

Table S1. Phytochemicals identified in the lungworts.

S r . N o.	Compound	Class	Amount	Part of plant used	Reference
1	7-Tigloyl-or 7-Seneciolyretronecine	Pyrrolizidine alkaloids (PA)	2 ^a	Dried root and rhizome of <i>P. obscura</i> (D RR)	[1]
2	2-O-(E)-caffeoyl-D-glyceric acid	Poly phenolic acid (PPA)	5.10±0.14 (µg/mg)	Methanolic extract from the aerial part (MEAP) of <i>P. officinalis</i>	[2]
			1.24±0.02 (µg/mg)	MEAP of <i>P. obscura</i>	
3	2-O-(E)-caffeoyl-L-threonic acid	PPA	4.52±0.14 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			3.34±0.11 (µg/mg)	MEAP of <i>P. obscura</i>	
4	3-O-(E)-caffeoyl-glyceric acid	PPA	2.08±0.06 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			Traces	MEAP of <i>P. obscura</i>	
5	3-O-(E)-caffeoyl-threonic acid	PPA	1.53±0.05 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			1.18±0.10 (µg/mg)	MEAP of <i>P. obscura</i>	
6	3-O-p-coumaroylquinic acid	Others	2.29±0.04 (µg/mg)	MEAP of <i>P. officinalis</i> and	[2]
			0.87±0.03 (µg/mg)	MEAP of <i>P. obscura</i>	
7	3'-O-(E)-feruloyl- α -sorbopyranosyl-(2'1)- α -glucopyranoside	PPA	0.45±0.01 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			Traces	MEAP of <i>P. obscura</i>	
8	4-O-(E)-caffeoyl-L-threonic acid	PPA	2.78±0.07 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			1.50±0.08 (µg/mg)	MEAP of <i>P. obscura</i>	

9	4-O-p-coumaroylquinic acid	Others	13.9±0.8 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			Traces	MEAP of <i>P. obscura</i>	
10	5-O-p-coumaroylquinic acid	Others	1.88±0.04 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			0.93±0.04 (µg/mg)	MEAP of <i>P. obscura</i>	
11	7- Isobutyryllycopsamine	PA	15 ^a	DRR	[1]
12	7- Tigloylintermedine	PA	100 ^a	DRR	[1]
13	7- Tigloyllycopsamine (Symphytine)	PA	85 ^a	DRR	[1]
14	7-(2-Methylbutyryl)- lycopsamine	PA	8 ^a	DRR	[1]
15	7-(2-Methylbutyryl)-intermedine,	PA	5 ^a	DRR	[1]
16	7-(3-Methylbutyryl)- lycopsamine,	PA	4 ^a	DRR	[1]
17	7-(3-Methylbutyryl)-intermedine	PA	3 ^a	DRR	[1]
18	7-Acetyl-9-(RI=1833)-monoester	PA	5 ^a	DRR	[1]
19	7-Acetylintermedine	PA	80 ^a	DRR	[1]
20	7-Acetyllycopsamine,	PA	100 ^a	DRR	[1]
21	7-Isobutyrylintermedine	PA	20 ^a	DRR	[1]
22	7-Propionylintermedine	PA	15 ^a	DRR	[1]
23	7-Propionyllycopsamine	PA	10 ^a	DRR	[1]
24	7-Senecioylintermedine	PA	20 ^a	DRR	[1]
25	7-Senecioyllycopsamine	PA	15 ^a	DRR	[1]
26	9-Monoester	PA	4 ^a	DRR	[1]
27	Acacetin	Flavanone	NA	Methanolic extract of leaves of <i>P. officinalis</i>	[4]
28	Actinidioionoside	Lignan	26.1±6.8 (µg/mg)	MEAP of <i>P. officinalis</i> and	[2]
			Traces	MEAP of <i>P. obscura</i>	
29	Allantoin	Others	1.04 ± 0.22 mg g ⁻¹ air-dry matter	Methanolic extract of shoot (MES) from <i>P. mollis</i>	[5]
			9.75 ± 0.25 mg g ⁻¹ air-dry matter	Methanolic extract of root (MER) from <i>P. mollis</i>	

			2.37 ± 0.37 mg g ⁻¹ air-dry matter	MES from <i>P. obscura</i>	
			13.14 ± 3.74 mg g ⁻¹ air-dry matter	MER from <i>P. obscura</i>	
30	Apigenin	Flavones	18 ^b	Root leaves of <i>P. mollis</i>	[6]
		Flavones	NA	Ethanolic extract <i>P. officinalis</i> (EEPO)	[7]
31	apigenin 7-glucoside,	Flavones	NA	Methanolic extract of leaves of <i>P. officinalis</i>	[4]
32	Astragalin	Flavonoid	146.6±3.2 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			Traces	MEAP of <i>P. obscura</i>	
33	Caffeic acid	PPA	2.31± 0.11 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			Traces	MEAP of <i>P. obscura</i>	
			3.94 ^b	Floriferous shoots of <i>P. mollis</i>	[6]
			12.94 (µg/ml) in aqueous extract	AEPO	[7]
			3.36 (µg/ml) in ethanol extract	EEPO	
34	Catechin	Others	2.22 ^b	in floriferous shoots	[6]
			1.8 ^b	in root leaves	
35	Chlorogenic acid	PPA	4.32± 0.11 (µg/mg)	MEAP of <i>P. officinalis</i> and	[3]

			4.87±0.13 (µg/mg)	MEAP of <i>P. obscura</i>	
			NA	Methanolic extract of leaves of <i>P. officinalis</i>	[4]
			3.75 ^b	in floriferous shoots	[6]
			0.94 ^b	in root leaves	
			3.53 (µg/ml) in aqueous extract	AEPO	[7]
			3.03 (µg/ml) in ethanol extract	EEPO	
36	Cichoric acid	PPA	3.4 ^b	in root leaves	[6]
37	Cryptochlorogenic acid	PPA	0.22±0.01 (µg/mg)	MEAP of <i>P. officinalis</i> and	[2]
			0.74±0.03 (µg/mg)	MEAP of <i>P. obscura</i>	
38	Danshensu	PPA	1.52±0.06 (µg/mg)	MEAP of <i>P. officinalis</i> and	[3] [2]
			2.40±0.10 (µg/mg)	MEAP of <i>P. obscura</i>	
39	Dihydroquercetin	Flavanols	8.11 ^b	floriferous shoots	[6]
40	Ferulic acid	Hydroxycinnamic acid	22.5 ^b	floriferous shoots	[6]
			NA	AEPO	[7]
41	Gallic acid	Phenolic acid	NA	Methanolic extract of leaves of <i>P. officinalis</i>	[4]
			20.6 ^b in floriferous shoots	Floriferous shoot of <i>P. mollis</i>	[6]

			24.23 ^b in root leaves	root leaves of <i>P. mollis</i>	
			0.97 (µg/ml) in aqueous extract	AEPO	[7]
42	Globoidnan A	Lignan	0.57-0.02 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			4.10-0.17 (µg/mg)	MEAP of <i>P. obscura</i>	
43	Globoidnan B	Lignan	24.16±3.33 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			29.79±4.46 (µg/mg)	MEAP of <i>P. obscura</i>	
44	hesperetin,	Flavanone	NA	Methanolic extract of leaves of <i>P. officinalis</i>	[4]
45	hesperidin	Flavanone	NA	Methanolic extract of leaves of <i>P. officinalis</i>	[4]
46	Hyperoside	Flavonoid	NA	Methanolic extract of leaves of <i>P. officinalis</i>	[4]
		flavonoid	0.54 (µg/ml) in aqueous extract	AEPO	[7]
			3.97 (µg/ml) in ethanol extract	EEPO	
47	Intermedine	PA	90 ^a	DRR	[1]
48	Isorhamnetin 315	flavonols	NA	EEPO	[7]
49	Isosalvianolic acid A	PPA	0.7±0.1 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			Traces	MEAP of <i>P. obscura</i>	
50	Isosalvianolic acid A-1	PPA	Traces	MEAP of <i>P. officinalis</i>	[3]

			Traces	MEAP of <i>P. obscura</i>	
51	Isosalvianolic acid A isomer	PPA	1.8±0.3 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			Traces	MEAP of <i>P. obscura</i>	
52	Kaempferol	Flavonols	1,46 ^b	floriferous shoots	[6]
		Flavonols	NA	AEPO	[7]
			NA	EEPO	
53	Kaempferol 3-O-(6-O-malonyl)- <i>b</i> -glucoside	Flavonols	731.6±45.5 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			0.40±0.08 (µg/mg)	MEAP of <i>P. obscura</i>	
54	kaempferol 3-O-glucoside	Flavonoid	NA	MEAP of <i>P. officinalis</i>	[8]
55	kaempferol aglycones	flavonoids	NA	MEAP of <i>P. officinalis</i>	[8]
56	Lithospermic acid A	PPA	44.20± 0.05 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			80.13±6.44 (µg/mg)	MEAP of <i>P. obscura</i>	
57	Luteolin	Flavones	NA	EEPO	[7]
58	Luteolin 7- glucoside	Flavones	1.16 ^b	in root leaves	[6]

59	Lycoperodine-1	Others	1.20±0.04 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			Traces	MEAP of <i>P. obscura</i>	
60	Lycopsamine,	PA	100 ^a	DRR	[1]
61	Menisdaurin	Others	39.08±1.56 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			16.36±0.43 (µg/mg)	MEAP of <i>P. obscura</i>	
62	Monardic acid A	PPA	17.56±2.77 (µg/mg)	MEAP of <i>P. officinalis</i> and	[2]
			42.99±5.04 (µg/mg)	MEAP of <i>P. obscura</i>	
63	myricetin	Flavonoid	NA	Methanolic extract of leaves of <i>P. officinalis</i>	[4]
64	naringenin,	Flavanone	NA	Methanolic extract of leaves of <i>P. officinalis</i>	[4]
65	Neochlorogenic acid	PPA	0.04±0.00 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			0.37±0.01 (µg/mg)	MEAP of <i>P. obscura</i>	
			2.58 ^b	floriferous shoots	[6]
			2.97 ^b	root leaves	
66	Nicotiflorin	Flavonols	184.8±4.5 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			Traces	MEAP of <i>P. obscura</i>	
67	Nicotiflorin isomer	Flavonols	3.1±0.3 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			Traces	MEAP of <i>P. obscura</i>	
68	p-Coumaric acid 163	Hydroxycinnamic acid	0.46 (µg/ml)	AEPO	[7]

69	p-hydroxybenzoic acid	Phenolic acid	Shoot = nd	MES from <i>P. mollis</i>	[5]
			Root = nd	MER from <i>P. mollis</i>	
			0.173 ± 0.003 mg g ⁻¹ air-dry matter	MES from <i>P. obscura</i>	
			Root = nd	MER from <i>P. obscura</i>	
70	Pulmitric acid A	PPA	Traces	MEAP of <i>P. officinalis</i>	[2]
			Traces	MEAP of <i>P. obscura</i>	
71	Pulmitric acid B	PPA	Traces	MEAP of <i>P. officinalis</i>	[3]
			Traces	MEAP of <i>P. obscura</i>	
72	Pulmonarioside A		18.0±1.5 (µg/mg) (<i>P. officinalis</i>)	MEAP of <i>P. officinalis</i>	[3]
			Traces	MEAP of <i>P. obscura</i>	
73	Pulmonarioside B		147.5±12.8 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			0.50-0.03 (µg/mg)	MEAP of <i>P. obscura</i>	
74	Quercetin 3-O-glucoside	Flavonols	NA	MEAP of <i>P. officinalis</i>	[8]
75	Quercetin 3-O-rhamnoglucoside	Flavonols	NA	MEAP of <i>P. officinalis</i>	[8]
76	Quercetin 3-O-(6''-O-malonyl)-β-glucoside	Flavonols	2.82±0.15 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			4.10±0.18 (µg/mg)	MEAP of <i>P. obscura</i>	
77	Quercetin 3-O-rhamnoside	Flavonols			[8]
78	Quercetin 3-O-β-glucoside	Flavonols	0.33± 0.02 (µg/mg)	MEAP of <i>P. officinalis</i> and	[2]

			0.62±0.01 (µg/mg)	MEAP of <i>P. obscura</i>	
79	Quercetin	Flavonols	NA	EEPO	[7]
80	Kaempferol aglycones	flavonoids	NA	MEAP of <i>P. officinalis</i>	[8]
81	Rosmarinic acid	PPA	159.28±17.09(µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			301.46±35.04 (µg/mg)	MEAP of <i>P. obscura</i>	
			36.6 ± 1.2 mg g ⁻¹ air-dry matter	MES from <i>P. mollis</i>	[5]
			7.5 ± 0.24 mg g ⁻¹ air-dry matter	MER from <i>P. mollis</i>	
			15.6 ± 2.0 mg g ⁻¹ air-dry matter	MES from <i>P. obscura</i>	
			7.9 ± 0.38 mg g ⁻¹ air-dry matter	MER from <i>P. obscura</i>	
			63.05 ±1.12 µg/mg of d.w	MEAP of <i>P. officinalis</i>	[9]
			71.54 ± 9.12 µg/mg of d.w	MEAP of <i>P. obscura</i>	
			41.94 (µg/ml) in aqueous extract	AEPO	[7]
			124.59 (µg/ml) in ethanol extract	EEPO	
82	Rosmarinic acid methyl ester s	Polyphenol	15.8±1.4(µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			Traces	MEAP of <i>P. obscura</i>	

83	Rutin	Flavanols	369.9±9.4 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			Traces	MEAP of <i>P. obscura</i>	
			NA	Methanolic extract of leaves of <i>P. officinalis</i>	[4]
			0.20 (µg/ml) in aqueous extract	AEPO	[7]
			8.76 (µg/ml) in ethanol extract	EEPO	
84	Salvianolic acid H	PPA	26.23±0.75 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			8.97±0.82 (µg/mg)	MEAP of <i>P. obscura</i>	
85	Salvianolic acid H-9''-methylester	PPA	0.79±0.02 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			3.87±0.11 (µg/mg)	MEAP of <i>P. obscura</i>	
86	Shimobashiric acid C	PPA	5.46± 0.17 (µg/mg)	MEAP of <i>P. officinalis</i>	[3]
			7.46±0.17 (µg/mg)	MEAP of <i>P. obscura</i>	
87	Trachelanthamidine	PA	2 ^a	DRR	[1]
88	Trachelanthamidine/Isoretronecanol-ester	PA	9 ^a	DRR	[1]
89	Vicenin	Flavonoid	1.79 ^b	in root leaves	[6]
90	Yunnaneic acid B	PPA	22.65- 1.49 (µg/mg)	MEAP of <i>P. officinalis</i>	[2]
			23.65-0.52 (µg/mg)	MEAP of <i>P. obscura</i>	

			1.94 ± 0.07 µg/m g of d.w (<i>P. officinalis</i>)	MEAP of <i>P. officinalis</i>	[9]
			3.35 ± 0.82 µg/m g of d.w	MEAP of <i>P. obscura</i>	
91	Yunnaneic acid E	PPA	12.07±0.33 (µg/m g)	MEAP of <i>P. officinalis</i>	[3]
			27.32±0.23 (µg/m g)	MEAP of <i>P. obscura</i>	
92	Yunnaneic acid E-1	PPA	Traces (<i>P. officinalis</i>)	MEAP of <i>P. officinalis</i>	[3]
			Traces (<i>P. obscura</i>)	MEAP of <i>P. obscura</i>	

^a Numbers indicate the percentage abundance relative to the highest peak per sample.

^b Relative amount in percent.

References

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