83.45	53.63	44.90	37.36	47.63
15	82.90	83.27	59.18	45.63	33.18
20	88.54	81.27	52.00	37.90	42.54
25	86.72	69.90	44.81	45.00	44.72
30	84.54	83.27	59.63	41.36	45.45
35	82.54	83.36	47.72	44.00	42.81

Table S3b. Average accuracies obtained by creating ANN structures with different learning rates and distinct number of hidden neurons; probability of dropout: 0.2

Number of Hidden Neurons \ Learning Rate	0.01	0.05	0.1	0.15	0.2
5	76.90	50.45	51.54	45.54	47.18
10	88.54	50.63	43.54	36.27	39.72
15	86.45	65.09	40.90	43.27	39.00
20	86.54	76.45	42.45	53.45	44.72
25	84.36	69.36	50.45	45.54	46.54
30	89.27	83.90	46.27	39.09	33.45
35	84.18	78.45	52.45	46.45	31.81

Table S3c. Average accuracies obtained by creating ANN structures with different learning rate specifications when constructing the Dropout layer and distinct number of hidden neurons; learning rate: 0.01

Number of Hidden Neurons \ Probability of Dropout	0.3	0.4	0.5
20	83.63	84.45	85.45
25	84.54	87.18	83.36
30	87.45	85.36	87.36
35	83.27	86.09	84.45