

Supporting information for

Comparative Phytochemical Profiling and Cytotoxic Activity of *Ranunculus polyanthemus* L. and *Ranunculus oxyspermus* M.B. Extracts on HepG2 Hepatocellular Carcinoma and L6 Myoblasts

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DOI: <https://dx.doi.org/10.30919/faf1897>

Table S1: Chemical composition (%) *R. oxyspermus* and *R. polyanthemus*: 1 - *R. polyanthemus* flower ethanolic extract, 2 - *R. polyanthemus* stem and leave ethanolic extract, 3 – *R. polyanthemus* root ethanolic extract, 4 - *R. oxyspermus* flower ethanolic extract, 5 - *R. oxyspermus* stem and leave ethanolic extract, 6 – *R. oxyspermus* root ethanolic extract.

No.	Rt (min)	Compounds	Molecular Formula	Compound classes	Pharmacological activity	Distribution					
						1	2	3	4	5	6
1	4.69	Muriolide	C ₁₅ H ₁₈ O ₈	Other	Anti-oxidant Anti-inflammatory ^[1]	+		+	+	+	+
2	0.87	Columbamine	C ₂₀ H ₂₀ NO 4	Alkaloid	Anti-oxidant Anti-inflammatory Lipid-lowering Anti-bacterial Anti-cancer ^[2,3]			+			+
3	3.66	Ternatoside B	C ₁₉ H ₂₈ O ₁₀	Alkaloid	Anti-tuberculosis ^[4]	+			+	+	+
4	3.7	Quercetin 3-O-rutinoside- 7-O-glucoside	C ₃₃ H ₄₀ O ₂₁	Flavonoid	Anti-oxidant ^[5]	+			+	+	+
5	4.41	Scopoletin	C ₁₀ H ₈ O ₄	Flavonoid Coumarin	Anti-oxidant Anti-inflammatory Anti-bacterial Neuroprotective Hepatoprotective ^[6,7]			+	+		+
6	5.87	Quercetin 3-O-(2-t-p- coumaroyl)-β-D- glucopyrnanosyl-(1->2)-β- D-glucopyranoside-7-O- β-D-glucopyranoside	C ₄₂ H ₄₆ O ₂₄	Flavonoid	-	+	+				+
7	6.32	Rutin	C ₂₇ H ₃₀ O ₁₆	Flavonoid	Anti-oxidant Anti-inflammatory ^[8]	+	+		+	+	+
8	6.77	Orientin	C ₂₁ H ₂₀ O ₁₁ 1	Flavonoid	Anti-oxidant Anti-inflammatory Neuroprotective Cardioprotective Anti-diabetic ^[9,10]	+	+		+	+	+
9	7.58	Scoparone	C ₁₁ H ₁₀ O ₄	Coumarin	Anti-oxidant Anti-inflammatory Immunomodulatory Antifungal Vasodilator Hepatoprotective ^[11]		+		+	+	+
10	8.35	Tricin 5-glucoside	C ₂₃ H ₂₄ O ₁₂	Flavonoid	Anti-oxidant Anti-inflammatory Neuroprotective Cardioprotective ^[12]	+	+		+	+	+
11	21.58	Ternatoside D	C ₃₀ H ₃₃ N ₃ O ₁₁	Alkaloid	Anti-tuberculosis ^[13]					+	+
12	25.66	R-(+)-4- methoxydalbergion	C ₁₆ H ₁₄ O ₃	Other	-						+
13	33.47	C16:0	C ₁₆ H ₃₂ O ₂	Glycolipid and fatty acids	-	+	+	+	+	+	+
14	38.36	Digalactosyldiacylglycero l (C18:3/C18:3)	C ₅₁ H ₈₄ O ₁₅	Glycolipid and fatty acids	-	+	+	+	+	+	+

15	38.45	Daucosterol	C ₃₅ H ₆₀ O ₆	Steroid and triterpenoid	Anti-oxidant Anti-inflammatory Immunomodulatory Neuroprotective Anti-cancer Anti-diabetic ^[14,15]	+	+	+	+	+	+
16	39.87	Linolipin H	C ₄₅ H ₇₂ O ₁₁	Glycolipid and fatty acids	-	+	+			+	+
17	3.16	HBA	C ₇ H ₆ O ₃	Phenol	-	+	+	+	+	+	+
18	39.99	Linolipin E	C ₄₃ H ₆₆ O ₁₂	Glycolipid and fatty acids	-		+				+
19	37.2	Linolipin I	C ₄₉ H ₈₄ O ₁₆	Glycolipid and fatty acids	-	+	+	+		+	+
20	0.71	Ranunculone C	C ₁₆ H ₁₄ O ₈	Other	-		+	+			+
21	27.43	Stigmasterol	C ₂₉ H ₄₈ O	Steroid and triterpenoid	Anti-oxidant Anti-inflammatory Anti-diabetic Immunomodulatory Anti-cancer ^[16]	+			+	+	+
22	34.82	Stigmast-4-ene-3,6-dione	C ₂₉ H ₄₆ O ₂	Steroid and triterpenoid	Anti-oxidant Anti-inflammatory Hypolipidemic Analgesic Antipyretic Anti-cancer ^[17]					+	+
23	0.6	Linolipin D	C ₅₁ H ₈₀ O ₁₇	Glycolipid and fatty acids	-	+	+	+	+		+
24	0.6	Ranuncosid	C ₁₁ H ₁₆ O ₈	Other	Anti-cancer Cardiotonic ^[18]				+	+	+
25	13.11	(7Z,10Z)-hexadecadienoic acid	C ₁₆ H ₂₈ O ₂	Glycolipid and fatty acids	-	+	+		+	+	+
26	2.17	Esculin	C ₉ H ₆ O ₄	Coumarin	Vasoprotective ^[19]	+	+	+		+	+
27	0.82	β-amyrin	C ₃₀ H ₅₀ O	Steroid and triterpenoid	Anti-inflammatory Anti-bacterial Neuroprotective ^[20,21]				+	+	+
28	39.77	DLGG	C ₄₅ H ₇₄ O ₁₀	Glycolipid and fatty acids	Inhibitory activity against superoxide formation ^[22]	+	+	+		+	+
29	23.3	C20:0	C ₂₀ H ₄₀ O ₂	Glycolipid and fatty acids	-	+	+	+	+		
30	1.53	Vanilic acid	C ₈ H ₈ O ₄	Flavonoid Phenol	Anti-oxidant Anti-inflammatory Anti-bacterial ^[23]					+	+
31	2.17	Scopolin	C ₁₆ H ₁₈ O ₉	Flavonoid Coumarin	Anti-oxidant Anti-inflammatory Anti-microbial ^[24]			+	+	+	
32	3.58	Quercetin 3,7-diglucoside	C ₂₇ H ₃₀ O ₁₇	Flavonoid	Anti-oxidant ^[25]	+	+			+	+

33	3.56	Ferulic acid	C ₁₀ H ₁₀ O ₄	Flavonoid Phenol	Anti-oxidant Anti-inflammatory Cardioprotective ^[26]	+	+		+	+
34	4.81	Kayaflavone	C ₃₃ H ₂₄ O ₁₀	Flavonoid	Anti-virus Anti-bacterial Anti-cancer ^[27,28]	+	+		+	+
35	5.19	3-[(2R,3R,4S,5S,6R)-4,5-Dihydroxy-6-hydroxymethyl-3-((2S,3R,4S,5S,6R)-3,4,5-trihydroxy-6-hydroxymethyl-tetrahydro-pyran-2-yloxy)-tetrahydro-pyran-2-yloxy]-5,8-dihydroxy-2-(4-hydroxy-phenyl)-7-methoxy-chromen-4-one	C ₂₈ H ₃₂ O ₁₇	Flavonoid	Anti-oxidant Anti-inflammatory Neuroprotective ^[29]	+	+		+	+
36	16.8	Mutabilein	C ₁₆ H ₁₂ O ₅	Alkaloid	Anti-oxidant ^[30]	+	+		+	+
37	8.28	1,4,6-trihydroxy-9,10-anthraquinone	C ₁₄ H ₈ O ₅	Anthracycli ne and quinone derivative	Anti-bacterial Anti-cancer ^[31]	+			+	+
38	6.54	Isoquercetin	C ₂₁ H ₂₀ O ₁₂	Flavonoid	Anti-oxidant Anti-inflammatory ^[32]	+	+		+	+
39	6.76	Lut	C ₁₅ H ₁₀ O ₆	Flavonoid	Anti-oxidant Anti-inflammatory Neuroprotective ^[33]	+	+		+	+
40	7.89	Isovitexin	C ₂₁ H ₂₀ O ₁₀	Flavonoid	Anti-oxidant Anti-inflammatory ^[34]	+	+		+	+
41	7.89	Vitexin	C ₂₁ H ₂₀ O ₁₀	Flavonoid	Anti-oxidant Anti-inflammatory Neuroprotective Cardioprotective ^[35,36]	+	+		+	+
42	8.34	Cauloside D	C ₅₃ H ₈₆ O ₂₂	Other	Anti-inflammatory ^[37]	+			+	
43	12.09	Tricin	C ₁₇ H ₁₄ O ₇	Flavonoid	Anti-oxidant Anti-inflammatory Anti-cancer ^[38]	+	+		+	+
44	0.63	Oresbiusin A	C ₁₀ H ₁₂ O ₅	Other	Anti-oxidant Anti-inflammatory ^[39,40]	+			+	+
45	0.63	Ternatusine A	C ₁₆ H ₂₁ NO ₈	Alkaloid	-					+
46	0.64	Isoranunculin	C ₁₁ H ₁₆ O ₈	Other	-				+	+
47	0.67	Coumaric acid	C ₉ H ₈ O ₃	Flavonoid Coumarina Phenol	Anti-oxidant Anti-inflammatory Anti-microbial ^[41]	+	+		+	+
48	5.53	7,3'-dihydroxy-5'-methoxyisoflavone	C ₁₆ H ₁₂ O ₅	Flavonoid	Anti-cancer ^[42]					+
49	5.53	Ranunsceleroside B	C ₂₁ H ₂₄ O ₁₁	Other	-		+		+	
50	16.8	Ternatin A	C ₁₇ H ₁₄ O ₆	Other	Cytotoxicity ^[43]	+	+		+	+
51	6.99	3-[(2S,3R,4S,5R,6R)-6-(2-Carboxy-acetoxymethyl)-4,5-dihydroxy-3-	C ₂₉ H ₃₁ O ₁₉	Other	-				+	+

		((2S,3R,4S,5R)-3,4,5-trihydroxy-tetrahydro-pyran-2-yloxy)-tetrahydro-pyran-2-yloxy]-5,7-dihydroxy-2-(3,4,5-trihydroxy-phenyl)-chromenylium							
52	39.88	3-O-quercetin	C ₃₅ H ₃₄ O ₁₉	Flavonoid	Anti-oxidant ^[44]	+		+	+
53	4.14	Quercetin 3-O-(6"-malonyl-glucoside) 7-O-glucoside	C ₃₀ H ₃₂ O ₂₀	Flavonoid	Anti-oxidant Anti-inflammatory ^[45]				+
54	6.52	n-butyl (R)-3-[2-(3,4-dihydroxybenzoyl)-4,5-dihydroxyphenyl]-2-hydroxypropanoate	C ₂₀ H ₂₂ O ₈	Phenol	-				+
55	24.14	Ranunculoside B	C ₂₆ H ₄₂ O ₈	Other	Anti-oxidant Anti-inflammatory Anti-microbial ^[46,47]				+
56	32.92	Linolipin G	C ₄₃ H ₇₀ O ₁₁	Glycolipid and fatty acids	-	+	+		+
57	36.8	Linolipin C	C ₅₁ H ₈₂ O ₁₆	Glycolipid and fatty acids	-		+	+	+
58	39.99	Linolipin F	C ₄₃ H ₆₈ O ₁₁	Glycolipid and fatty acids	-		+	+	+
59	36.97	Linolipin B	C ₄₅ H ₇₀ O ₁₂	Glycolipid and fatty acids	-		+		
60	0.68	Ternatolide	C ₅ H ₆ O ₃	Alkaloid	Anti-bacterial ^[48]	+		+	+
61	0.69	Quercetin 3-O-sophoroside	C ₂₇ H ₃₀ O ₁₇	Flavonoid	Anti-oxidant ^[49]		+		+
62	36.52	Cyanidin 3-xylosyl-galactoside	C ₄₀ H ₅₆ O ₃	Flavonoid	Anti-oxidant ^[50]	+	+		+
63	23.8	βSS	C ₂₉ H ₅₀ O	Steroid and triterpenoid	-				+
64	1.65	Dihydro-Oxyphenolic Lactone	C ₉ H ₁₀ O ₅	Phenol	Anti-oxidant Anti-inflammatory Anti-microbial ^[51]	+		+	+
65	1.65	Methyl (R)-3-[2-(3,4-dihydroxybenzoyl)-4,5-dihydroxyphenyl]-2-hydroxypropanoate	C ₁₇ H ₁₆ O ₈	Phenol	Anti-oxidant Anti-inflammatory Anti-microbial ^[52]		+	+	
66	7.15	Berberine	C ₂₀ H ₁₈ NO ₄	Isoquinoline alkaloid	Anti-oxidant Anti-microbial Neuroprotective Cardioprotective ^[53]			+	
67	4.69	Quercetin 3-O-(2"-O-(β-D-xylopyranosyl)-β-D-glucopyranoside)-7-O-β-D-glucopyranoside	C ₃₂ H ₃₈ O ₂₁	Quercetin glycosides Flavonol	Anti-oxidant Anti-inflammatory Anti-microbial ^[54]	+		+	
68	4.81	Ranunchinesin A	C ₁₂ H ₁₆ O ₇	Specific glycoside	Anti-oxidant Anti-microbial	+		+	

					Neuroprotective Cardioprotective ^[55]		
69	2.94	Quercetin 3-O-sophoroside-7-O-glucoside_1	C ₃₃ H ₄₀ O ₂₂	Quercetin glycosides	Anti-oxidant Anti-microbial Neuroprotective Cardioprotective Anti-diabetic ^[56]	+	+
70	3.6	Kaempferol 3-O- α -L-arabinopyranosyl-(1 $\rightarrow$ 2)- β -D-galactopyranoside-7-O- β -D-glucopyranoside	C ₃₂ H ₃₈ O ₂₀	Kaempferol glycoside, Flavonol	Anti-oxidant Anti-inflammatory Anti-microbial Neuroprotective Cardioprotective ^[57]	+	
71	3.64	3-O--7-O- β -D-glucopyranosylquercetin	C ₄₁ H ₄₄ O ₂₄	Quercetin glycosides	Anti-oxidant Anti-inflammatory Anti-microbial ^[58]	+	
72	4.22	3-[2-O-- β -D-galactopyranosyloxy]-7-(β -D-glucopyranosyloxy)-5-hydroxy-2-(4-hydroxyphenyl)-4H-1-benzopyran-4-one	C ₄₁ H ₄₄ O ₂₃	Flavonoid diglycoside	Anti-oxidant Anti-inflammatory Anti-microbial ^[59]	+	+
73	4.22	Quercetin 3-(2'''-caffeylsophoroside)-7-glucoside	C ₄₂ H ₄₆ O ₂₅	Acylated glycoside of quercetin	Anti-oxidant Anti-inflammatory Anti-microbial ^[60]	+	+
74	5.33	Quercetin 3-O- β -D-(2-E-ferulyl- β -D-glucopyranosyl(1->2)glucopyranoside)-7-O- β -D-glucopyranoside	C ₄₃ H ₄₈ O ₂₅	Acylated glycoside of quercetin	Anti-oxidant Anti-inflammatory Anti-microbial ^[61]	+	+
75	6.43	3-[2-O-- β -D-galactopyranosyloxy]-5,7-dihydroxy-2-(4-hydroxyphenyl)-4H-1-benzopyran-4-one	C ₃₅ H ₃₄ O ₁₈	Flavonoid 3-O-glycoside	Anti-oxidant Anti-inflammatory Anti-microbial ^[62]	+	+
76	7.18	Ranunsceleroside A	C ₁₈ H ₂₄ O ₈	Glycoside compound	Anti-oxidant Anti-inflammatory Anti-microbial ^[63]	+	+
77	7.9	Ranuncoside	C ₁₉ H ₃₀ O ₇	Glycoside compound	Anti-oxidant Anti-inflammatory Anti-microbial ^[64]	+	+
78	9.77	(E)-3-(4-Hydroxy-3-methoxy-phenyl)-acrylic acid (2S,3R,4S,5S,6R)-2-[5,8-dihydroxy-2-(4-hydroxy-phenyl)-7-methoxy-4-oxo-4H-chromen-3-yloxy]-4,5-dihydroxy-6-hydroxymethyl-tetrahydro-pyran-3-yl ester	C ₃₂ H ₃₀ O ₁₅	Acylated flavonoid glycoside	Anti-oxidant Anti-microbial Neuroprotective Cardioprotective Anti-diabetic Anti-cancer ^[65]	+	
79	10.08	7-O-methylgossypetin	C ₁₆ H ₁₂ O ₈	Flavonoid	Anti-oxidant Anti-microbial ^[66]	+	+

80	3.51	Quercetin 3-O-(2''-O-((2'''-trans-caffeyl)-β-D-xylopyranosyl)-β-D-glucopyranoside)-7-O-β-D-glucopyranoside	C ₄₁ H ₄₄ O ₂₄	Acylated quercetin diglycoside	Anti-oxidant Anti-microbial Neuroprotective Cardioprotective Anti-diabetic Anti-cancer ^[67]	+
81	5.61	3-[(2S,3R,4S,5R,6R)-4,5-Dihydroxy-6-hydroxymethyl-3-((2S,3R,4S,5R)-3,4,5-trihydroxy-tetrahydro-pyran-2-yloxy)-tetrahydro-pyran-2-yloxy]-5,7-dihydroxy-2-(3,4,5-trihydroxy-phenyl)-chromenylium	C ₂₆ H ₂₉ O ₁₆	Glycoside compound	Anti-oxidant Anti-inflammatory Anti-microbial ^[68]	+
82	29.7	5,6-Dihydroxy-5,6-dihydro-lutein	C ₄₀ H ₅₈ O ₄	Lutein	Anti-oxidant ^[69]	+
83	35.52	Chrysanthemaxanthin	C ₄₀ H ₅₆ O ₃	Natural carotenoid	Anti-oxidant Anti-microbial ^[70]	+ +
84	7.65	Reticuline	C ₂₁ H ₂₂ NO ₄	Alkaloid	Anti-oxidant ^[71]	+
85	2.8	Protocatechuic acid	C ₇ H ₆ O ₄	Phenolic acid	Anti-oxidant Anti-microbial Neuroprotective Cardioprotective ^[72]	+
86	6.33	Delphinidin 3-O-glucosyl-5-O-caffeoylglucoside	C ₃₆ H ₃₆ O ₂₀	Glycoside compound	Anti-cancer Anti-oxidant ^[73]	+
87	6.58	Pinoresinol-4-O-β-D-xylopyranoside	C ₂₅ H ₃₀ O ₁₀	Other	Anti-oxidant Anti-microbial Anti-cancer ^[74]	+ +

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