

Supplementary Table S13. Expression values (FPKM) of sequences from the four gene families in Ranunculales.

Species	NCS	CNMT	NMCH	OMT
<i>Nandina domestica</i>	11.98	5.72	23.69	1.54
<i>Meconopsis quintuplinervia</i>	36.44	8.2	0.76	14.98
<i>Stephania japonica</i>	35.61	649.87	166.56	316.16
<i>Cocculus orbiculatus</i>	164.08	156.75	105.7	179.33
<i>Clematis subumbellata</i>	40.8	23.81	0	0
<i>Thalictrum shensiense</i>	24.93	0.76	0.17	0.53
<i>Kingdonia uniflora</i>	19.8	13.38	3.32	0
<i>Berberis amurensis</i>	19.34	1.26	11.95	5.51
<i>Epimedium chlorandrum</i>	0	42.89	2.64	10.4
<i>Callianthemum alatavicum</i>	2.89	8.99	0	0
<i>Mahonia retinervis</i>	5305.95	447.18	246.14	262.12
<i>Clematis apiifolia</i>	1658.58	24.95	0	0
<i>Gymnospermium kiangnanense</i>	177.15	30.94	10.76	27.92
<i>Stauntonia yaoshanensis</i>	23.25	0	0	0
<i>Berberis silvicola</i>	228.5	76.47	9.12	14.28
<i>Diploclisia glaucescens</i>	1.86	2.05	10.13	0.83
<i>Anemoclema glaucifolium</i>	10.78	2.34	0	0
<i>Sinopodophyllum hexandrum</i>	7.19	5.28	0	0
<i>Berberis poiretii</i>	18.52	3.51	3.32	4.26
<i>Thalictrum foetidum</i>	13.17	5.38	0	0.72
<i>Decaisnea insignis</i>	8.25	3.71	0	0
<i>Urophysa rockii</i>	21.01	33.74	0	4.79
<i>Callianthemum taipaicum</i>	1.67	0	0	0
<i>Batrachium bungei</i>	7.28	1.73	1.68	0
<i>Berberis soulieana</i>	140.79	60.13	132.71	3.02
<i>Pulsatilla vulgaris</i>	3	20.58	0	0
<i>Halerpestes cymbalaria</i>	223.11	25.45	0	0
<i>Akebia trifoliata</i>	150.41	0	0	10.86
<i>Trollius japonicus</i>	4.32	6.62	0.25	0
<i>Aquilegia ecalcarata</i>	8	0.3	0.15	2.09
<i>Dysosma pleiantha</i>	24.6	5.35	0	0
<i>Mahonia fortunei</i>	632.53	202.09	190.74	12.97
<i>Aconitum sinomontanum</i>	50.02	7.5	1.63	25.13
<i>Clematis brevicaudata</i>	1043.89	0	0	6.55
<i>Berberis julianae</i>	0	43.99	49.9	14.93
<i>Berberis virgetorum</i>	614.82	386.31	70.69	37.1
<i>Epimedium lishihchenii</i>	84.48	23.85	5.88	36.63
<i>Berberis atrocarpa</i>	5.37	66.85	33.77	2.96
<i>Epimedium dolichostemon</i>	4.95	58.74	16.08	3.3
<i>Stauntonia obovatifoliola subsp. Un</i>	139.86	1.76	0	0
<i>Clematis lanuginosa</i>	1.25	20.36	0	0
<i>Clematis heracleifolia</i>	583.1	3.45	0	1.09
<i>Macleaya microcarpa</i>	10.95	9.25	4.83	21.53
<i>Epimedium brevicornu</i>	14.16	18.73	1.29	9.09
<i>Eleutharrhena macrocarpa</i>	15.19	57.57	0	0.88
<i>Thalictrum nepalense</i>	71.68	7.16	2.38	15.26
<i>Menispermum canadense</i>	14.45	0	7.78	215.97
<i>Pulsatilla cernua</i>	47.47	12.27	0	3.78
<i>Anemone begoniifolia</i>	22.58	3.84	0	0
<i>Ranunculus caucasicus</i>	44.86	1.12	0	0
<i>Menispermum dauricum</i>	55.67	61.13	5.78	53.97
<i>Aconitum crassiflorum</i>	1.79	10.19	0	6.2
<i>Epimedium fargesii</i>	13	67.9	2.97	36.7
<i>Helleborus torquatus</i>	0.47	2.34	0	0

Dichocarpum dalzielii	199.92	17.85	4.93	18.5
Dysosma aurantiocaulis	2.43	0	0	0
Thalictrum uncatum	55.12	4.56	0	0.46
Berberis ziyunensis	93.13	24.58	34.98	0
Actaea mairei	1.82	0	1.8	0
Aconitum coreanum	121.03	147.59	10.41	71.81
Vancouveria hexandra	0	5.22	0	0
Clematis henryi	567.83	7.9	0	0
Clematis songorica	262.31	19.37	0.39	0
Berberis thunbergii Atropurpurea	0	0	0	0
Cimicifuga japonica	114.85	32.39	21.53	0
Anemone patens	0.65	12.91	0	0.23
Nandina domestica var.leucocarpa	150.78	33.23	117.4	16.42
Berberis ferdinandi-coburgii	9.12	0.26	73.68	0.91
Corydalis linarioides	3.57	3.33	2.07	10.55
Stauntonia chinensis	3.35	16.85	0	0
Stylophorum sutchuenense	41.12	105.76	6.62	8.28
Epimedium baojingense	4.34	3.79	0	6.55
Berberis koreana	27.28	1.43	4.13	0.04
Hylomecon japonica	41.13	19.84	5.67	47.7
Akebia trifoliata subsp.australis	20.69	41.95	0	0
Mahonia sheridaniana	525.2	91.11	173.17	27.08
Pulsatilla chinensis	123.65	34.07	0	0
Aconitum pilopetalum	11.27	13.23	0.54	9.72
Thalictrum bouffordii	77.04	3.95	1.82	31.06
Mahonia decipiens	606.51	128.08	182.3	80.89
Tinospora sagittata	41.05	21.33	0	0
Meconopsis oliveriana	9.94	10.55	0.18	8.32
Epimedium boreali-guizhouense	33.91	23.22	2.11	16.2
Stephania cephalantha	6.19	24.65	14.46	1.21
Aconitum scaposum	3.43	1.16	0.14	2.04
Mahonia napaulensis	1338.08	174.53	144.58	163.76
Clematis puberula var.ganpiniana	579.46	5.21	0	21.48
Diphylleia sinensis	86.2	2.62	0	1.94
Caltha palustris	83.36	26.32	13.03	10.56
Berberis cavaleriei	116.26	48.73	7.79	3.99
Epimedium davidii	32.37	31.22	3.65	22.62
Paeonia anomala subsp.veitchii	205.19	4.17	0	0
Circaeaster agrestis	5.12	0	0	0
Actaea vaginata	6.34	1.58	0	0
Ranunculus ternatus	3.28	5.52	0	0
Aconitum barbatum var.puberulum	8.14	2.98	0.07	4.48
Aconitum kusnezoffii	47.01	19.93	3.79	9.63
Berberis liophylla	162.98	77.14	54.18	27.78
Cyclea racemosa	328.15	46.7	1.27	97.73
Clematis urophylla	11.9	9.07	0	0.35
Diphylleia cymosa	1.01	3.3	0	0
Corydalis sheareri	55.6	45.17	8.29	24.7
Epimedium leptorrhizum	6.57	57.74	1.44	13.63
Berberis feddeana	29.33	30.55	2.48	19.58
Dysosma versipellis	4.64	1.66	0	1.15
Mahonia breviracema	80.37	21.62	1.74	2.93
Epimedium simplicifolium	10.6	9.25	28.3	32.8
Diphylleia grayi	37.36	0	1.84	3.77
Dendromecon rigida	31	1.35	1.03	10.38
Mahonia fordii	313.41	99.79	408.34	21.07
Corydalis pseudotongolensis	4	25.15	2.53	19.06
Aconitum finetianum	13.58	1.01	0.94	1.67

Mahonia polyodonta	78.52	116.36	62.93	225.34
Caltha scaposa	56.75	14.18	22.94	6.25
Dicranostigma leptopodum	148.26	28.67	1.32	42.79
Ranunculus chinensis	82.18	0.28	0	0
Dysosma delavayi	67.16	0.63	0	0
Berberis thunbergii	150.83	217	149.41	203.41
Chelidonium majus	87.39	77.35	14.82	110.37
Helleborus atrorubens	3.93	1.76	0	0
Clematis apiifolia var.argentilucida	0	21.41	0	0.68
Thalictrum fortunei	23.7	16.73	0.41	19.88
Stauntonia brunoniana	11.31	9.42	0	0
Helleborus argutifolius	112	0.73	0	0
Adonis sibirica	79.8	63.9	18.19	29.2
Thalictrum cultratum	3.92	4.61	0.15	4.98
Berberis sublevis	39.34	77.25	67.49	10.24
Corydalis pseudosibirica	1.39	2.43	0.78	9.63
Thalictrum delavayi	19.18	6.45	0.41	4.64
Corydalis speciosa	8.27	12.25	0.2	5.11
Clematis parviloba	32.87	15.7	0	0
Tinospora sinensis	44.12	11.15	52.71	4.5
Tinospora sagittata var.craveniana	90.38	23.79	22.27	22.7
Clematis tinghuensis	43.57	20.14	0	0
Clematis kweichowensis	0.47	3.4	0	0.59
Epimedium acuminatum	0	29.38	1.22	4.3
Clematis tangutica	16.38	21.04	0	0.13
Clematis rehderiana	20.24	3.8	0	0.18
Berberis integripetala	254.13	61.36	64.58	64.65
Aquilegia yabeana	44.94	1.3	0.28	1
Stephania dielsiana	59.17	80.14	144.4	0.35
Clematis menglaensis	53.54	0	0	0
Mahonia bracteolata	296.45	42.09	20.01	79.41
Thalictrum przewalskii	245.82	40.31	6.51	100.84
Cocculus laurifolius	332.18	37.19	25.58	166.43
Corydalis curviflora	9.7	14.74	10.08	19.92
Fibraurea recisa	70.56	86.33	88.5	191.93
Mahonia subimbricata	1082.14	100.16	53.03	10.71
Mahonia shenii	1024.45	161.81	63.33	341.16
Diploclisia affinis	2.31	5.37	11.19	43.18
Holboellia coriacea	309.57	17.36	0	0
Berberis gagnepainii	66.38	137.26	42.96	2.99
Aconitum brunneum	63.65	7.54	0	1.54
Thalictrum faberi	156.5	1.3	0.39	6.74
Stephania tetrandra	0	233.72	46.45	134.46
Thalictrum fargesii	40.59	13.16	1.25	88.68
Clematis uncinata	1224.13	44.39	0	2.34
Cyclea polypetala	32.01	88.89	1.2	1.44
Aconitum pendulum	38.48	0.68	1.39	9.94
Helleborus thibetanus	3.43	1.37	0.14	0
Clematis manshurica	50.43	3.42	0	0.61
Coptis teeta	250.49	3.62	49.5	70.85
Stephania kwangsiensis	6.05	19.3	0	0
Meconopsis racemosa	81.05	1.96	0	2.81
Epimedium myrianthum	18.83	22.17	2.74	18.42
Stephania epigaea	308.56	46.41	8.42	14.63
Coptis chinensis	185.84	24.24	109.05	42.01
Arcangelisia gusanlung	46.33	316.82	61.36	188.16
Thalictrum minus	4.74	1.42	1.33	1.64
Thalictrum atriplex	7.43	3.67	1.77	8.73

Ranunculus tanguticus	51.71	1.01	0	0
Clematis chingii	297.4	24.34	0	0
Oxygraphis glacialis	4.58	0.78	0	0
Ranunculus japonicus	2.02	0.77	0	0
Mahonia eurybracteata subsp.ganji	47.54	117.52	81.21	20.52
Helleborus lividus	39.75	6.81	0.74	2.9
Aconitum monanthum	22.91	2.09	0	0
Berberis gyalaiica	48.6	5.98	3.67	6.53
Clematis hexapetala	4.09	0.84	0.99	0.04
Epimedium pseudowushanense	3.96	8.5	5.15	5.05
Epimedium sagittatum	10.68	39.62	23.6	8.09
Aconitum gymnandrum	40.61	13.31	8.43	17.14
Clematis peterae	79.3	18.85	44.85	0
Epimedium brachyrrhizum	18.71	42.52	11.59	13.12
Urophysa henryi	275.58	68.99	0	108.37
Clematis finetiana	24.88	15.1	0	0
Clematis lasiandra	31.7	7.48	0	0
Paraquilegia microphylla	33.73	4.6	0	10.86
Macleaya cordata	535.13	149.44	45.02	480.25
Akebia quinata	85.64	0	0	12.3
Caltha palustris var.barthei	2.47	3.98	1.52	1.43
Dysosma tsayuensis	3.33	1.24	0	0
Mahonia gracilipes	13.22	26.24	38.6	46.26
Mahonia bodinieri	56.65	18.13	5.17	280.4
Hepatica henryi	2.49	4.02	0	0
Thalictrum petaloideum	3.9	14.92	0.37	1.39
Berberis lempergiana	15.98	2.33	177.56	0.81
Clematis patens	5.94	24.56	61.49	0
Clematis shensiensis	30.51	5.13	0	0.17
Stephania longa	25.19	151.29	60.72	124.25
Asteropyrum peltatum	643.12	120.5	62.69	524.3
Stephania hainanensis	2.45	215.29	176.91	48.71
Thalictrum smithii	60.09	3.66	10.33	23.9
Clematis puberula var.tenuisepala	83.19	11.47	22.5	7.23
Euptelea pleiosperma	6.56	40.63	0	9.3
Aconitum carmichaelii	13.44	5.52	5.03	28.97
Mahonia bealei	292.97	88.98	0	0
Corydalis ophiocarpa	174.51	29.13	20.74	57.07
Berberis wilsoniae	10.69	14.91	8.04	44.89
Dicentra spectabilis	356.16	13.7	1.28	130.26
Ranunculus repens	417.5	12.69	0	0
Adonis sutchuenensis	23.29	20.12	1.23	5.01
Asteropyrum cavaleriei	5.14	7.32	7.71	31.15
Ranunculus sieboldii	144.07	1.41	0	0
Corydalis adunca	70.63	6.09	50.66	217.17
Thalictrum finetii	5.86	2.91	0.94	1.12
Berberis kunmingensis	15.82	62.21	33.97	2.02
Stylophorum lasiocarpum	92.19	45.6	15.79	50.35
Berberis zanlanscianensis	28.24	5.02	28.36	71.96
Thalictrum ramosum	193.31	28.55	34.92	265.87
Leptopyrum fumarioides	22.17	15.76	1.04	4.6
Berberis nummularia	112.57	8.58	1.85	0
Clematis aethusifolia	12.14	14.03	0	0
Mahonia oiwakensis	475.74	120.37	81.02	7.11
Anemone vitifolia	3.14	13.62	5.04	0
Corydalis edulis	45.72	116.25	7.57	16.31
Ranunculus petrogeiton	24.41	6.13	0	0
Coptis chinensis var.brevisepala	0.87	12.62	2.37	0

<i>Eomecon chionantha</i>	984.25	11.91	11.54	85.95
<i>Stauntonia leucantha</i>	0.63	0	0	6.99
<i>Epimedium ecalcaratum</i>	4.42	40.75	14.94	6.89
<i>Mahonia eurybracteata</i>	64.72	218.32	22.78	99.8
<i>Aconitum cannabifolium</i>	0.92	3.15	0	0.34
<i>Aconitum leucostomum</i> var. <i>hopeie</i>	29.33	11.16	5.78	0.33
<i>Coptis deltoidea</i>	41	10.42	6.19	79.07
<i>Clematis orientalis</i>	22.5	28.66	0	1.04
<i>Clematis fruticosa</i>	69.82	17.18	0	0
<i>Aquilegia rockii</i>	8	1.79	0	0
<i>Trollius ranunculoides</i>	175.63	223.72	5.03	52.28
<i>Berberis shensiana</i>	53.4	114.22	22.33	41.2
<i>Sinomenium acutum</i>	20.38	94.68	28.15	65.25
<i>Delphinium tatsienense</i>	9.08	24.14	0.44	4.81
<i>Clematis sibirica</i> var. <i>ochotensis</i>	23.86	2.6	6.85	0.37
<i>Papaver rhoeas</i>	73.19	55.63	0	0.91
<i>Epimedium epsteinii</i>	2.86	31.82	15.23	4.34
<i>Anemone tomentosa</i>	31.12	20.13	0	0
<i>Helleborus foetidus</i>	2.86	13.32	0	0
<i>Argemone mexicana</i>	0.71	11.69	0.37	4.69
<i>Holboellia grandiflora</i>	221.34	31.09	0	9.54
<i>Pericampylus glaucus</i>	23.22	33.55	35.67	118.37
<i>Thalictrum minus</i> var. <i>hypoleucum</i>	4.17	26.02	2.21	3.44
<i>Cyclea hypoglauca</i>	146.32	14.38	18.11	27.53
<i>Corydalis tomentella</i>	137.16	123.99	7.32	22.26
<i>Epimedium sagittatum</i> var. <i>glabratu</i>	0	36.31	11.64	0
<i>Epimedium stellulatum</i>	0	42.57	1.91	1.03
<i>Beesia calthifolia</i>	0	19.48	23.64	0
<i>Epimedium koreanum</i>	0	11.91	5.01	22.63
<i>Cimicifuga foetida</i> var. <i>foliolosa</i>	0	4.15	3.13	0