

Plastome structure and phylogenetic relationships of genus *Hydrocotyle* (Apiales): provide insights into the plastome evolution of *Hydrocotyle*

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Abstract:

Background The genus *Hydrocotyle* Tourn. ex L. is a key group for further study on the evolution of Apiales, comprising around 170 species globally. Previous studies mainly focused on separate sections and provided much information about this genus, but its infrageneric relationships are still confusing. In addition, the genetic basis of its adaptive evolution remains poorly understood. To investigate the phylogeny and evolution of the genus, we selected ten representative species covering two of three diversity distribution centers and exhibiting rich morphology diversity. Comparative plastome analysis was conducted to clarify the structural character of *Hydrocotyle* plastomes. Positive selection analyses were implemented to assess the evolution of the genus. Phylogenetic inferences with protein-coding sequences of *Hydrocotyle* and 17 related species were also performed.

Results Plastomes within *Hydrocotyle* were generally conservative in structure, gene order, and size. A total of 14 regions (*rps16-trnK*, *trnQ-rps16*, *atpI-atpH*, *trnC-petN-psbM*, *ycf3-trnS*, *accD-psaI-ycf4*, *petA-psbJ*, *rps12-rpl20*, *rpl16* intron, *rps3-rpl16* intron, *rps9-rpl22*, *ndhF-rpl32*, *ndhA* intron, and *ycf1a*) were recognized as hotspot regions within the genus, which suggested to be promising DNA barcodes for global phylogenetic analysis of *Hydrocotyle*. The *ycf15* gene was suggested to be a protein-coding gene for *Hydrocotyle* species, and it could be used as a DNA barcode to identify *Hydrocotyle*. In phylogenetic analysis, three monophyletic clades (Clade I, II, III) were identified with evidence of rapid radiation speciation within Clade I. The selective pressure analysis detected that six CDS genes (*ycf1b*, *matK*, *atpF*, *accD*, *rps14*, and *psbB*) of *Hydrocotyle* species were under positive selection. Within the genus, the last four genes were conservative, suggesting a relation to the unique evolution of the genus in Apiales. Seven genes (*atpE*, *matK*, *psbH*, *ycf1a*, *ycf1b*, *rpoA*, and *ycf2*) were detected to be under some degree of positive selection in different taxa within the genus *Hydrocotyle*, indicating their role in the adaptive evolution of species.

Conclusions Our study offers new insights into the phylogeny and adaptive evolution of *Hydrocotyle*. The plastome sequences could significantly enhance phylogenetic resolution and provide genomic resources and potential DNA markers useful for future studies of the genus.

Keywords: *Hydrocotyle*, Apiales, positive selection, adaptive evolution, phylogeny

Table S1. Voucher information for species newly sequenced in this study.

Species name	Collection number	Collector name	Locality	Latitude Longitude	Place of voucher deposition	deposition number	Determiner
<i>Hydrocotyle dielsiana</i>	Wj-20210901-01	Jun Wen	Guanmen Mountain, Shennongjia Forestry District; Hubei; China	N 31.442716° E 110.387546°	NAS	NAS00638767	Jun Wen
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	Wj-2021071403-06	Jun Wen	Yangjiajie; Zhangjiajie; Hunan; China	N 29.365066° E 110.434589°	NAS	NAS00638751	Jun Wen
<i>Hydrocotyle leucocephala</i>	Wj-20211206-01	You-Pai Zeng	South China Botanical Garden, Chinese Academy of Sciences; Guangdong; China	N 23.18794° E 113.373781°	NAS	NAS00638791	Jun Wen
<i>Hydrocotyle sibthorpioides</i>	Wj-2021071406-01	Jun Wen	Suoxiyu Nature Reserve; Zhangjiajie; Hunan; China	N 29.376384° E 110.49026°	NAS	NAS00638796	Jun Wen
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	Wj-20210830-01	Hui-Min Li	Qizimei Mountains; Hubei; China	N 30.029761° E 109.757311°	NAS	NAS00638784	Jun Wen
<i>Hydrocotyle verticillata</i>	Wj-2021072303-01	Jun Wen	Nanjing Botanical Garden Mem.Sun Yat-Sen; Jiangsu; China	N 32.055262° E 118.838222°	NAS	NAS00638788	Jun Wen

NAS: Herbarium, Institute of Botany, Chinese Academy of Sciences, Jiangsu Province

Table S2. Accession numbers for species derived from NCBI.

Species name	Family	accession number
<i>Aralia elata</i>	Araliaceae	KT153023
<i>Bupleurum chinense</i>	Apiaceae	MT561025
<i>Centella asiatica</i>	Apiaceae	MN854377
<i>Chamaesium spatuliferum</i>	Apiaceae	MN119371
<i>Dendropanax dentiger</i>	Araliaceae	NC_026546
<i>Dickinsia hydrocotyloides</i>	Apiaceae	MT423729
<i>Eleutherococcus senticosus</i>	Araliaceae	NC_016430
<i>Eryngium campestre</i>	Apiaceae	OK585059
<i>Fatsia japonica</i>	Araliaceae	NC_027685
<i>Hedera nepalensis</i> var. <i>sinensis</i>	Araliaceae	MK130890
<i>Panax ginseng</i>	Araliaceae	KF431956
<i>Panax japonicus</i> var. <i>bipinnatifidus</i>	Araliaceae	NC_043952
<i>Raukava edgerleyi</i>	Araliaceae	NC_049887
<i>Sanicula orthacantha</i> var. <i>stolonifera</i>	Apiaceae	MT561028
<i>Schefflera delavayi</i>	Araliaceae	NC_022813
<i>Torilis scabra</i>	Apiaceae	MT561029
<i>Torricellia angulata</i>	Torricelliaceae	NC_031509
<i>Torricellia tiliifolia</i>	Torricelliaceae	MK599408
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle</i>	MT561038
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle</i>	OK585058
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle</i>	NC_015818
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle</i>	NC_035502
<i>Heteromorpha arborescens</i>	Apiaceae	MT786054

Table S3. Distances among ten *Hydrocotyle* plastomes. The values represent the percentage of identical bases.

Taxa	<i>Hydrocotyle nepalensis</i> MT561038	<i>H. hookeri</i> subsp. <i>chinensis</i>	<i>H. dielsiana</i>	<i>H. pseudoconferta</i> OK585058	<i>H. sibthorpioides</i>	<i>H. sibthorpioides</i> _NC_035502	<i>H. sibthorpioides</i> var. <i>batrachium</i>	<i>H. leucocephala</i>	<i>H. verticillata</i>	<i>H. verticillata</i> _NC_015818
<i>H. nepalensis</i> MT561038		99.97	99.94	99.92	97.79	97.82	97.89	97.95	97.6	97.59
<i>H. hookeri</i> subsp. <i>chinensis</i>	99.97		99.95	99.93	97.8	97.82	97.89	97.95	97.61	97.6
<i>H. dielsiana</i>	99.94	99.95		99.95	97.82	97.85	97.92	97.99	97.64	97.63
<i>H. pseudoconferta</i> OK585058	99.92	99.93	99.95		97.82	97.85	97.89	97.97	97.62	97.61
<i>H. sibthorpioides</i>	97.79	97.8	97.82	97.82		99.95	98.82	96.8	96.53	96.49
<i>H. sibthorpioides</i> _NC_035502	97.82	97.82	97.85	97.85	99.95		98.85	96.83	96.56	96.52
<i>H. sibthorpioides</i> var. <i>batrachium</i>	97.89	97.89	97.92	97.89	98.82	98.85		96.91	96.6	96.6
<i>H. leucocephala</i>	97.95	97.95	97.99	97.97	96.8	96.83	96.91		98.18	98.14
<i>H. verticillata</i>	97.6	97.61	97.64	97.62	96.53	96.56	96.6	98.18		99.56
<i>H. verticillata</i> _NC_015818	97.59	97.6	97.63	97.61	96.49	96.52	96.6	98.14	99.56	

Table S4. Nucleotide diversity (Pi) of the *Hydrocotyle* plastome sequences under a slide window calculated in DnaSP v6. Regions with Pi> 0.017 were tagged with genetic information.

Window	Midpoint	Pi	Region
1-641	341	0.01094	
209-841	541	0.00515	
442-1041	741	0.00321	
642-1241	941	0.00267	
842-1441	1141	0.00121	
1042-1652	1341	0.00261	
1242-1854	1541	0.00533	
1442-2063	1754	0.01352	
1653-2263	1963	0.01345	
1855-2463	2163	0.01394	
2064-2663	2363	0.01164	
2264-2863	2563	0.01473	
2464-3063	2763	0.01436	
2664-3263	2963	0.01358	
2864-3463	3163	0.01167	
3064-3676	3363	0.01167	
3264-3876	3570	0.00936	
3464-4076	3776	0.00921	
3677-4294	3976	0.01036	
3877-4507	4176	0.01212	
4077-4707	4394	0.01585	
4295-4934	4607	0.02106	<i>trnK(UUU)-rps16</i>
4508-5134	4812	0.02058	<i>trnK(UUU)-rps16</i>
4708-5334	5034	0.01661	
4935-5548	5234	0.00867	
5135-5754	5439	0.00933	
5335-5965	5654	0.00982	
5549-6171	5854	0.01218	
5755-6371	6065	0.01103	
5966-6590	6271	0.01364	
6172-6918	6490	0.01424	
6372-7149	6799	0.01624	
6591-7383	7018	0.01376	
6919-7591	7271	0.01915	<i>trnQ(UUG)-rps16</i>
7150-7816	7491	0.01594	
7384-8016	7707	0.01321	
7592-8217	7916	0.00461	
7817-8439	8117	0.00533	
8017-8650	8335	0.00964	
8218-8852	8549	0.01255	
8440-9052	8752	0.01158	
8651-9261	8952	0.01194	
8853-9492	9159	0.01279	
9053-9692	9389	0.01364	
9262-9894	9592	0.01073	
100155-100754	100454	0.00073	
100355-100983	100654	0.00176	
100555-101183	100873	0.00133	
100755-101383	101083	0.00188	
10095-10760	10421	0.0097	
100984-101583	101283	0.00115	
101184-101783	101483	0.00085	
101384-101983	101683	0.00133	
101584-102183	101883	0.00158	
101784-102383	102083	0.00158	
101984-102583	102283	0.00085	
102184-102783	102483	0.0003	
102384-102983	102683	0.0003	
102584-103183	102883	0	
102784-103383	103083	0.0003	
10296-10960	10653	0.01552	
102984-103583	103283	0.0003	

103184-103783	103483	0.0003
103384-103983	103683	0
103584-104183	103883	0.00145
103784-104389	104083	0.00218
103984-104589	104289	0.00218
104184-104789	104489	0.00073
104390-104989	104689	0
104590-105189	104889	0.00073
104790-105389	105089	0.00103
104990-105589	105289	0.00103
105190-105789	105489	0.0003
10522-11160	10860	0.01285
105390-105989	105689	0
105590-106189	105889	0.0003
105790-106389	106089	0.00085
105990-106589	106289	0.00085
106190-106789	106489	0.00085
106390-106989	106689	0.0003
106590-107189	106889	0.0003
106790-107389	107089	0
106990-107589	107289	0
107190-107789	107489	0
107390-107989	107689	0.00085
107590-108189	107889	0.00085
10761-11360	11060	0.00994
107790-108389	108089	0.00085
107990-108589	108289	0
108190-108789	108489	0
108390-108989	108689	0
108590-109189	108889	0
108790-109389	109089	0.00103
108990-109617	109289	0.00103
109190-109817	109507	0.00158
109390-110017	109717	0.00315
10961-11560	11260	0.00339
109618-110218	109917	0.00388
109818-110418	110118	0.00424
110018-110618	110318	0.00236
110219-110818	110518	0.00164
110419-111018	110718	0.00145
110619-111218	110918	0.0023
110819-111418	111118	0.00303
111019-111618	111318	0.00261
111219-111818	111518	0.00248
111419-112021	111718	0.00636
11161-11760	11460	0.00424
111619-112221	111921	0.01164
111819-112421	112121	0.01285
112022-112621	112321	0.01491
112222-112821	112521	0.01048
112422-113021	112721	0.00994
112622-113221	112921	0.004
112822-113421	113121	0.00285
113022-113621	113321	0.00291
113222-113821	113521	0.00388
113422-114021	113721	0.00442
11361-11960	11660	0.00394
113622-114243	113921	0.00739
113822-114473	114124	0.013
114022-114789	114365	0.02094
114244-114999	114589	0.02564
114474-115220	114889	0.02418
114790-115435	115104	0.01873
115000-115637	115335	0.01415
115221-115900	115535	0.01394
115436-116175	115746	0.01618
11561-12160	11860	0.00442

ndhF-rpl32
ndhF-rpl32
ndhF-rpl32
ndhF-rpl32

115638-116376	116069	0.01691	
115901-116576	116276	0.01476	
116176-116776	116476	0.01148	
116377-116982	116676	0.00664	
116577-117182	116882	0.00533	
116777-117382	117082	0.00436	
116983-117583	117282	0.00594	
117183-117783	117482	0.00861	
117383-117983	117683	0.00891	
117584-118183	117883	0.00855	
11761-12360	12060	0.00564	
117784-118383	118083	0.00642	
117984-118583	118283	0.00582	
118184-118783	118483	0.00564	
118384-118983	118683	0.00509	
118584-119183	118883	0.00685	
118784-119385	119083	0.0083	
118984-119585	119283	0.00685	
119184-119785	119485	0.00539	
119386-119985	119685	0.00333	
119586-120185	119885	0.004	
11961-12560	12260	0.00588	
119786-120385	120085	0.00897	
119986-120585	120285	0.00915	
120186-120785	120485	0.00933	
120386-120997	120685	0.00564	
120586-121230	120885	0.00818	
120786-121449	121130	0.00952	
120998-121649	121349	0.00952	
121231-121851	121549	0.00879	
121450-122051	121749	0.01103	
12161-12760	12460	0.00982	
121650-122251	121951	0.01261	
121852-122451	122151	0.01139	
122052-122667	122351	0.01152	
122252-122871	122551	0.018	<i>ndhA intron</i>
122452-123077	122767	0.01988	<i>ndhA intron</i>
122668-123283	122977	0.01921	<i>ndhA intron</i>
122872-123490	123183	0.01224	
123078-123690	123390	0.01209	
123284-123890	123590	0.00821	
123491-124090	123790	0.00585	
12361-12976	12660	0.0083	
123691-124290	123990	0.0023	
123891-124490	124190	0.00394	
124091-124690	124390	0.00412	
124291-124890	124590	0.00594	
124491-125090	124790	0.00533	
124691-125290	124990	0.0077	
124891-125498	125190	0.01036	
125091-125704	125398	0.01115	
125291-125927	125598	0.01327	
125499-126160	125818	0.01255	
12561-13185	12876	0.01067	
125705-126360	126060	0.01812	<i>ycfI-rps15</i>
125928-126560	126260	0.01709	<i>ycfI-rps15</i>
126161-126760	126460	0.01752	<i>ycfI</i>
126361-126966	126660	0.01485	
126561-127184	126866	0.01552	
126761-127384	127084	0.01588	
126967-127584	127284	0.01842	<i>ycfI</i>
127185-127784	127484	0.02024	<i>ycfI</i>
127385-127984	127684	0.02103	<i>ycfI</i>
127585-128184	127884	0.01867	<i>ycfI</i>
12761-13385	13085	0.00733	
127785-128384	128084	0.01545	
127985-128584	128284	0.01958	<i>ycfI</i>

128185-128793	128484	0.02006	<i>ycfI</i>
128385-128993	128684	0.02224	<i>ycfI</i>
128585-129193	128893	0.01661	
128794-129393	129093	0.01742	<i>ycfI</i>
128994-129593	129293	0.01679	
129194-129793	129493	0.01442	
129394-130050	129693	0.01506	
129594-130250	129914	0.0147	
12977-13585	13285	0.00661	
129794-130450	130150	0.01809	<i>trnD(GUC)-psbM</i>
130051-130650	130350	0.0147	
130251-130883	130550	0.02485	<i>ycfI</i>
130451-131083	130783	0.02018	<i>ycfI</i>
130651-131283	130983	0.0163	
130884-131483	131183	0.00248	
131084-131683	131383	0.00261	
131284-131883	131583	0.00303	
131484-132083	131783	0.00158	
131684-132283	131983	0.00236	
13186-13803	13485	0.01097	
131884-132483	132183	0.00164	
132084-132684	132383	0.00267	
132284-132884	132584	0.00388	
132484-133084	132784	0.00388	
132685-133312	132984	0.00285	
132885-133512	133212	0.00103	
133085-133712	133412	0.00103	
133313-133912	133612	0.00103	
133513-134112	133812	0	
133713-134312	134012	0	
13386-14003	13689	0.01515	
133913-134512	134212	0	
134113-134712	134412	0	
134313-134912	134612	0.00085	
134513-135112	134812	0.00085	
134713-135312	135012	0.00085	
134913-135512	135212	0	
135113-135712	135412	0	
135313-135912	135612	0	
135513-136112	135812	0.0003	
135713-136312	136012	0.0003	
13586-14203	13903	0.01558	
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136513-137112	136812	0.0003	
136713-137312	137012	0	
136913-137512	137212	0.0003	
137113-137712	137412	0.00103	
137313-137912	137612	0.00103	
137513-138112	137812	0.00073	
137713-138312	138012	0.00073	
137913-138518	138212	0.00073	
13804-14403	14103	0.01127	
138113-138718	138412	0.00218	
138313-138918	138618	0.00145	
138519-139118	138818	0.00145	
138719-139318	139018	0	
138919-139518	139218	0.0003	
139119-139718	139418	0.0003	
139319-139918	139618	0.0003	
139519-140118	139818	0	
139719-140318	140018	0.0003	
139919-140518	140218	0.0003	
14004-14618	14303	0.00709	
140119-140718	140418	0.00115	
140319-140918	140618	0.00158	

140519-141118	140818	0.00158
140719-141318	141018	0.00103
140919-141518	141218	0.00085
141119-141728	141418	0.00115
141319-141947	141618	0.00188
141519-142147	141828	0.00133
141729-142347	142047	0.00176
141948-142547	142247	0.00073
14204-14821	14514	0.01279
142148-142747	142447	0.00073
142348-142947	142647	0
142548-143147	142847	0.0003
142748-143347	143047	0.0003
142948-143547	143247	0.0003
143148-143747	143447	0.00073
143348-143947	143647	0.00382
143548-144147	143847	0.00382
143748-144347	144047	0.004
143948-144547	144247	0.00091
14404-15043	14721	0.01552
144148-144747	144447	0.00145
144348-144947	144647	0.00085
144548-145147	144847	0.00115
144748-145347	145047	0.00061
144948-145547	145247	0.0003
145148-145747	145447	0
145348-145947	145647	0
145548-146147	145847	0
145748-146371	146047	0.00121
145948-146571	146247	0.00121
146148-146771	146471	0.00194
14619-15254	14943	0.01788
146372-146976	146671	0.00648
146572-147176	146876	0.00709
146772-147376	147076	0.00667
146977-147576	147276	0.00091
147177-147776	147476	0.0003
147377-147976	147676	0
147577-148182	147876	0
147777-148382	148076	0.00127
147977-148582	148282	0.00127
148183-148782	148482	0.00333
14822-15454	15147	0.01509
148383-148982	148682	0.00206
148583-149182	148882	0.00309
148783-149400	149082	0.00176
148983-149600	149300	0.00176
149183-149800	149500	0.00145
149401-150000	149700	0.00145
149601-150200	149900	0.00461
149801-150400	150100	0.00533
150001-150600	150300	0.00636
150201-150800	150500	0.00406
150401-151000	150700	0.00321
15044-15654	15354	0.0103
150601-151200	150900	0.002
150801-151400	151100	0.00115
151001-151600	151300	0.00055
151201-151800	151500	0.00206
151401-152000	151700	0.00333
151601-152200	151900	0.00333
151801-152400	152100	0.00345
152001-152600	152300	0.00309
152201-152800	152500	0.00339
152401-153000	152700	0.00339
15255-15854	15554	0.00758
152601-153200	152900	0.00321

atpI-atpH

152801-153400	153100	0.00467
153001-153600	153300	0.00248
153201-153800	153500	0.00176
153401-154000	153700	0
153601-154200	153900	0.0003
153801-154400	154100	0.0003
154001-154600	154300	0.00103
154201-154800	154500	0.00073
154401-155000	154700	0.00127
15455-16054	15754	0.00588
154601-155200	154900	0.00055
154801-155400	155100	0.00164
155001-155600	155300	0.00109
155201-155800	155500	0.00109
155401-155991	155694	0.00192
15655-16255	15954	0.0077
15855-16460	16155	0.00818
16055-16660	16360	0.00582
16256-16860	16560	0.00315
16461-17060	16760	0.00376
16661-17262	16960	0.00885
16861-17465	17162	0.01085
17061-17665	17365	0.00818
17263-17865	17565	0.0043
17466-18065	17765	0.00248
17666-18265	17965	0.00333
17866-18465	18165	0.00297
18066-18665	18365	0.00273
18266-18865	18565	0.00491
18466-19065	18765	0.006
18666-19265	18965	0.0077
18866-19465	19165	0.00715
19066-19665	19365	0.00624
19266-19865	19565	0.00718
19466-20065	19765	0.00773
19666-20265	19965	0.00809
19866-20465	20165	0.00867
20066-20665	20365	0.00752
20266-20865	20565	0.00897
20466-21065	20765	0.00473
20666-21265	20965	0.00315
20866-21465	21165	0.00145
21066-21670	21365	0.00727
21266-21873	21565	0.0083
21466-22073	21773	0.00945
21671-22273	21973	0.00479
21874-22473	22173	0.00739
22074-22673	22373	0.00636
22274-22873	22573	0.00721
22474-23073	22773	0.00461
22674-23273	22973	0.00436
22874-23478	23173	0.00436
23074-23700	23375	0.00748
23274-23913	23592	0.00948
23479-24113	23805	0.01179
23701-24313	24013	0.00897
23914-24513	24213	0.00594
24114-24713	24413	0.00255
24314-24913	24613	0.00224
24514-25113	24813	0.004
24714-25313	25013	0.00491
24914-25513	25213	0.0057
25114-25713	25413	0.00448
25314-25913	25613	0.0043
25514-26113	25813	0.00321
25714-26313	26013	0.00424
25914-26513	26213	0.00406

26114-26713	26413	0.00358
26314-26913	26613	0.00327
26514-27113	26813	0.00412
26714-27313	27013	0.00388
26914-27513	27213	0.00345
27114-27713	27413	0.002
27314-27913	27613	0.00315
27514-28128	27813	0.00818
27714-28343	28022	0.0097
27914-28550	28228	0.014
28129-28774	28449	0.01509
28344-28998	28674	0.0177
28551-29227	28880	0.01812
28775-29427	29127	0.01442
28999-29642	29327	0.01855
29228-30137	29536	0.02182
29428-30372	30015	0.02
29643-30604	30248	0.01521
30138-30804	30489	0.00576
30373-31004	30704	0.00752
30605-31227	30904	0.01045
30805-31449	31104	0.01633
31005-31658	31348	0.01809
31228-31876	31558	0.01394
31450-32076	31776	0.01042
31659-32276	31976	0.008
31877-32481	32176	0.00709
32077-32727	32376	0.01103
32277-32983	32627	0.01358
32482-33185	32869	0.01388
32728-33385	33083	0.00933
32984-33585	33285	0.0097
33186-33820	33485	0.01248
33386-34029	33720	0.01476
33586-34252	33928	0.01191
33821-34452	34152	0.00694
34030-34652	34352	0.00376
34253-34852	34552	0.00188
34453-35052	34752	0.0023
34653-35252	34952	0.00273
34853-35452	35152	0.00327
35053-35652	35352	0.00255
35253-35852	35552	0.00218
35453-36052	35752	0.00121
35653-36252	35952	0.00194
35853-36452	36152	0.00158
36053-36652	36352	0.00388
36253-36867	36552	0.00473
36453-37073	36752	0.00552
36653-37286	36967	0.00515
36868-37490	37186	0.00618
37074-37690	37386	0.00939
37287-37900	37590	0.01
37491-38110	37790	0.00958
37691-38310	38004	0.00558
37901-38510	38210	0.00358
38111-38710	38410	0.00303
38311-38910	38610	0.00479
38511-39110	38810	0.00467
38711-39310	39010	0.00303
38911-39510	39210	0.00327
39111-39710	39410	0.00382
39311-39910	39610	0.00455
39511-40110	39810	0.00291
39711-40310	40010	0.00339
39911-40510	40210	0.00297
40111-40710	40410	0.00261

rps3-rplI6 intron
rpoB-trnC(GCA)-petN

trnC(GCA)-petN-psbM
trnC(GCA)-petN-psbM
petN-psbM

ycfI

40311-40910	40610	0.00085
40511-41110	40810	0.00145
40711-41310	41010	0.00121
40911-41510	41210	0.00376
41111-41710	41410	0.00521
41311-41910	41610	0.00582
41511-42110	41810	0.00382
41711-42310	42010	0.00218
41911-42510	42210	0.0023
42111-42710	42410	0.00352
42311-42910	42610	0.00467
42511-43110	42810	0.00479
42711-43351	43010	0.0043
42911-43556	43210	0.007
43111-43771	43451	0.01039
43352-44017	43670	0.01203
43557-44227	43917	0.00921
43772-44444	44117	0.008
44018-44645	44344	0.01073
44228-44847	44545	0.01252
44445-45047	44747	0.00973
44646-45249	44947	0.00409
44848-45449	45147	0.00085
45048-45649	45349	0.00085
45250-45887	45549	0.00624
45450-46087	45787	0.00733
45650-46328	45987	0.01636
45888-46546	46204	0.01873
46088-46747	46440	0.03509
46329-46950	46646	0.02764
46547-47157	46850	0.02533
46748-47357	47050	0.01121
46951-47557	47257	0.01
47158-47757	47457	0.00455
47358-47965	47657	0.00091
47558-48237	47857	0.00588
47758-48445	48136	0.00933
47966-48779	48337	0.018
48238-48993	48650	0.01406
48446-49194	48893	0.01436
48780-49394	49094	0.00794
48994-49594	49294	0.01012
49195-49800	49494	0.00782
49395-50000	49700	0.0077
49595-50220	49900	0.00648
49801-50440	50116	0.00982
50001-50647	50321	0.01358
50221-50855	50547	0.01358
50441-51055	50747	0.00964
50648-51255	50955	0.00406
50856-51455	51155	0.00309
51056-51655	51355	0.00455
51256-51855	51555	0.00606
51456-52055	51755	0.00655
51656-52255	51955	0.00497
51856-52455	52155	0.00388
52056-53263	52355	0.00642
52256-53506	52555	0.01424
52456-53712	53398	0.01673
53264-53920	53611	0.01303
53507-54127	53820	0.00576
53713-54344	54022	0.00545
53921-54557	54227	0.01188
54128-54765	54444	0.01412
54345-54965	54665	0.01655
54558-55165	54865	0.01261
54766-55365	55065	0.01115

ycf3-trnS(GGA)
ycf3-trnS(GGA)
trnS(GGA)
ycf3-trnS(GGA)-rps4

trnL(UAA)-trnT(UGU)-rps4

54966-55565	55265	0.00709	
55166-55765	55465	0.00697	
55366-55965	55665	0.00564	
55566-56165	55865	0.00582	
55766-56365	56065	0.00218	
55966-56565	56265	0.00236	
56166-56782	56465	0.00594	
56366-56983	56667	0.01333	
56566-57196	56882	0.01661	
56783-57397	57092	0.01212	
56984-57597	57297	0.00691	
57197-57797	57497	0.00473	
57398-57997	57697	0.00721	
57598-58197	57897	0.00939	
57798-58397	58097	0.01024	
57998-58597	58297	0.00933	
58198-58822	58497	0.00733	
58398-59039	58697	0.00721	
58598-59244	58922	0.00909	
58823-59474	59139	0.01473	
59040-59674	59367	0.01539	
59245-59874	59574	0.01685	
59475-60074	59774	0.01164	
59675-60274	59974	0.01079	
59875-60474	60174	0.00752	
60075-60674	60374	0.00721	
60275-60874	60574	0.00594	
60475-61090	60774	0.00703	
60675-61350	60974	0.00788	
60875-61597	61208	0.01315	
61091-61806	61491	0.01564	
61351-62006	61697	0.01715	
61598-62206	61906	0.012	<i>accD-psaI-ycf4</i>
61807-62406	62106	0.00697	
62007-62606	62306	0.0037	
62207-62821	62506	0.00612	
62407-63021	62712	0.00885	
62607-63221	62921	0.0103	
62822-63421	63121	0.00776	
63022-63621	63321	0.00491	
63222-63841	63521	0.00388	
63422-64041	63741	0.00527	
63622-64241	63941	0.00612	
63842-64441	64141	0.00612	
64042-64641	64341	0.00709	
64242-64841	64541	0.00691	
64442-65049	64741	0.01176	
64642-65259	64941	0.01297	
64842-65459	65159	0.02406	<i>petA-psbJ</i>
65050-65681	65359	0.02764	<i>petA-psbJ</i>
65260-65884	65581	0.02733	<i>petA-psbJ</i>
65460-66084	65784	0.01679	
65682-66294	65984	0.00691	
65885-66494	66194	0.00339	
66085-66694	66394	0.00327	
66295-67329	66594	0.00491	
66495-67539	66794	0.00824	
66695-67754	67429	0.01315	
67330-67956	67646	0.01242	
67540-68193	67856	0.01164	
67755-68411	68093	0.00594	
67957-68649	68293	0.00618	
68194-68849	68511	0.00558	
68412-69094	68749	0.01048	
68650-69294	68992	0.01127	
68850-69526	69194	0.01048	
69095-69734	69417	0.00739	

69295-69959	69634	0.01067
69527-70176	69834	0.01067
69735-70376	70076	0.00921
69960-70580	70276	0.01388
70177-70780	70476	0.01364
70377-70980	70680	0.01394
70581-71180	70880	0.00497
70781-71401	71080	0.01352
70981-71601	71301	0.01521
71181-71805	71501	0.01788
71402-72005	71704	0.00794
71602-72205	71905	0.0077
71806-72405	72105	0.00691
72006-72610	72305	0.01273
72206-72820	72510	0.01345
72406-73023	72716	0.01285
72611-73223	72923	0.00709
72821-73423	73123	0.00576
73024-73624	73323	0.00921
73224-73843	73524	0.01261
73424-74048	73730	0.01352
73625-74270	73948	0.01182
73844-74470	74148	0.01309
74049-74671	74370	0.00976
74271-74871	74571	0.00715
74471-75071	74771	0.003
74672-75271	74971	0.00433
74872-75471	75171	0.00518
75072-75671	75371	0.00661
75272-75871	75571	0.00794
75472-76071	75771	0.00624
75672-76277	75971	0.00782
75872-76479	76177	0.01255
76072-76687	76379	0.01424
76278-76887	76587	0.01327
76480-77089	76787	0.01515
76688-77289	76988	0.01503
76888-77490	77189	0.01552
77090-77690	77390	0.00873
77290-77895	77590	0.00727
77491-78095	77795	0.00418
77691-78295	77995	0.00315
77896-78502	78195	0.00339
78096-78717	78395	0.00685
78296-78917	78617	0.01233
78503-79117	78817	0.01336
78718-79337	79017	0.01355
78918-79537	79217	0.00988
79118-79737	79437	0.00994
79338-79957	79637	0.00848
79538-80157	79837	0.01139
79738-80357	80057	0.01194
79958-80557	80257	0.01258
80158-80757	80457	0.00724
80358-80957	80657	0.00694
80558-81157	80857	0.00515
80758-81358	81057	0.00533
80958-81558	81258	0.00418
81158-81759	81458	0.00552
81359-81967	81658	0.00588
81559-82167	81859	0.00655
81760-82373	82067	0.00706
81968-82573	82273	0.00864
82168-82773	82473	0.00755
82374-82980	82673	0.01
82574-83180	82880	0.00994
82774-83385	83080	0.01285

rps12-rpl20

82981-83585	83280	0.01097	
83181-83785	83485	0.00909	
83386-84033	83685	0.01276	
83586-84260	83885	0.01558	
83786-84510	84142	0.01818	<i>rpl16 intron</i>
84034-84714	84395	0.01409	
84261-84954	84610	0.01139	
84511-85155	84814	0.02006	<i>rps3-rpl16 intron</i>
84715-85355	85055	0.0177	<i>rpoB-trnC(GCA)-petN</i>
84955-85555	85255	0.01594	
85156-85755	85455	0.00515	
85356-85965	85655	0.00721	
85556-86165	85865	0.00958	
85756-86498	86065	0.01912	<i>rps19-rpl22</i>
85966-86698	86290	0.01718	<i>rps19-rpl22</i>
86166-86901	86598	0.01403	
86499-87101	86801	0.00297	
86699-87301	87001	0.00158	
86902-87501	87201	0.00109	
87102-87701	87401	0.00164	
87302-87901	87601	0.00164	
87502-88101	87801	0.00055	
87702-88301	88001	0.00073	
87902-88501	88201	0.00103	
88102-88701	88401	0.00103	
88302-88901	88601	0.0003	
88502-89101	88801	0	
88702-89301	89001	0	
88902-89501	89201	0.00176	
89102-89701	89401	0.00321	
89302-89901	89601	0.00497	
89502-90101	89801	0.00321	
89702-90301	90001	0.00267	
89902-90501	90201	0.00309	
90102-90701	90401	0.00309	
90302-90901	90601	0.00345	
90502-91101	90801	0.00333	
90702-91301	91001	0.00333	
90902-91501	91201	0.00261	
91102-91701	91401	0.00055	
91302-91901	91601	0.00145	
91502-92101	91801	0.00248	
91702-92301	92001	0.00321	
91902-92501	92201	0.00376	
92102-92701	92401	0.00606	
92302-92901	92601	0.00533	
92502-93101	92801	0.00461	
92702-93301	93001	0.00073	
92902-93519	93201	0.00145	
93102-93719	93419	0.00176	
93302-93919	93619	0.00176	
93520-94119	93819	0.00309	
93720-94319	94019	0.00206	
93920-94519	94219	0.00333	
94120-94725	94419	0.00127	
94320-94925	94625	0.00127	
94520-95125	94825	0	
94726-95325	95025	0	
94926-95525	95225	0.0003	
9493-10094	9794	0.00915	
95126-95725	95425	0.00091	
95326-95930	95625	0.00667	
95526-96130	95830	0.00709	
95726-96330	96030	0.00648	
95931-96554	96230	0.00194	
96131-96754	96454	0.00121	
96331-96954	96654	0.00121	

96555-97154	96854	0
96755-97354	97054	0
9693-10295	9994	0.00776
96955-97554	97254	0
97155-97754	97454	0.0003
97355-97954	97654	0.00061
97555-98154	97854	0.00115
97755-98354	98054	0.00085
97955-98554	98254	0.00145
98155-98754	98454	0.00091
98355-98954	98654	0.004
98555-99154	98854	0.00382
98755-99354	99054	0.00382
9895-10521	10195	0.00836
98955-99554	99254	0.00073
99155-99754	99454	0.0003
99355-99954	99654	0.0003
99555-100154	99854	0.0003
99755-100354	100054	0
99955-100554	100254	0.00073

Table S5 Summary of major characteristics of the *Hydrocotyle* plastome protein-coding sequences (CDSs), including GC content (GC%), nucleotide diversity (Pi), non-synonymous substitutions (Ka), synonymous substitutions (Ks), and the average of the Ka/Ks ratio (ω). Numbers of $\omega \geq 1$ were recorded.

CDS	GC%	Pi	Ka	Ks	ω	$\omega > 1$	$\omega = 1$
<i>accD</i>	35.40%	0.00874	0.0056	0.0297	0.1898		
<i>atpA</i>	40.60%	0.00770	0.0051	0.0224	0.2760		
<i>atpB</i>	42.80%	0.00515	0.0009	0.0253	0.0388		
<i>atpE</i>	38.80%	0.01535	0.0198	0.0188	1.1224	16	1
<i>atpF</i>	39.00%	0.00886	0.0061	0.0271	0.2300		
<i>atpH</i>	44.60%	0.00311	0.0000	0.0217	0.0000		
<i>atpI</i>	38.30%	0.00600	0.0018	0.0225	0.0863		
<i>ccsA</i>	31.30%	0.00532	0.0053	0.0103	0.5912		
<i>cemA</i>	33.40%	0.00524	0.0037	0.0222	0.1802		
<i>clpP</i>	42.00%	0.00276	0.0000	0.0141	0.0000		
<i>infA</i>	36.10%	0.00616	0.0057	0.0211	0.2855		
<i>matK</i>	32.90%	0.01252	0.0123	0.0238	0.6661	2	
<i>ndhA</i>	34.80%	0.00875	0.0021	0.0380	0.0581		
<i>ndhB</i>	37.30%	0.00058	0.0000	0.0034	0.0000		
<i>ndhC</i>	35.50%	0.00259	0.0000	0.0151	0.0000		
<i>ndhD</i>	35.60%	0.00655	0.0044	0.0210	0.2745		
<i>ndhE</i>	33.50%	0.00455	0.0000	0.0262	0.0000		
<i>ndhF</i>	32.10%	0.00820	0.0066	0.0203	0.3390		
<i>ndhG</i>	36.50%	0.00623	0.0051	0.0334	0.1544		
<i>ndhH</i>	38.40%	0.00611	0.0014	0.0272	0.0565		
<i>ndhI</i>	35.80%	0.00834	0.0030	0.0342	0.0946		
<i>ndhJ</i>	40.00%	0.00159	0.0027	0.0094	0.2872		
<i>ndhK</i>	38.70%	0.00626	0.0020	0.0324	0.0678		
<i>petA</i>	40.20%	0.00632	0.0043	0.0201	0.2379		
<i>petB</i>	39.40%	0.00258	0.0041	0.0107	0.4745		

<i>petD</i>	39.30%	0.00694	0.0028	0.0335	0.0874		
<i>petG</i>	34.60%	0.00501	0.0000	0.0375	0.0000		
<i>petL</i>	34.90%	0.00980	0.0149	0.0408	0.3652		
<i>petN</i>	42.70%	0.01149	0.0000	0.0682	0.0000		
<i>psaA</i>	42.20%	0.00423	0.0008	0.0200	0.0511		
<i>psaB</i>	41.30%	0.00307	0.0008	0.0137	0.0622		
<i>psaC</i>	42.80%	0.00192	0.0000	0.0179	0.0000		
<i>psaI</i>	39.80%	0.00617	0.0162	0.0000	/		
<i>psbA</i>	42.10%	0.00235	0.0012	0.0081	0.1481		
<i>psbB</i>	42.90%	0.00631	0.0020	0.0262	0.1060		
<i>psbC</i>	43.10%	0.00287	0.0009	0.0099	0.1366		
<i>psbD</i>	42.40%	0.00237	0.0000	0.0124	0.0000		
<i>psbE</i>	40.20%	0.00509	0.0000	0.0287	0.0000		
<i>psbF</i>	43.10%	0.00399	0.0000	0.0328	0.0000		
<i>psbH</i>	37.30%	0.00842	0.0141	0.0223	0.6754		
<i>psbI</i>	35.80%	0.00432	0.0000	0.0385	0.0000		
<i>psbJ</i>	37.20%	0.00296	0.0000	0.0309	0.0000		
<i>psbK</i>	38.50%	0.00364	0.0000	0.0273	0.0000		
<i>psbL</i>	34.90%	0.00312	0.0000	0.0423	0.0000		
<i>psbN</i>	43.80%	0.00276	0.0000	0.0321	0.0000		
<i>psbT</i>	31.30%	0.00202	0.0000	0.0445	0.0000		
<i>psbZ</i>	36.30%	0.00358	0.0000	0.0242	0.0000		
<i>rbcL</i>	44.10%	0.00947	0.0069	0.0238	0.3153		
<i>rpl14</i>	40.80%	0.00771	0.0036	0.0484	0.0796		
<i>rpl16</i>	40.20%	0.00790	0.0057	0.0254	0.3765	8	
<i>rpl2</i>	44.60%	0.00057	0.0016	0.0000	/		
<i>rpl20</i>	34.90%	0.00419	0.0054	0.0128	0.4623	1	
<i>rpl22</i>	33.70%	0.01147	0.0083	0.0328	0.2833		
<i>rpl23</i>	38.30%	0.00072	0.0047	0.0000	/		
<i>rpl32</i>	36.00%	0.00850	0.0000	0.0532	0.0000		
<i>rpl33</i>	38.20%	0.00707	0.0066	0.0447	0.1477		
<i>rpoA</i>	35.20%	0.00825	0.0090	0.0139	0.8929	8	4
<i>rpoB</i>	39.20%	0.00402	0.0014	0.0167	0.0975		
<i>rpoC1</i>	38.80%	0.00521	0.0026	0.0181	0.1763		
<i>rpoC2</i>	38.10%	0.00566	0.0037	0.0169	0.2125		
<i>rps11</i>	46.70%	0.00381	0.0033	0.0224	0.1693		
<i>rps14</i>	42.50%	0.00185	0.0000	0.0161	0.0000		
<i>rps15</i>	30.60%	0.00982	0.0072	0.0423	0.1881		
<i>rps16</i>	39.70%	0.00902	0.0083	0.0235	0.4144	2	
<i>rps18</i>	34.90%	0.00271	0.0043	0.0144	0.2986		
<i>rps19</i>	35.70%	0.00258	0.0047	0.0159	0.2956		
<i>rps2</i>	37.60%	0.00439	0.0020	0.0206	0.1302		
<i>rps3</i>	34.50%	0.00501	0.0030	0.0176	0.2420		

<i>rps4</i>	39.50%	0.00232	0.0000	0.0125	0.0000	
<i>rps8</i>	34.00%	0.00591	0.0053	0.0156	0.4131	
<i>ycf15</i>	37.70%	0.00100	0.0063	0.0000	/	
<i>ycf1a</i>	29.70%	0.01730	0.0164	0.0289	0.5863	
<i>ycf1b</i>	35.30%	0.00576	0.0077	0.0092	0.9838	6
<i>ycf2</i>	38.00%	0.00267	0.0029	0.0041	0.7260	
<i>ycf3</i>	39.50%	0.00362	0.0000	0.0218	0.0000	
<i>ycf4</i>	40.70%	0.00334	0.0024	0.0134	0.2270	

Table S6. Details for the Ka and Ks values of four protein-coding sequences (*psaI*, *rpl2*, *rpl23*, *ycf15*) with Ks = 0.

1. Ka and Ks of *psaI*

Seq 1	Seq 2	Ka	Ks
<i>Hyrocotyle dielsiana</i>	<i>Hyrocotyle leucocephala</i>	0.025	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hyrocotyle leucocephala</i>	0.025	0
<i>Hyrocotyle leucocephala</i>	<i>Hyrocotyle nepalensis</i>	0.025	0
<i>Hyrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0.025	0
<i>Hyrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.025	0
<i>Hyrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.025	0
<i>Hyrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.025	0
<i>Hyrocotyle leucocephala</i>	<i>Hyrocotyle verticillata</i>	0.0124	0
<i>Hyrocotyle leucocephala</i>	<i>Hyrocotyle verticillata</i> _NC_015818	0.0124	0
<i>Hyrocotyle dielsiana</i>	<i>Hyrocotyle verticillata</i>	0.0123	0
<i>Hyrocotyle dielsiana</i>	<i>Hyrocotyle verticillata</i> _NC_015818	0.0123	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hyrocotyle verticillata</i>	0.0123	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hyrocotyle verticillata</i> _NC_015818	0.0123	0
<i>Hyrocotyle nepalensis</i>	<i>Hyrocotyle verticillata</i>	0.0123	0
<i>Hyrocotyle nepalensis</i>	<i>Hyrocotyle verticillata</i> _NC_015818	0.0123	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hyrocotyle verticillata</i>	0.0123	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hyrocotyle verticillata</i> _NC_015818	0.0123	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hyrocotyle verticillata</i>	0.0123	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hyrocotyle verticillata</i> _NC_015818	0.0123	0
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hyrocotyle verticillata</i>	0.0123	0
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hyrocotyle verticillata</i> _NC_015818	0.0123	0
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hyrocotyle verticillata</i>	0.0123	0
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hyrocotyle verticillata</i> _NC_015818	0.0123	0
<i>Hyrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hyrocotyle dielsiana</i>	<i>Hyrocotyle nepalensis</i>	0	0
<i>Hyrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hyrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hyrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0	0
<i>Hyrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hyrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hyrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hyrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hyrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0	0

<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0	0

2. Ka and Ks of *rpl2*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0.0016	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0016	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0016	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0016	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0016	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0016	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0016	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0016	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0016	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0016	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0016	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0016	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0.0016	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0016	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0016	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0016	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0016	0
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i>	0.0016	0
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i> _NC_015818	0.0016	0
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0016	0
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0016	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0	0

<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides var. batrachium</i>	0	0
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle sibthorpioides var. batrachium</i>	0	0
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0

3. Ka and Ks of *rpl23*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0.0047	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0.0047	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0.0047	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0.0047	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0047	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0047	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides var. batrachium</i>	0.0047	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0.0047	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0047	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides var. batrachium</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides var. batrachium</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides var. batrachium</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides var. batrachium</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides var. batrachium</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle sibthorpioides var. batrachium</i>	0	0
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata</i>	0	0

<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0

4. Ka and Ks of *ycf15*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0.0063	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0.0063	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0.0063	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0.0063	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0.0063	0
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata</i>	0.0063	0
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0063	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0063	0
<i>Hydrocotyle verticillata_NC_015818</i>	<i>Hydrocotyle verticillata</i>	0.0063	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle sibthorpioides</i>	0	0
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle sibthorpioides</i>	0	0

<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0	0

Table S7. Details for the Ka and Ks values of eight protein-coding sequences (*atpE*, *ccsA*, *matK*, *psbH*, *rpoA*, *ycf1a*, *ycf1b*, *ycf2*) with Ka/Ks (ω) >0.5.

1. Ka and Ks of *atpE*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0.0231	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0.0231	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0.0231	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0.0231	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0.0202	0.0094
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0.0202	0.0094
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0.0202	0.0094
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0.0202	0.0094
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.035	0.0188
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.035	0.0188
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0349	0.0189
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0216	0.0141
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0216	0.0141
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0216	0.0141
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0216	0.0141
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.032	0.0285
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i>	0.032	0.0285
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0319	0.0286
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0334	0.0333
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i> _NC_015818	0.0334	0.0333
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0334	0.0334
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0.0086	0.0093
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0.0115	0.0189
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0115	0.0189
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0115	0.0189
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0115	0.0189
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0115	0.0189
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0115	0.0189
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0.0115	0.0189
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0115	0.0189
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0057	0.0094
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0114	0.019
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0114	0.019
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0114	0.019
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0114	0.019

<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0086	0.0188
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0.019
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0.019

2. Ka and Ks of *ccsA*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0	0
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0013	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0081	0.0093
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0081	0.0093
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0.004	0.0046
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0.004	0.0046
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.004	0.0046
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0.004	0.0046
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.004	0.0046
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.004	0.0046
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0.004	0.0046
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0.004	0.0046
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.004	0.0046
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.004	0.0046
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0094	0.0139
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i>	0.0094	0.0139
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0.0054	0.0092
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0.0054	0.0092
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0027	0.0046
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0.0054	0.0092
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0081	0.0139
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i> _NC_015818	0.0081	0.0139
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.004	0.0092
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.004	0.0092
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0.004	0.0092
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.004	0.0092
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0.004	0.0093
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.004	0.0093
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.004	0.0093
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.004	0.0093
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0.0054	0.0139
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0054	0.014
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0054	0.014
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0054	0.014
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0067	0.0187
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0081	0.0234
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0054	0.0187
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.004	0.0139
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0067	0.0234
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0.0046
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0.0046

3. Ka and Ks of *matK*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0009	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0.0009	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0.0009	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0.0009	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0129	0.0029
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0.0103	0.0058
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0.0112	0.0116
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0.0112	0.0116
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0.0112	0.0116
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0026	0.0029
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0208	0.0233
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0225	0.0294
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0216	0.0294
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0.0103	0.0145
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0181	0.0262
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0199	0.0323
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.019	0.0322
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0077	0.0145
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0155	0.0292
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0172	0.0353
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0069	0.0145
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0069	0.0145
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0069	0.0145
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata</i>	0.0164	0.0353
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0129	0.0291
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0129	0.0291
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0129	0.0291
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0.0146	0.0352
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0146	0.0352
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0146	0.0352
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0069	0.0174
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0138	0.0352
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0138	0.0352
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0138	0.0352
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0121	0.0321
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0.0138	0.0382
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.006	0.0174
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0.006	0.0174
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0.006	0.0174
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0.006	0.0174
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0129	0.0382
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0.0051	0.0203

4. Ka and Ks of *psbH*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0121	0
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0121	0
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0.0182	0.0194
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0182	0.0194
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0182	0.0194
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0182	0.0194
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0182	0.0194
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0182	0.0194
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0.0182	0.0194
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0182	0.0194
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0182	0.0194
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0182	0.0194
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata</i>	0.0182	0.0194
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0182	0.0194
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0182	0.0393
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0182	0.0393
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.006	0.0195
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.006	0.0195
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.006	0.0195
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.006	0.0195
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.006	0.0195
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.006	0.0195
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.006	0.0394
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0	0.0194
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0	0.0194
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0	0.0194
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0	0.0194
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0	0.0194
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0.0194

5. Ka and Ks of *rpoA*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0	0
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0012	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0086	0.0043
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0086	0.0043
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0086	0.0043
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0086	0.0043
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0.0074	0.0043
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0.0074	0.0043
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0.0074	0.0043
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0.0074	0.0043
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0086	0.0086
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0086	0.0086
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0086	0.0086
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0086	0.0086
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0.0074	0.0086
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0.0074	0.0086
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0.0074	0.0086
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0.0074	0.0086
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0.0111	0.0173
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0111	0.0173
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0111	0.0173
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0111	0.0173
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0111	0.0173
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0111	0.0173
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0.0111	0.0173
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0111	0.0173
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0098	0.0173
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0086	0.0173
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0061	0.0129
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0123	0.0262
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i> _NC_015818	0.0123	0.0262
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0111	0.0262
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i>	0.0111	0.0262
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0086	0.0217
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0.0049	0.0129
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0049	0.013
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0049	0.013
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0111	0.0306
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0111	0.0306

6. Ka and Ks of *ycf1a*

Seq 1	Seq 2	Ka	Ks
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<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0.0002	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0.0002	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0.0014	0.0018
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0134	0.0189
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0143	0.0202
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0132	0.0189
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0132	0.0189
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0037	0.0053
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0.0012	0.0018
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0.0012	0.0018
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0.0127	0.0198
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0.0125	0.0198
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0.0125	0.0198
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0266	0.0422
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0266	0.0422
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0.0138	0.022
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0.0129	0.0207
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0.0134	0.0216
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0.0127	0.0207
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0.0127	0.0207
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0268	0.0459
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i> _NC_015818	0.0268	0.0459
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0242	0.042
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0268	0.0468
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i>	0.0268	0.0468
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0244	0.043
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0244	0.0448
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0101	0.0189
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0.0213	0.0402
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0213	0.0402
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0203	0.0384
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0203	0.0384
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0201	0.0384
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0201	0.0384
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0.0201	0.0384
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0201	0.0384
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0.0096	0.0189
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0194	0.0382
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0184	0.0364
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0182	0.0364
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0182	0.0364
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0084	0.019
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0084	0.019

7. Ka and Ks of *ycf1b*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0

<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0063	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0.0095	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0079	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0063	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0.0095	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0079	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0063	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0.0095	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0079	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0063	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0.0095	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0079	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0	0
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0095	0
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0079	0
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0016	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0.0095	0.0052
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0.0095	0.0052
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0.0095	0.0052
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0.0095	0.0052
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0095	0.0052
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0.0063	0.0052
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0095	0.0104
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i>	0.0095	0.0104
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0047	0.0052
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0079	0.0104
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i> _NC_015818	0.0079	0.0104
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0095	0.0156
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0095	0.0156
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0.0063	0.0104
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0063	0.0104
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0063	0.0104
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0063	0.0104
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0063	0.0104
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0063	0.0104
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0.0063	0.0104
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0063	0.0104
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0.0104
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0.0104

8. Ka and Ks of *ycf2*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0

<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0008	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0047	0.0051
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0047	0.0051
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata</i>	0.0047	0.0051
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0047	0.0051
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0053	0.0058
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0053	0.0058
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0039	0.0043
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0039	0.0043
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0045	0.0051
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0.0024	0.0029
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0.0024	0.0029
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0.0024	0.0029
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0.0024	0.0029
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0.0018	0.0022
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0018	0.0022
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0.0018	0.0022
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0018	0.0022
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0.0018	0.0022
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0018	0.0022
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0.0018	0.0022
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0018	0.0022
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0.0018	0.0022
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0018	0.0022
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0.0033	0.0058
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0033	0.0058
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0033	0.0058
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0033	0.0058
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0033	0.0058
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0033	0.0058
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0.0033	0.0058
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0033	0.0058
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0024	0.0051
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0024	0.0051
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0024	0.0051
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0024	0.0051
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0008	0.0022
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0008	0.0022

Table S8. Details for the Ka and Ks values of three protein-coding sequences (*rpl16*, *rpl20*, *rps16*) with some Ka/Ks ≥ 1 .

1. Ka and Ks of *rpl16*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0

<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0066	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0066	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0066	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0066	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0.01	0.0098
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.01	0.0098
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.01	0.0098
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.01	0.0098
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.01	0.0098
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.01	0.0098
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0.01	0.0098
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.01	0.0098
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0033	0.0098
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0033	0.0098
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0066	0.0298
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> _NC_035502	0.0066	0.0298
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0033	0.0197
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0.0033	0.0198
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0.0033	0.0198
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0.0033	0.0198
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0.0033	0.0198
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0066	0.0399
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i> _NC_015818	0.0066	0.0399
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0066	0.0503
<i>Hydrocotyle sibthorpioides</i> _NC_035502	<i>Hydrocotyle verticillata</i>	0.0066	0.0503
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0033	0.0298
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0033	0.0299
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0033	0.0299
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0033	0.0299
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0.0033	0.0299
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0033	0.0399
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0.0033	0.0401
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0.0033	0.0401
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0.0033	0.0401
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0.0033	0.0401
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0	0.0197
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0	0.0098
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata</i> _NC_015818	0	0.0098

2. Ka and Ks of *rpl20*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0.0101	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0.0034	0

<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0034	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0.0101	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0.0034	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0034	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0.0101	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0.0101	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0.0067	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0067	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0.0034	0
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0034	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0.0034	0
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0034	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0136	0.0112
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0101	0.0113
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0101	0.0113
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0068	0.0112
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0068	0.0112
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0034	0.0112
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0034	0.0112
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0034	0.0112
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0034	0.0112
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0034	0.0113
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0034	0.0113
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata</i>	0.0034	0.0113
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0034	0.0113
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0034	0.0226
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0034	0.0226
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0	0.0113
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0.0113
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0	0.0113
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0.0113
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0	0.0113
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0.0113
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0	0.0113
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0.0113

3. Ka and Ks of *rps16*

Seq 1	Seq 2	Ka	Ks
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle nepalensis</i>	0	0
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata</i>	0.0116	0
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0058	0

<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle pseudoconferta</i>	0	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0	0
<i>Hydrocotyle verticillata</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0058	0
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata</i>	0.0174	0.0169
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata</i>	0.0174	0.0169
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0116	0.0169
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0116	0.0169
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata</i>	0.0116	0.017
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata</i>	0.0116	0.017
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata</i>	0.0116	0.017
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata</i>	0.0116	0.017
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0058	0.0169
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0058	0.0169
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i>	0.0058	0.0169
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0058	0.0169
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0058	0.0169
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0058	0.0169
<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0058	0.0169
<i>Hydrocotyle sibthorpioides_NC_035502</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0.0058	0.0169
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata</i>	0.0116	0.0343
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i>	0.0058	0.0341
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0058	0.0341
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0058	0.0341
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0058	0.0341
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i>	0.0058	0.0341
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0058	0.0341
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i>	0.0058	0.0341
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides_NC_035502</i>	0.0058	0.0341
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	<i>Hydrocotyle verticillata_NC_015818</i>	0.0058	0.0343
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle leucocephala</i>	0	0.0169
<i>Hydrocotyle dielsiana</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0.052
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle leucocephala</i>	0	0.0169
<i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0.052
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle nepalensis</i>	0	0.0169
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle pseudoconferta</i>	0	0.0169
<i>Hydrocotyle leucocephala</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0.0343
<i>Hydrocotyle nepalensis</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0.052
<i>Hydrocotyle pseudoconferta</i>	<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	0	0.052

Table S9. The potential positive selection test on difference taxa within *Hydrocotyle*. Abbreviations of the foreground branch are shown at the end of the table.

Gene name	foreground branch	Null hypothesis			Alternative hypothesis			Significance test	LRT P-value
		lnL	np	omega ($\omega=1$)	lnL	np	omega ($\omega>1$)		
<i>ycf1a</i>	SB	-8957.464189	21	1	-8964.793288	22	1	1466 H 0.710,1531 D 0.529,1710 R 0.684	0.000128873
<i>ycf1a</i>	Clade I	-8959.775828	21	1	-8963.147371	22	1		0.009411169
<i>matK</i>	L	-2371.269118	21	1	-2369.127683	22	109.43917	116 L 0.987*,151 V 0.987*,166 V 0.987*,297 K 0.988*, 320 I 0.988*,327 N 0.988*,409 R 0.988*,411 C 0.988*,486 R 0.988*	0.038498292
<i>atpE</i>	NM	-731.899704	21	1	-730.328767	22	999.00000	54 L 0.957*,73 N 0.962*,92 L 0.965* ,105 D 0.949,129 I 0.947, 144 N 0.965*	0.076306088
<i>ycf2</i>	NM	-8836.736895	21	1	-8835.570713	22	107.70649	127 G 0.964*, 223 E 0.962*, 274 T 0.962*, 1251 K 0.961*, 1573 D 0.962*	0.126709323
<i>ycf1b</i>	SB	-1215.809396	21	1	-1215.126851	22	186.78628	245 I 0.909, 253 P 0.928, 258 K 0.922,	0.242657284
<i>rpoA</i>	Clade I	-1564.874004	21	1	-1564.196201	22	999.00000	118 S 0.831, 217 Y 0.757	0.244300454
<i>psbH</i>	S	-311.81039	21	1	-311.302282	22	999.00000	9 D 0.927, 19 I 0.927	0.313418269
<i>rpl20</i>	L	-544.502374	21	1	-544.084612	22	999.00000	99 Q 0.923, 120 V 0.923	0.360680055
<i>psaI</i>	NM	-147.549381	21	1	-147.204025	22	999.00000	27 F 0.792	0.405922309
<i>rpl2</i>	SB	-1100.472519	21	1	-1100.138638	22	999.00000	12 S 0.800	0.413832965
<i>rps16</i>	S	-344.692246	21	1	-344.455527	22	999.00000		0.491409765
<i>rpl23</i>	L	-374.905141	21	1	-374.733331	22	999.00000	39 V 0.800	0.557747105
<i>rpl16</i>	SB	-576.024885	21	1	-575.857576	22	999.00000	26 N 0.710	0.562952412
<i>rpl16</i>	Clade I	-576.031768	21	1	-575.866143	22	999.00000		0.564923968
<i>rpoA</i>	NM	-1565.455264	21	1	-1565.455264	22	999.00000	53 V 0.514,110 Q 0.509,280 Q 0.514,290 P 0.508,495 N 0.508,588 F 0.507,602 S 0.513,765 K 0.509,869 R 0.510,891 V 0.509,912 E 0.509,936 N 0.514,991 S 0.513,1053 P 0.507,1124 Y 0.505,1545 V 0.511,1612 K 0.511,1650 K 0.511,1656 T 0.511	0.573894248
<i>ycf1a</i>	NM	-8956.461261	21	1	-8956.386989	22	2.02733		0.699930665
<i>ccsA</i>	SB	-1409.328591	21	1	-1409.328591	22	1	23 T 0.573, 175 G 0.573	1

<i>ycf1b</i>	NM	-1216.031855	21	1	-1215.572739	22	999.00000	53 V 0.660,110 Q 0.686	0.337939620
<i>ycf15</i>	Vnewly	-272.882619	21	1	-272.472137	22	999.00000	53 H 0.800	0.364898466
<i>rps16</i>	Vnewly	-344.677385	21	1	-344.432454	22	999.00000	47 C 0.884	0.483988870
<i>matK</i>	Snewly	-2373.310502	21	1	-2373.071580	22	80.86109	294 L 0.852	0.489400522
<i>rpl20</i>	NM	-544.884103	21	1	-544.674492	22	999.00000	51 D 0.835	0.517325507
<i>ccsA</i>	Vnewly	-1408.998164	21	1	-1408.801675	22	73.56551	282 I 0.904	0.530738178
<i>ycf1b</i>	B	-1216.488937	21	1	-1216.300815	22	3.78136		0.539620271
<i>rpoA</i>	V	-1565.619441	21	1	-1565.601047	22	74.80511		0.847897319
<i>rpl20</i>	Clade I	-545.129318	21	1	-545.129271	22	3.21929		0.992264343
<i>matK</i>	V	-2373.445624	21	1	-2373.445643	22	1	16 H 0.539,30 A 0.538,474 S 0.537	0.995081540
<i>ccsA</i>	Vold	-1409.477750	21	1	-1409.477758	22	3.90512		0.996808470
<i>ycf2</i>	SB	-8837.198294	21	1	-8837.198291	22	1		0.998045592
<i>matK</i>	S	-2373.570525	21	1	-2373.570527	22	3.17203		0.998404232
<i>matK</i>	Clade I	-2373.570520	21	1	-2373.570520	22	1		1
<i>psbH</i>	B	-312.752334	21	1	-312.752334	22	3.48470		1.000000000

foreground branch abbreviation:

Taxa	Branch
<i>Hydrocotyle leucocephala</i>	L
<i>Hydrocotyle verticillata</i> (two taxa)	V
<i>Hydrocotyle leucocephala</i> + <i>Hydrocotyle verticillata</i>	NM
<i>Hydrocotyle sibthorpioides</i> + <i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	SB
<i>Hydrocotyle sibthorpioides</i> var. <i>batrachium</i>	B
<i>Hydrocotyle sibthorpioides</i>	S
<i>Hydrocotyle dielsiana</i> + <i>Hydrocotyle hookeri</i> subsp. <i>chinensis</i> + <i>Hydrocotyle pseudoconferta</i> + <i>Hydrocotyle nepalensis</i>	Clade I
<i>Hydrocotyle verticillata</i> (OR767312)	Vnewly
<i>Hydrocotyle sibthorpioides</i> (OR767311)	Snewly
<i>Hydrocotyle verticillata</i> (NC_015818)	Vold

Table S10. The potential positive selection test on *Hydrocotyle*.

Gene name	Null hypothesis			Alternative hypothesis			Significance test Positively selected sites (BEB, *: P > 95%; **: P > 99%)	LRT P-value
	lnL	np	omega ($\omega=1$)	lnL	np	omega ($\omega>1$)		
<i>ycf1b</i>	-3362.447725	59	1	-3324.388401	60	999.00000	32 M 0.542,64 A 0.803,167 I 0.807,199 R 0.521,229 S 0.802,321 - 0.794,327 E 0.514, 328 R 0.991** , 329 L 0.994** , 330 I 0.996** , 331 H 0.997** ,332 K 0.779,333 T 0.809, 334 N 0.976* , 336 R 0.986* , 337 K 0.988* ,338 D 0.775,339 K 0.794, 450 R 0.986* ,451 C 0.589,452 A 0.579, 453 R 0.984* ,454 H 0.909, 455 L 0.977* , 456 Q 0.976* ,457 I 0.820	0.000000000
<i>matK</i>	-7024.419554	59	1	-7011.441104	60	29.49559	35 H 0.830, 81 N 0.963* ,325 R 0.717,360 S 0.537, 494 Y 0.996** ,495 R 0.939, 496 R 0.951* , 513 E 0.970*	0.000000349
<i>atpF</i>	-2046.963998	59	1	-2044.015786	60	75.02950	174 G 0.869	0.015171658
<i>accD</i>	-5739.029672	59	1	-5736.265650	60	39.66167	51 D 0.920,506 K 0.557	0.018714015
<i>rps14</i>	-860.835744	59	1	-858.387320	60	77.06502	3 R 0.754, 37 L 0.965*	0.026905763
<i>psbB</i>	-4035.081518	59	1	-4032.641959	60	33.47575	20 L 0.590,38 A 0.590,97 A 0.629, 98 G 0.957* ,484 P 0.609,488 A 0.561,508 V 0.596	0.027183506
<i>ndhC</i>	-974.504146	59	1	-973.220870	60	66.51188	26 F 0.782	0.109145397
<i>atpA</i>	-4410.682485	59	1	-4409.692489	60	9.60973	4 I 0.569,436 M 0.892,453 Q 0.566,472 F 0.569,483 T 0.598	0.159391250
<i>ndhJ</i>	-1304.653007	59	1	-1303.790559	60	6.60558	4 R 0.970* ,26 I 0.627,75 E 0.631,118 L 0.651	0.189064040
<i>ycf2</i>	-16102.821931	59	1	-16102.304497	60	6.08506	1428 P 0.708	0.309018051
<i>ycf1a</i>	-7210.491689	59	1	-7209.984768	60	8.60888	571 E 0.706	0.313984171
<i>ndhD</i>	-5150.230460	59	1	-5149.884781	60	14.24887	366 I 0.503,368 T 0.743	0.405702858
<i>clpP</i>	-1743.859192	59	1	-1743.613790	60	2.40664	11 R 0.829,12 S 0.866,42 E 0.835,75 I 0.535,79 A 0.880,80 I 0.887,106 I 0.856,135 A 0.597,168 V 0.597,197 E 0.546	0.483568878
<i>psbD</i>	-2307.905544	59	1	-2307.717658	60	12.36849	8 F 0.657,12 E 0.658,13 K 0.697,18 I 0.547,137 V 0.596	0.539874722
<i>psbH</i>	-684.179015	59	1	-683.997736	60	2.13697	23 L 0.565,30 Y 0.588	0.547089009
<i>psbK</i>	-451.810040	59	1	-451.646047	60	45.94343	24 A 0.668	0.566847418
<i>atpE</i>	-1578.065299	59	1	-1577.952681	60	1.92106	51 I 0.533,88 S 0.506	0.635078986
<i>rpl14</i>	-1120.974573	59	1	-1120.900704	60	11.73038	69 L 0.709	0.700706447

<i>psbA</i>	-2445.970241	59	1	-2445.913547	60	5.13222	231 E 0.517	0.736319431
<i>ndhI</i>	-1627.512291	59	1	-1627.461357	60	2.49288	27 M 0.694,156 R 0.644	0.749599373
<i>petD</i>	-1283.929764	59	1	-1283.903275	60	3.87165	153 K 0.562	0.817960059
<i>rpl20</i>	-1387.472995	59	1	-1387.453148	60	2.05349		0.842080071
<i>psbC</i>	-3325.451540	59	1	-3325.468203	60	1		0.855147901
<i>psbZ</i>	-405.747898	59	1	-405.744690	60	4.04932	3 L 0.604	0.936157772
<i>ndhB</i>	-2588.843751	59	1	-2588.844217	60	1		0.975645425
<i>rps12</i>	-877.523903	59	1	-877.523820	60	1		0.989720261
<i>rps19</i>	-823.346939	59	1	-823.347020	60	1		0.989844862
<i>rps7</i>	-736.482887	59	1	-736.482826	60	1	37 S 0.515	0.991187256
<i>psbN</i>	-247.020621	59	1	-247.020662	60	3.50786		0.992774947
<i>rpl23</i>	-483.403453	59	1	-483.403488	60	1		0.993324497
<i>psbI</i>	-235.071633	59	1	-235.071659	60	1		0.994246422
<i>petA</i>	-3003.323881	59	1	-3003.323876	60	1		0.997476872
<i>rpoB</i>	-9337.837508	59	1	-9337.837509	60	1	29 D 0.584,59 Q 0.550,138 E 0.574,595 K 0.550,612 V 0.552,635 I 0.581,715 L 0.538,1028 I 0.584	0.998871621
<i>rpoC1</i>	-6073.113542	59	1	-6073.113541	60	1	4 N 0.509,22 V 0.512,80 N 0.518,83 V 0.506,193 T 0.504,219 I 0.549,432 V 0.512	0.998871621
<i>atpB</i>	-4069.732139	59	1	-4069.732139	60	1		1
<i>atpH</i>	-517.387894	59	1	-517.387894	60	1		1
<i>atpI</i>	-2070.308397	59	1	-2070.308397	60	1	156 K 0.542,212 V 0.517	1
<i>cemA</i>	-2295.242624	59	1	-2295.242624	60	1		1
<i>infA</i>	-723.899930	59	1	-723.899930	60	1		1
<i>ndhA</i>	-3619.645350	59	1	-3619.645350	60	1		1
<i>ndhE</i>	-934.970106	59	1	-934.970106	60	1	61 I 0.508	1
<i>ndhF</i>	-9334.884802	59	1	-9334.884802	60	1		1
<i>ndhG</i>	-1665.397645	59	1	-1665.397645	60	1	165 V 0.561	1
<i>ndhH</i>	-3687.152095	59	1	-3687.152095	60	1		1
<i>ndhK</i>	-2009.710884	59	1	-2009.710884	60	1	53 I 0.650,219 V 0.615,220 S 0.595	1
<i>petB</i>	-1515.434641	59	1	-1515.434641	60	1		1

<i>petG</i>	-292.475138	59	1	-292.475138	60	1		1
<i>petL</i>	-285.946404	59	1	-285.946404	60	3.72046		1
<i>petN</i>	-171.484866	59	1	-171.484866	60	1		1
<i>psaA</i>	-5290.377579	59	1	-5290.377579	60	1		1
<i>psaB</i>	-5020.303397	59	1	-5020.303397	60	1		1
<i>psaC</i>	-558.974089	59	1	-558.974089	60	1		1
<i>psaJ</i>	-320.391604	59	1	-320.391604	60	1		1
<i>psbE</i>	-504.189886	59	1	-504.189886	60	1		1
<i>psbF</i>	-216.400417	59	1	-216.400417	60	1		1
<i>psbJ</i>	-262.260425	59	1	-262.260425	60	1		1
<i>psbL</i>	-204.764289	59	1	-204.764289	60	1		1
<i>psbM</i>	-362.721880	59	1	-362.721880	60	1		1
<i>psbT</i>	-233.880612	59	1	-233.880612	60	1	29 V 0.844,30 P 0.859,31 T 0.841	1
<i>rbcL</i>	-4352.660397	59	1	-4352.660397	60	1		1
<i>rpl22</i>	-1533.329343	59	1	-1533.329343	60	1		1
<i>rpl32</i>	-517.553873	59	1	-517.553873	60	1	19 I 0.850,43 S 0.848	1
<i>rpl33</i>	-663.657613	59	1	-663.657613	60	1	53 P 0.504	1
<i>rpl36</i>	-281.042835	59	1	-281.042835	60	1		1
<i>rpoC2</i>	-14835.200435	59	1	-14835.200435	60	1		1
<i>rps2</i>	-2031.807022	59	1	-2031.807022	60	1	38 K 0.531,88 A 0.581	1
<i>rps3</i>	-2026.885794	59	1	-2026.885794	60	1		1
<i>rps4</i>	-1683.600613	59	1	-1683.600613	60	1		1
<i>rps8</i>	-1410.248265	59	1	-1410.248265	60	1		1
<i>rps11</i>	-1263.118779	59	1	-1263.118779	60	1	14 G 0.523	1
<i>rps15</i>	-1180.016776	59	1	-1180.016776	60	1		1
<i>rps18</i>	-760.442968	59	1	-760.442968	60	1		1
<i>ycf3</i>	-1184.251948	59	1	-1184.251948	60	1	31 G 0.541	1
<i>ycf4</i>	-1558.562482	59	1	-1558.562482	60	1		1
<i>ccsA</i>	-3932.257478	59	1	-3932.257478	60	1	204 R 0.506	1

<i>psaI</i>	-352.680352	59	1	-352.680352	60	1	1
<i>rpl2</i>	-1538.092630	59	1	-1538.092630	60	1	1
<i>rpl16</i>	-1154.372340	59	1	-1154.372340	60	1	1
<i>rpoA</i>	-3585.863243	59	1	-3585.863243	60	1	1
<i>rps16</i>	-651.431732	57	1	-651.431732	58	1	1

Figure S1. MAUVE alignment of ten *Hydrocotyle* plastomes using Geneious.

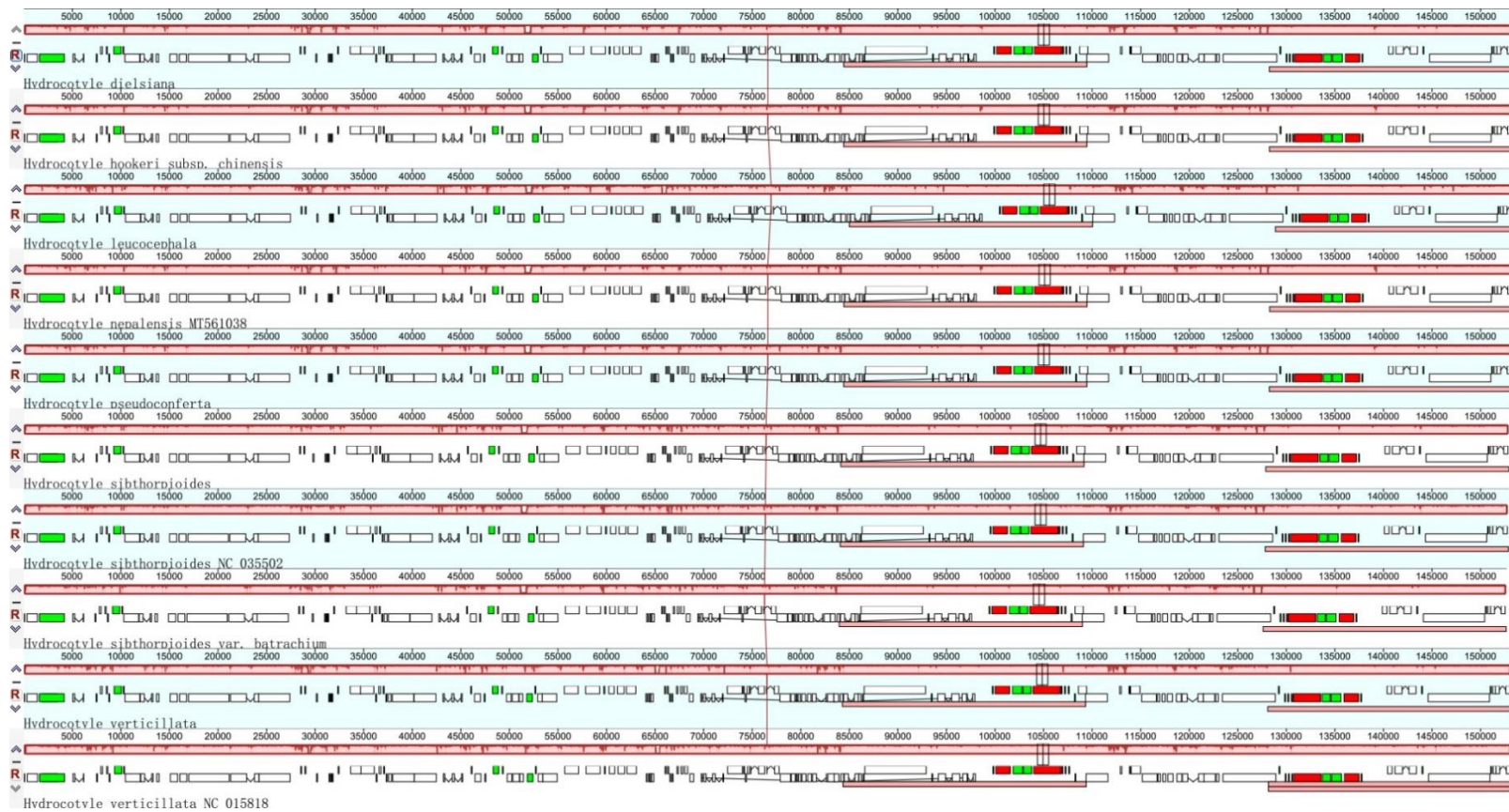


Figure S2. Six voucher specimens of the newly sequenced species were deposited in NAS (Herbarium, Institute of Botany, Chinese Academy of Sciences, Jiangsu Province).

NAS00638751: *Hydrocotyle hookeri* subsp. *chinensis*



NAS00638767: *Hydrocotyle dielsiana*



湖北
HUBEI

Wj-20210901-01
裂叶天胡荽
Jun Wen 2021.7.20

中国科学院
植物研究所
南京
中山植物园

00820423

NAS00638767

江苏省·中国科学院植物研究所标本馆 (NAS)
裂叶天胡荽, *Hydrocotyle dielsiana* H. Wolff
鉴定人: Jun Wen
采集地: 中国, 湖北省神农架官门山景区
海拔: m
采集人: Jun Wen
Wj-20210901-01
经纬度: 110.387546°, 31.442716°
2021-9-8

NAS00638784: *Hydrocotyle sibthorpioides* var. *batrachium*



NAS00638788: *Hydrocotyle verticillata*



NAS00638791: *Hydrocotyle leucocephala*



NAS00638796: *Hydrocotyle sibthorpioides*

