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Supplementary material

SUPPLEMENTARY MATERIAL TO

Reishi (*Ganoderma lucidum*) tincture enriched with propolis or green tea from Serbia: UHPLC-DAD–ESI-MS characterization, mineral content and antibacterial activity

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TABLE S-I. Parameters of the calibration line for the determined elements

Element	λ / nm	R / 1	*ROL* / mg·L^{-1}
Ag	224.641	0.99993	0.00532-12
	328.068	0.99995	0.00166-12
As	189.042	0.99982	0.00255-3.6
	197.262	1	0.00825-2.4
B	182.641	0.99999	0.00737-12
	249.773	0.99999	0.00643-12
Ba	233.527	0.99995	0.000115-12
Bi	190.241	0.99991	0.00353-12
	223.061	0.99996	0.00368-12
Ca	183.801	1	1.6-12
	396.847	1	0.0126-2.41
Cd	214.438	0.99989	0.000111-2.4
Ce	418.660	0.999917	0.00118-2.4
Co	228.616	0.99980	0.000327-12
Cr	283.563	0.99998	0.000435-12
Cu	224.700	0.99999	0.000907-12
	324.754	0.99999	0.000259-12
Fe	259.941	0.99995	0.00199-12
Hg	184.950	0.99992	0.000192-12
	194.227	0.99994	0.000579-12
	253.652	0.99986	0.00202-12
In	325.609	1	0.004-12
K	404.721	0.99996	0.156-60

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Li	323.261	1	0.798-12
	670.780	0.99997	0.0000574-1.2
Mg	285.213	0.99996	0.00206-12.1
Mn	257.611	0.99997	0.000105-12
Na	330.237	0.99995	0.798-12
	589.592	1	0.00583-1.2
Ni	231.604	0.99994	0.000474-12
P	214.914	0.99995	0.00-120
Pb	220.353	0.99998	0.00616-12
S	180.731	1	0.0029-24
Si	288.158	0.99998	0.00582-60
	251.612	0.99998	0.00124-60
Tl	190.864	0.99998	0.00172-12
Zn	213.856	0.99997	0.000082-12

TABLE S-II. The compounds detected by UHPLC-DAD-MS/MS in the pure Reishi tincture

Peak No.	t_R / min	λ_{max} / nm	[M-H]$^-$, *m/z*	MS/MS fragment ion peaks, *m/z*	Compounds assignment	Reference
1	1.11	280, 350	-	-	-	-
2	1.57	306	-	-	-	-
3	2.28	328	[M+H]$^+$ 301	[a]297.7 (100 %), 255	n.i. phenolic acid	Robbins[1]
4	2.95	280, 450	-	-	-	-
5	3.38	327	[M+H]$^+$ 301	[a]280, 264, 254, 245, 187.9 (100 %), 121	n.i. phenolic acid	Robbins[1]
6	5.81	304	[M+H]$^+$ 240	[a]217 (100 %), 199, 195	n.i. phenolic acid	Robbins[1]
7	7.46	333	175	147 (100 %), 131	n.i. phenolic acid	Robbins[1]
8	8.83	260, 366	373	329 (100 %), 305, 263, 178, 151	n.i. flavonoid	Rijke *et al.*[2]
9	10.10	309	401	-	tent. Lucidone A	Yan *et al.*[3]
			[M+Na]$^+$ 425	[a]407, 226, 161	-	
10	10.70	245	569	-	12-acetoxyganoderic acid F	Chen *et al.*[4]; Ryu *et al.*[5]
11	11.00	237, 315	399	370, 353 (100 %), 337, 325, 309, 159	-	-
			[M+Na]$^+$ 423	377 (100 %), 408, 286, 159	-	-
12	11.55	258	531	-	Ganoderic acid G type A	Chen *et al.*[4]
			[M+Na]$^+$ 555	549.8, 547, 527, 510, 497 (100 %)	Ganoderic acid G or methyl lucidenate	Chen *et al.*[4]
13	11.65	-	[M+Na]$^+$ 555	537, 527, 508.66 (100 %), 490.62, 365, 283	Ganoderic acid G or methyl lucidenate	Chen *et al.*[4]

[a]Positive ionization mode

TABLE S-III. The compounds detected by UHPLC-DAD-MS/MS in the Reishi/green tea tincture

Peak No.	t_R / min	λ_{max} / nm	$[M-H]^-$, *m/z*	MS/MS fragment ion peaks, *m/z*	Compounds assignment	Reference
1	0.90	-	343	191 (100 %), 169	3-*O*-galloyl quinic acid	Wyrepkowski *et al.*[6]
2	1.13	287	305	261, 219, 179 (100 %), 175, 159, 137	Gallocatechin	Markowicz Bastos *et al.*[7]
3	1.24	324	229	183, 161 (100 %), 143	n.i.	
4	1.54	277, 337	305	261, 219, 179 (100 %), 175, 167, 137, 125	Epigallocatechin	Markowicz Bastos *et al.*[7]
5	1.77	275	-	-	n.i.	
6	2.23	329	-	-	Phenolic acid derivative	Robbins[1]
7	3.10	274	289	245 (100 %), 231, 203, 175, 161, 137	Catechin/Epicatechin	MassBankRecord[8a]; Markowicz Bastos *et al.*[7]
8	3.55	312	457	-	Epigallocatechin gallate	Markowicz Bastos *et al.*[7]
9	4.69	272, 334	563	473, 443, 383, 353 (100 %), 297	Apigenin 6(or 8)-C-xyloside-8(or 6)-C-glucoside (vicenin 1)	Benayad *et al.*[9]
10	5.12	259, 355	771	-	Apigenin 6-C-glucosyl 8-C-(2"-O-dihydroferuloyl)-glucoside	Benayad *et al.*[9]
11	5.28	264, 351	609	301 (100 %), 271, 255, 228	Rutin	Standard
12	5.45	271, 349	463	343, 301 (100 %), 271, 243, 151	Quercetin-glycoside	Zhao *et al.*[10]
13	5.63	266, 350	593	285 (100 %), 255, 241, 199, 185	Kaempferol 3-O-rutinoside	Jiang *et al.*[11]
14	5.80	268, 312	447	285 (100), 255, 227, 137	Kaempferol-O-glycoside	Jiang *et al.*[11]; Zhao *et al.*[10]
15	7.45	333	583	539 (100 %), 469, 395, 243	n.i.	
16	8.85	257, 357	373	329 (100 %), 305, 263, 192, 177, 151	n.i.	
17	10.12	308	401	383, 355	Lucidone A	Yan *et al.*[3]

[a]PR100687/PR100688

TABLE S-IV. The compounds detected by UHPLC-DAD-MS/MS in the Reishi/propolis tincture

Peak No.	t_R / min	λ_{max} / nm	$[M-H]^-$, *m/z*	MS/MS fragment ion peaks, *m/z*	Compounds assignment	Reference
1	1.97	311, 282	137	136, 109	Hydroxybenzoic acid	MassBankRecord[8a]
2	2.71	323, 290	179	135	Caffeic acid	MassBankRecord[8b]; Cornard and Lapouge[12]
3	4.71	310	163	119	*p*-coumaric acid	MassBankRecord[8c]; Pellati *et al.*[13]
4	5.20	323, 290	281	179, 161, 135 (100 %)	Caffeic acid derivate	-
5	5.47	323, 298	303	285 (100 %), 177	Dihydroquercetin	MassBankRecord[8d]; Ye *et al.*[14]
6	5.60	-	623	315, 300, 271	Isorhamnetin-3-O-rutinoside	Fuentes-Alventosa *et al.*[15]
7	5.82	257, 340	447	301 (100 %), 285, 271, 255	Quercetin-O-rhamnoside	MassBankRecord[8e]
8	6.45	322, 290	431	268 (100 %), 239, 211, 167, 153	Genistin	Ye *et al.*[14]
9	6.92	257, 370	301	-	Quercetin	Pellati *et al.*[13]; standard
10	7.13	289, 320	285	267 (100 %), 252, 239, 224	Pinobanksin-5-methyl-ether	Pellati *et al.*[13]
11	7.22	350, 252	315	300	Quercetin-3-methyl-ether	Pellati *et al.*[13]
12	7.33	280	315	300	n.i.	
13	7.41	310, 293	349	-	n.i.	
14	7.62	338, 267	269	225, 201, 197, 183, 151, 149, 117	Apigenin	Sánchez-Rabaneda *et al.*[16]; standard
15	7.81	293, 330	271	253	Pinobanksin	Pellati *et al.*[13]
16	8.17	267, 350	299	284 (100), 255, 227, 179, 135	Luteolin-methyl-ether	Pellati *et al.*[13]
17	8.70	354, 261	283	268, 239 (100 %), 211	Galangin-5-methyl-ether	Pellati *et al.*[13]
18	9.04	312	449	421, 137	n.i.	
19	9.38	258, 358	329	314 (100), 299, 271	Quercetin-dimethyl-ether	Pellati *et al.*[13]
20	9.89	325, 300	247	179 (100 %), 161, 135	Caffeic acid isoprenyl ester	Falcão *et al.*[17]
21	10.05	327, 300	269	225, 178, 161, 134 (100 %)	Caffeic acid benzyl ester	Pellati *et al.*[13]
22	10.16	-	247	203, 179 (100 %), 135, 121	Caffeic acid isoprenyl ester – isomer	Falcão *et al.*[17]
23	10.27	291, 356	255	213 (100 %), 193, 183, 151, 145	Pinocembrin	Falcão *et al.*[17]
24	10.53	296	313	271, 253 (100 %)	Pinobanksin-3-O-acetate	Falcão *et al.*[17]
25	10.69	345, 266	283	268, 239, 179 (100 %), 161, 135	Methoxy-chrysin	Pellati *et al.*[13]
26	11.21	325, 297, 250	295	211	n.i.	
27	11.45	293, 320	327	271, 253 (100 %)	Pinobanksin-3-O-propionate	Falcão *et al.*[17]
28	12.10	292, 330	341	-	Pinobanksin-3-O-butyrate	Pellati *et al.*[13]
29	12.54	293, 330	355	271, 253 (100 %)	Pinobanksin-3-O-pentanoate	Pellati *et al.*[13]

[a]PR100187; [b]KO000512; [c]PR100685; [d]BML01276; [e]PR100993

Fig. S-1. a) Ganoderic acid G type A

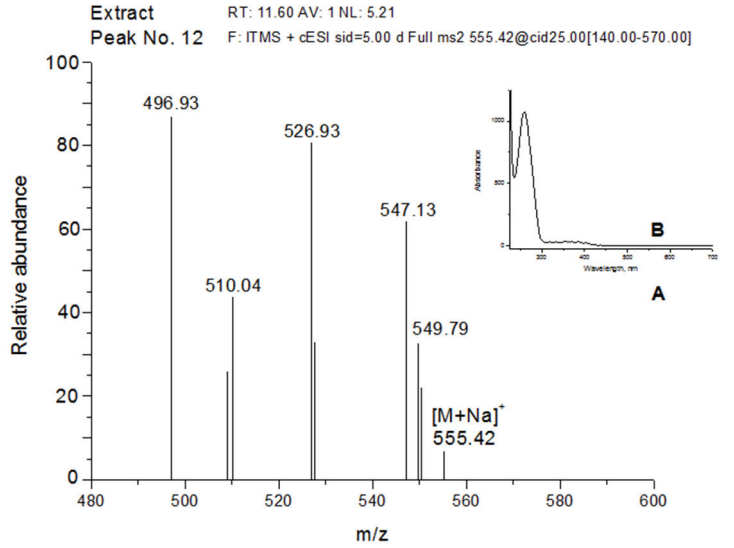


Fig. S-1. b) Gallocatechin

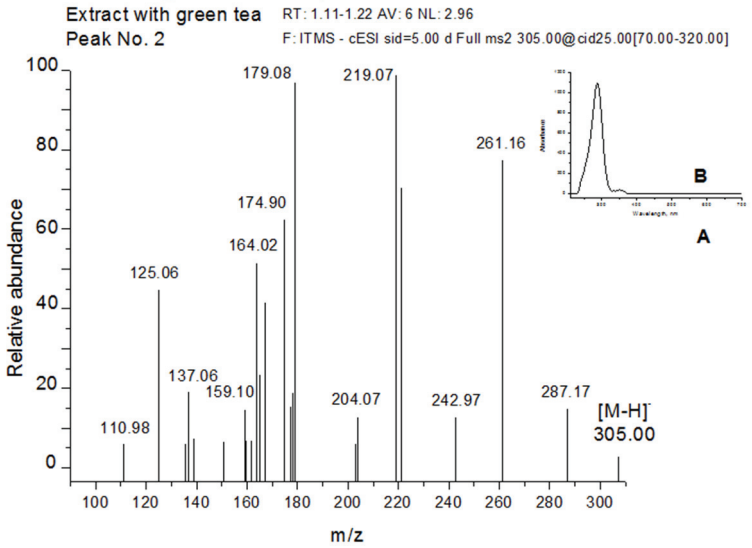
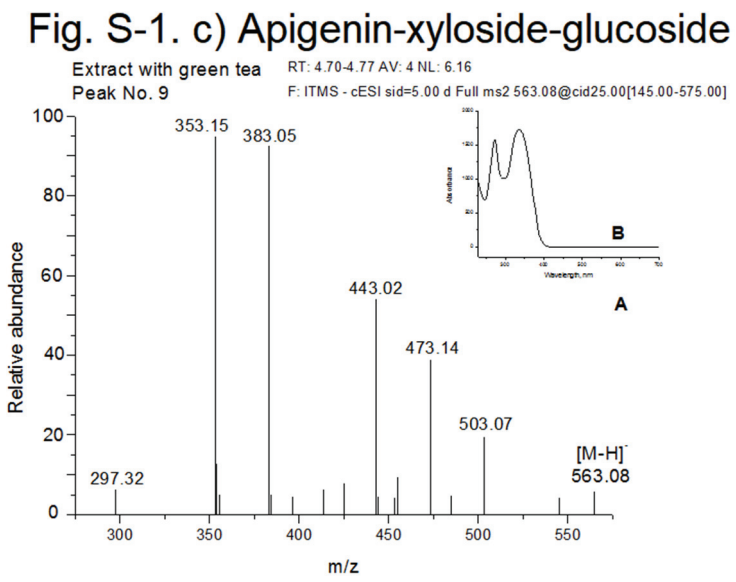


Fig. S-1. Mass (A) and UV-Vis (B) spectra of selected compounds from chromatograms of pure Reishi tincture (a) and Reishi/green tea tincture (b-d). a) Compound No. 12 (Fig. 1a), assigned as ganoderic acid G type A (Table S-I); b) Compound No. 2 (Fig. 1b), assigned as gallocatechin (Table S-II);



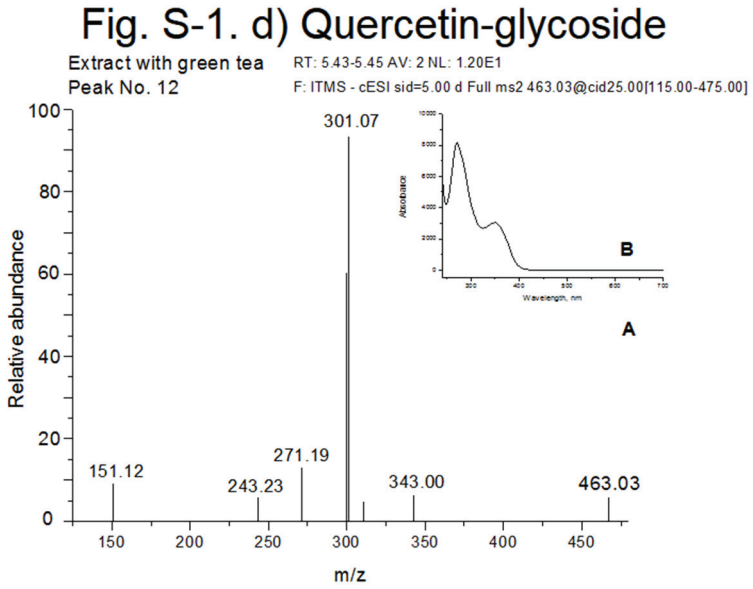
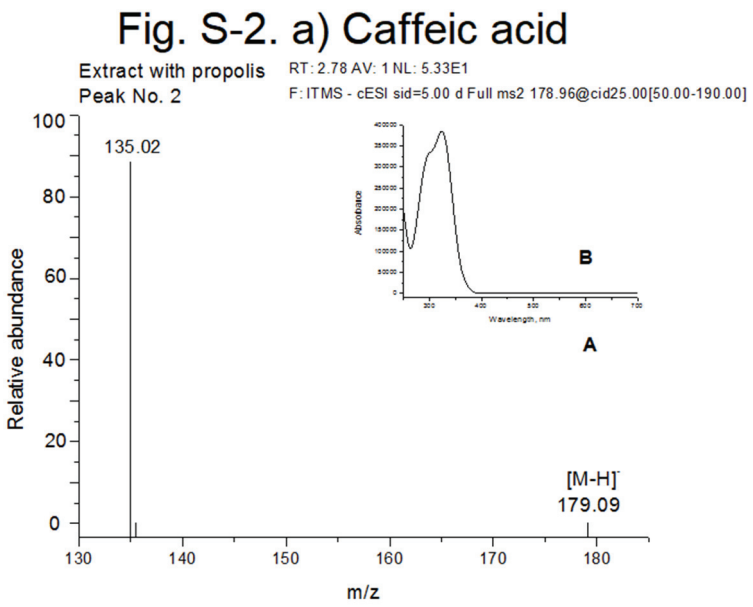


Fig. S-1. Continued c) Compound No. 9 (Fig. 1b), assigned as apigenin-xyloside-glucoside (Table S-II); d) Compound No. 12 (Fig. 1b), assigned as quercetin-glycoside (Table S-II).



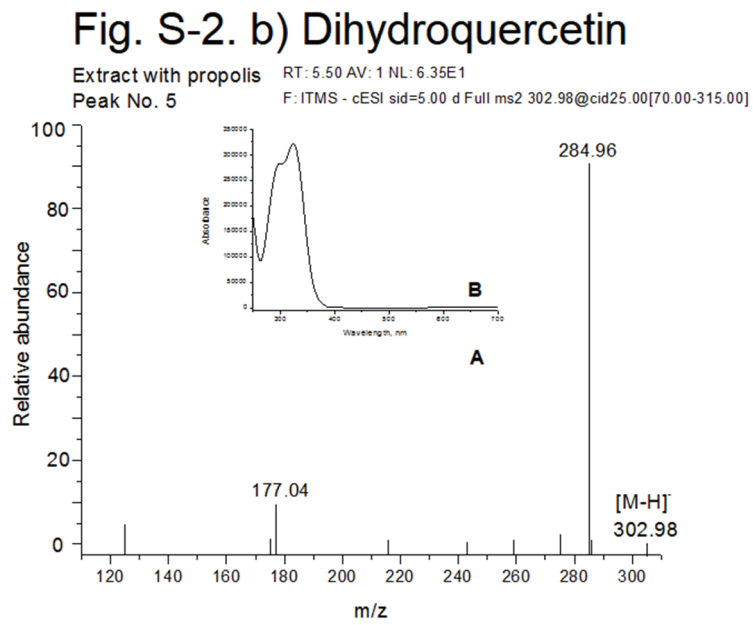


Fig. S-2. Mass (A) and UV-Vis (B) spectra of selected compounds from chromatogram of Reishi/propolis tincture. a) Compound No. 2 (Fig. 1c), assigned as caffeic acid (Table S-III); b) Compound No. 5 (Fig. 1c), assigned as dihydroquercetin (Table S-III);

Fig. S-2. c) Genistin

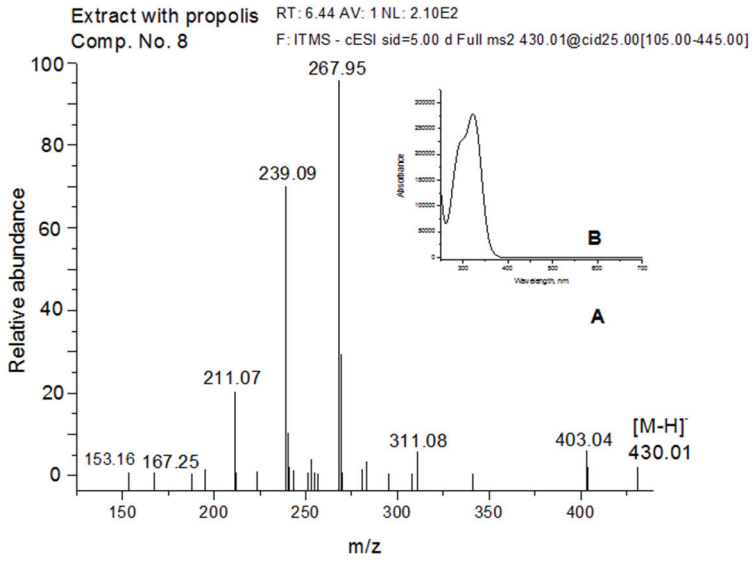


Fig. S-2. d) Pinocembrin

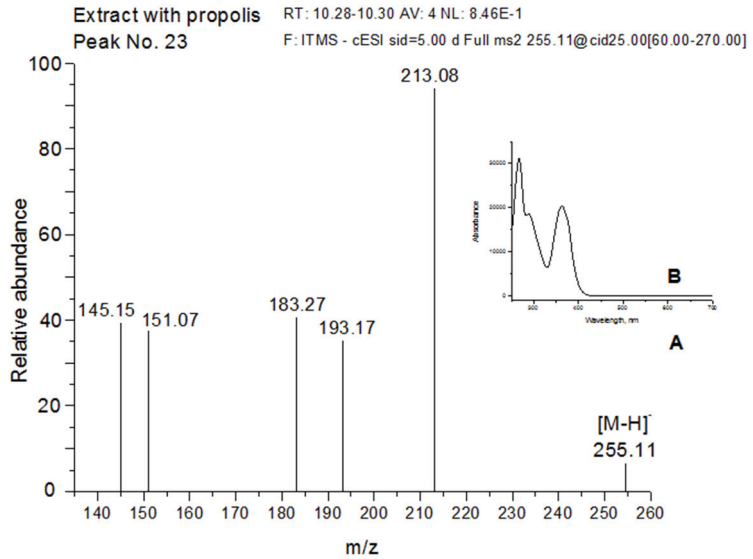


Fig. S-2. Continued c) Compound No. 8 (Fig. 1c), assigned as genistin (Table S-III); d) Compound No. 23 (Fig. 1c), assigned as pinocembrin (Table S-III).

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