

THE PHYSICOCHEMICAL CHARACTERISTICS OF HONEY AND QUANTIFICATION OF SOME ANTI-MICROBIAL AGENTS IN HONEY FROM DIFFERENT SERBIAN REGIONS AS A QUALITY ASSESSMENT TOOL

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Supplementary Material

Table S2. Examined organochlorine pesticides and their retention times.

Pesticide	Retention time (min)
α -HCH	12.305
β -HCH	12.918
γ -HCH (Lindane)	13.007
δ -HCH	13.563
Heptachlor	14.460
Aldrin	15.150
Heptachlor epoxide	15.934
<i>trans</i> Chlordane	16.393
α -Endosulfan	16.624
<i>cis</i> Chlordane	16.667
<i>pp'</i> DDE	16.068
Dieldrin	17.117
Endrin	17.524
Endosulfan	17.701
<i>pp'</i> DDD	17.851
Endrin aldehyde	18.061
Endosulfansulphate	18.496
<i>pp'</i> DDT	18.550
Methoxychlor	18.803
Endrin ketone	19.344

Table S3. Retention time, molecule weight and ions important for the analysis.*

Pesticide	RT (min)	MW	T	Q1	Q2
α -HCH	11.28	290.8	183	181	219
β -HCH	12.47	290.8	219	181	183
γ -HCH (Lindane)	12.57	290.8	181	183	109
δ -HCH	13.74	290.8	109	219	183
Heptachlor	15.74	370	272	235	237
Aldrin	17.40	362	263	220	291
Heptachlor epoxide	19.55	386	353	81	355
<i>trans</i> Chlordane	20.88	406	373	375	-
α -Endosulfan	21.46	404	195	159	133
<i>cis</i> Chlordane	21.71	406	373	375	-
<i>pp'</i> DDE	22.84	378	79	277	239
Dieldrin	23.09	316	246	176	211
Endrin	23.80	378	263	191	226
Endosulfan	24.26	404	195	157	159
<i>pp'</i> DDD	24.90	318	235	165	237
Endrin aldehyde	25.065	378	67	345	-
Endosulfansulphate	25.97	420	272	274	387
<i>pp'</i> DDT	26.26	352	235	165	200
Methoxychlor	26.88	344	227	165	184
Endrin ketone	27.46	240	317	67	-

*Retention time – RT; molecular mass – MW; primary, target, ion – T; secondary and tertiary ion – Qualifier Ions, Q1 and Q2.

Table S4. SIM program applied for analysis.

Time (min)	Pesticide/ Group of pesticide	m/z	Total dwell time
10.78	α -HCH, β -HCH, γ -HCH, δ -HCH	181, 219, 109	150
14.98	Heptachlor	100, 237, 272	150
16.66	Aldrin	66, 263, 293	150
18.84	Heptachlor epoxide	81, 353, 237, 263	200
20.37	<i>cis/trans</i> Chlordane, Endosulfan I	373, 237, 272, 195, 237, 170	300
22.38	Dieldrin, <i>pp'</i> DDE	79, 263, 246, 176, 318	250
23.45	Endrin, Endosulfan II	81, 67, 263, 245, 195, 237, 243	350
24.62	<i>pp'</i> DDD, Endrin aldehyde	235, 165, 67, 173, 250	250
25.29	<i>pp'</i> DDT, Endosulfansulphate	165, 235, 237, 275, 387, 422	300
26.56	Methoxychlor	227, 152	100
27.14	Endrin ketone	67, 317, 345	150

Table S5. Validation data for the listed pesticides.

Pesticide	Precision (%)	Reproducibility (%)	Accuracy (%)	Linearity (r^2)	LOQ (mg/kg)	LOD (mg/kg)
α -HCH	1.20874	12.31710	112.75304	0.99853	0.00451	0.00135
β -HCH	5.85603	7.58655	112.36659	0.99672	0.00457	0.00137
γ -HCH (Lindane)	7.35402	9.05507	100.80005	0.99768	0.00496	0.00149
δ -HCH	4.74408	14.03158	112.41577	0.99792	0.00100	0.00030
Heptachlor	8.94628	17.16411	118.17588	0.99603	0.00358	0.00108
Aldrin	3.51919	11.58078	103.24248	0.99847	0.00451	0.00135
Heptachlor epoxide	7.87525	6.83867	96.08820	0.99787	0.00210	0.00063
<i>trans</i> Chlordane	10.21934	5.10399	98.62626	0.99825	0.00357	0.00107
α -Endosulfan	6.13672	14.86338	95.19121	0.99792	0.00237	0.00071
<i>cis</i> Chlordane	12.81811	4.76600	94.15898	0.99810	0.00320	0.00096
<i>pp'</i> DDE	11.21875	12.58085	96.76469	0.99871	0.00483	0.00145
Dieldrin	7.26587	12.52852	89.40030	0.99796	0.00459	0.00138
Endrin	9.24630	12.86689	101.47781	0.99408	0.00341	0.00102
Endosulfan	9.64287	10.62710	93.91650	0.99781	0.00459	0.00138
<i>pp'</i> DDD	5.21497	3.62948	113.30032	0.99524	0.00430	0.00129
Endosulfansulphate	5.65242	12.30613	113.54725	0.99534	0.00489	0.00147
<i>pp'</i> DDT	6.10376	9.66530	103.42179	0.99479	0.00466	0.00140
Endrin aldehyde	3.71780	13.36805	116.29021	0.99129	0.00490	0.00147
Methoxychlor	2.94677	13.30149	94.04154	0.99664	0.00465	0.00140
<i>min</i>	1.20874	3.62948	89.40030	0.99129	0.00100	0.00030
<i>max</i>	12.81811	17.16411	118.17588	0.99871	0.00496	0.00149

*r – correlation coefficient; LOQ – limit of quantification; LOD – limit of detection.

Table S6. Data from internal control for spike sample of honey (true value of spike sample is 0.05 mg/kg).

Matrix	N	Xsr	Stdev	RSD (%)	Bias (%)	Recovery (%)
Honey	15	0.052	0.005	9.62	3.960	103.960