

Additional file 1. 133 taxa from 56 orders included in phylogenetic analyses with APG III ordinal classification.

Taxon	APGIII Order	GenBank Accession Number	Genes Not Included
Gymnosperms(3)			
<i>Picea abies</i>	Coniferales	NC_021456	<i>ndhA, ndhB, ndhC, ndhD, ndhE, ndhF, ndhG, ndhH, ndhI, ndhJ, ndhK, rps16</i>
<i>Cycas taitungensis</i>	Cycadales	NC_009618	
<i>Ginkgo biloba</i>	Ginkgoales	NC_016986	<i>psbZ, ycf1</i>
Basal Angiosperms (7)			
<i>Amborella trichopoda</i>	Amborellales	NC_005086	<i>petL, psal, psbM</i>
<i>Illicium oligandrum</i>	Austrobaileyales	NC_009600	
<i>Chloranthus spicatus</i>	Chloranthales	NC_009598	
<i>Nuphar advena</i>	Nymphaeales	NC_008788	
<i>Nymphaea alba</i>	Nymphaeales	NC_006050	
<i>Trithuria inconspicua</i>	Nymphaeales	NC_020372	<i>clpP</i>
Magnoliids(5)			
<i>Drimys granadensis</i>	Canellales	NC_008456	
<i>Calycanthus floridus</i>	Laurales	NC_004993	
<i>Liriodendron tulipifera</i>	Magnoliales	NC_008326	<i>rpl22</i>
<i>Magnolia kwangsiensis</i>	Magnoliales	NC_015892	<i>rpl22</i>
<i>Piper cenocladum</i>	Piperales	NC_008457	
Monocots (29)			
<i>Acorus calamus</i>	Acorales	NC_007407	<i>accD</i>
<i>Lemna minor</i>	Alismatales	NC_010109	<i>infA</i>
<i>Colocasia esculenta</i>	Alismatales	NC_016753	<i>infA</i>
<i>Elodea canadensis</i>	Alismatales	NC_018541	
<i>Najas flexilis</i>	Alismatales	NC_021936	<i>infA, ndhA, ndhB, ndhC, ndhD,</i>

			<i>ndhE, ndhF, ndhG, ndhH, ndhI, ndhJ, ndhK, psbH</i>
<i>Spirodela polyrhiza</i>	Alismatales	NC_015891	<i>infA, rpl20, rps12</i>
<i>Wolffia australiana</i>	Alismatales	NC_015899	<i>infA, rps12</i>
<i>Bismarckia nobilis</i>	Arecales	NC_020366	
<i>Cocos nucifera</i>	Arecales	NC_022417	
<i>Elaeis guineensis</i>	Arecales	NC_017602	
<i>Pseudophoenix vinifera</i>	Arecales	NC_020364	
<i>Phoenix dactylifera</i>	Arecales	NC_013991	
<i>Phalaenopsis aphrodite</i>	Asparagales	NC_007499	<i>ndhA, ndhB, ndhC, ndhD, ndhE, ndhF, ndhG, ndhH, ndhI, ndhJ, ndhK, ycf1</i>
<i>Cymbidium aloifolium</i>	Asparagales	NC_021429	<i>ndhA, ndhB, ndhC, ndhD, ndhF, ndhG, ndhH, ndhI, ndhK,</i>
<i>Erycina pusilla</i>	Asparagales	NC_018114	<i>ndhA, ndhB, ndhC, ndhD, ndhE, ndhF, ndhG, ndhH, ndhI, ndhJ, ndhK, ycf1</i>
<i>Neottia nidus-avis</i>	Asparagales	NC_016471	<i>atpA, atpB, atpE, atpF, atpH, atpI, ccsA, cemA, matK, ndhA, ndhB, ndhC, ndhD, ndhE, ndhF, ndhG, ndhH, ndhI, ndhJ, ndhK, petA, petB, petD, petG, petL, petN, psaA, psaB, psaC, psaI, psaJ, psbA, psbB, psbC, psbD, psbE, psbF, psbH, psbI, psbJ, psbK, psbL, psbM, psbN, psbT, psbZ, rbcL, rpoA, rpoB, rpoC1, rpoC2, rps18, ycf3, ycf4</i>
<i>Oncidium Gower Ramsey</i>	Asparagales	NC_014056	<i>ndhA, ndhB, ndhC, ndhD, ndhF, ndhG, ndhH, ndhI, ndhJ, ndhK, ycf1</i>
<i>Rhizanthella gardneri</i>	Asparagales	NC_014874	<i>atpA, atpB, atpE, atpF, atpH, atpI, ccsA, cemA, matK, ndhA, ndhB, ndhC, ndhD, ndhE, ndhF, ndhG, ndhH, ndhI, ndhJ, ndhK, petA, petB, petD, petG, petL, petN, psaA, psaB, psaC, psaI, psaJ, psbA, psbB, psbC, psbD,</i>

			<i>psbE, psbF, psbH, psbI, psbJ, psbK, psbL, psbM, psbN, psbT, psbZ, rbcL, rpl22, rpl32, rpl33, rpoA, rpoB, rpoC1, rpoC2, rps12, rps15, rps16, ycf3, ycf4</i>
<i>Dioscorea elephantipes</i>	Dioscoreales	NC_009601	<i>rps16</i>
<i>Veratrum patulum</i>	Liliales	NC_022715	<i>infA, rps16</i>
<i>Bambusa emeiensis</i>	Poales	NC_015830	<i>accD, ycf1, ycf2</i>
<i>Oryza sativa</i>	Poales	NC_001320	<i>accD, psaJ, ycf1, ycf2</i>
<i>Lolium perenne</i>	Poales	NC_009950	<i>accD, ycf1, ycf2</i>
<i>Saccharum officinarum</i>	Poales	NC_006084	<i>accD, psbA, ycf1, ycf2</i>
<i>Sorghum bicolor</i>	Poales	NC_008602	<i>accD, ycf1, ycf2</i>
<i>Triticum aestivum</i>	Poales	NC_002762	<i>accD, ycf1, ycf2</i>
<i>Typha latifolia</i>	Poales	NC_013823	
<i>Zea mays</i>	Poales	NC_001666	<i>accD, ycf1, ycf2</i>
<i>Heliconia collinsiana</i>	Zingiberales	NC_020362	
Eudicots (90)			
<i>Brassaiopsis hainla</i>	Apiales	NC_022811	
<i>Daucus carota</i>	Apiales	NC_008325	
<i>Schefflera delavayi</i>	Apiales	NC_022813	
<i>Panax ginseng</i>	Apiales	NC_006290	
<i>Metapanax delavayi</i>	Apiales	NC_022812	
<i>Ilex cornuta</i> Lindl. & Paxton	Aquifoliales	GQ997298-GQ997380	
<i>Guizotia abyssinica</i>	Asterales	NC_010601	
<i>Helianthus annuus</i>	Asterales	NC_007977	
<i>Lactuca sativa</i>	Asterales	NC_007578	<i>ycf1</i>
<i>Artemisia frigida</i>	Asterales	NC_020607	
<i>Trachelium caeruleum</i>	Asterales	NC_010442	<i>accD, clpP, infA, ndhK, rpl23</i>
<i>Jacobaea vulgaris</i>	Asterales	NC_015543	<i>rpoC1</i>

<i>Berberidopsis corallina</i> Hook.f.	Berberidopsidales	EU002158, EU002171, EU002201, EU002274, EU002295, EU002385, EU002466, GQ997932-GQ998004	
<i>Ehretia acuminata</i> R.Br.	Boraginaceae	GQ997215-GQ997297	
<i>Arabidopsis thaliana</i>	Brassicales	NC_000932	<i>infA</i>
<i>Brassica napus</i>	Brassicales	NC_016734	<i>infA</i>
<i>Carica papaya</i>	Brassicales	NC_010323	<i>infA</i>
<i>Buxus microphylla</i>	Buxales	NC_009599	
<i>Fagopyrum esculentum</i>	Caryophyllales	NC_010776	<i>rpl23</i>
<i>Spinacia oleracea</i>	Caryophyllales	NC_002202	<i>rpl23</i>
<i>Silene conica</i>	Caryophyllales	NC_016729	<i>infA, matK, rpl23</i>
<i>Euonymus americanus</i> L.	Celastrales	EU002160, EU002170, EU002193, EU002277, EU002321, EU002409, EU002500, GQ998147-GQ998219	
<i>Cornus florida</i> L.	Cornales	EU002157, EU002175, EU002215, EU002276, EU002311, EU002377, EU002491, GQ998074-GQ998146	<i>psbT</i>
<i>Staphylea</i>	Crossosomatales	EU002168,	<i>infA</i>

<i>colchica</i> Steven		EU002189, EU002261, EU002285, EU002364, EU002453, EU002543, GQ998725-GQ998796	
<i>Cucumis sativus</i>	Cucurbitales	NC_007144	<i>infA</i>
<i>Corynocarpus laevigata</i>	Cucurbitales	NC_014807	<i>infA, ndhD</i>
<i>Dillenia indica</i> L	Dilleniaceae	GQ997132-GQ997214	
<i>Lonicera japonica</i> Thunb.	Dipsacales	GQ997381-GQ997463	
<i>Rhododendron simsii</i> Planch	Ericales	GQ997782-GQ997859	<i>accD, clpP, rpl33, ycf1, ycf2</i>
<i>Cicer arietinum</i>	Fabales	NC_011163	<i>infA, rpl22, rps16, ycf4</i>
<i>Glycine max</i>	Fabales	NC_007942	<i>infA, rpl22, ycf4</i>
<i>Millettia pinnata</i>	Fabales	NC_016708	<i>infA, rpl22</i>
<i>Lotus japonicus</i>	Fabales	NC_002694	<i>infA, rpl22</i>
<i>Phaseolus vulgaris</i>	Fabales	NC_009259	<i>infA, rpl22, rpl33, rps16</i>
<i>Trifolium subterraneum</i>	Fabales	NC_011828	<i>accD, infA, ndhB, ndhK, rpl22, rpl32, rps16, rps18, ycf1, ycf4</i>
<i>Castanea mollissima</i>	Fagales	NC_014674	<i>infA, rpl22</i>
<i>Aucuba japonica</i> Thunb.	Garryales	GQ997049-GQ997131	
<i>Coffea arabica</i>	Gentianales	NC_008535	
<i>Asclepias syriaca</i>	Gentianales	NC_022432	<i>accD, clpP</i>
<i>Catharanthus roseus</i>	Gentianales	NC_021423	
<i>Erodium texanum</i>	Geraniales	NC_014569	<i>accD, infA, ycf1, ycf2</i>
<i>Geranium palmatum</i>	Geraniales	NC_014573	<i>clpP, infA, ycf1, ycf2</i>
<i>Monsonia speciosa</i>	Geraniales	NC_014582	<i>accD, clpP, infA, rps12, ycf1, ycf2</i>
<i>Pelargonium x hortorum</i>	Geraniales	NC_008454	<i>accD, infA, rpoA</i>
<i>Gunnera manicata</i> Linden	Gunnerales	EU002162, EU002179, EU002226,	<i>psbH</i>

		EU002279, EU002325, EU002413, EU002504, GQ998292-GQ998364	
<i>Boea hygrometrica</i>	Lamiales	NC_016468	<i>cemA, psbB, psbI, psbZ, rps19</i>
<i>Salvia multiorrhiza</i>	Lamiales	NC_020431	
<i>Utricularia gibba</i>	Lamiales	NC_021449	<i>petD</i>
<i>Olea woodiana</i> <i>subsp. woodiana</i>	Lamiales	NC_015608	<i>ccsA, cemA, infA, ndhK, psbZ, rps12</i>
<i>Jasminum nudiflorum</i>	Lamiales	NC_008407	<i>accD</i>
<i>Cistanche deserticola</i>	Lamiales	NC_021111	<i>accD, atpA, atpB, atpE, atpF, atpH, atpI, ccsA, cemA, ndhA, ndhB, ndhC, ndhD, ndhE, ndhF, ndhG, ndhH, ndhI, ndhJ, ndhK, petA, petB, petD, petG, petL, petN, psaA, psbA, psbB, psbC, psbD, psbE, psbF, psbH, psbI, psbJ, psbK, psbL, psbN, psbT, psbZ, rbcL, rpl23, rpoA, rpoB, rpoC1, rpoC2, ycf1, ycf3, ycf4</i>
<i>Epifagus virginiana</i>	Lamiales	NC_001568	<i>atpA, atpB, atpE, atpF, atpH, atpI, ccsA, cemA, ndhA, ndhB, ndhC, ndhD, ndhE, ndhF, ndhG, ndhH, ndhI, ndhJ, ndhK, petA, petB, petD, petG, petL, petN, psaA, psbA, psbB, psbC, psbD, psbE, psbF, psbH, psbI, psbJ, psbK, psbL, psbM, psbN, psbT, psbZ, rbcL, rpl14, rpl22, rpl23, rpl32, rpoA, rpoB, rpoC1, rpoC2, rps15, rps16, ycf1, ycf3, ycf4</i>
<i>Lindenbergia philippensis</i>	Lamiales	NC_022859	<i>accD, matK, ndhF, ndhK, psbF, psbI, rpoC1, rps15, ycf1</i>
<i>Hevea brasiliensis</i>	Malpighiales	NC_015308	<i>infA</i>
<i>Ricinus communis</i>	Malpighiales	NC_016736	<i>infA</i>
<i>Manihot</i>	Malpighiales	NC_010433	<i>infA</i>

<i>esculenta</i>			
<i>Populus</i>	Malpighiales	NC_009143	<i>infA, rpl32, rps16, ycf1</i>
<i>trichocarpa</i>			
<i>Gossypium</i>	Malvales	NC_007944	<i>infA, rpl22</i>
<i>hirsutum</i>			
<i>Allosyncarpia</i>	Myrtales	NC_022413	<i>infA, psbL</i>
<i>ternata</i>			
<i>Angophora</i>	Myrtales	NC_022412	<i>infA, psbL</i>
<i>costata</i>			
<i>Corymbia eximia</i>	Myrtales	NC_022409	<i>infA, psbL</i>
<i>Stockwellia</i>	Myrtales	NC_022414	<i>infA, psbL</i>
<i>quadrifida</i>			
<i>Eucalyptus</i>	Myrtales	NC_008115	<i>infA, psbL</i>
<i>globulus</i>			
<i>Oenothera elata</i>	Myrtales	NC_002693	<i>infA</i>
<i>Oxalis latifolia</i>	Oxalidales	EU002165,	<i>infA, rpl32, rps16</i>
<i>Kunth</i>		EU002186,	
		EU002248,	
		EU002282,	
		EU002350,	
		EU002438,	
		EU002528,	
		GQ998511-GQ998580	
<i>Platanus</i>	Proteales	NC_008335	
<i>occidentalis</i>			
<i>Nelumbo lutea</i>	Proteales	NC_015605 (in this study)	
<i>Nelumbo</i>	Proteales	NC_015610 (in this study)	
<i>nucifera</i>			
<i>Meliosma aff.</i>	Sabiaceae	GQ997464-GQ997546	
<i>cuneifolia</i>			
<i>Franch.</i>			
<i>Phoradendron</i>	Santalales	GQ997713-GQ997781	<i>infA, ndhA, ndhB, ndhC, ndhD,</i>
<i>leucarpum (Raf.)</i>			<i>ndhE, ndhF, ndhG, ndhH, ndhI,</i>
<i>Reveal &</i>			<i>ndhJ, ndhK, rpl33, rps15</i>
<i>M.C.Johnst.</i>			
<i>Ximenia</i>	Santalales	GQ997860-GQ997931	<i>All ndh genes</i>
<i>americana L</i>			
<i>Heuchera</i>	Saxifragales	EU002163,	
<i>sanguinea Engelm</i>		EU002180,	
		EU002228,	
		EU002280,	
		EU002327,	

		EU002415, EU002506, GQ998365-GQ998437	
<i>Ranunculus macranthus</i>	Ranunculales	NC_008796	<i>infA</i>
<i>Berberis bealei</i>	Ranunculales	NC_022457	<i>psbZ, rpoA</i>
<i>Nandina domestica</i>	Ranunculales	NC_008336	
<i>Megaleranthis saniculifolia</i>	Ranunculales	NC_012615	
<i>Morus indica</i>	Rosales	NC_008359	<i>infA</i>
<i>Fragaria chiloensis</i>	Rosales	NC_019601	<i>infA</i>
<i>Prunus persica</i>	Rosales	NC_014697	<i>infA</i>
<i>Citrus sinensis</i>	Sapindales	NC_008334	<i>infA</i>
<i>Atropa belladonna</i>	Solanales	NC_004561	<i>infA</i>
<i>Cuscuta exaltata</i>	Solanales	NC_009963	<i>infA, ndhA, ndhB, ndhC, ndhD, ndhE, ndhF, ndhG, ndhH, ndhI, ndhJ, ndhK, rpl23, rps16</i>
<i>Capsicum annuum</i>	Solanales	NC_018552	<i>infA</i>
<i>Solanum bulbocastanum</i>	Solanales	NC_007943	
<i>Ipomoea purpurea</i>	Solanales	NC_009808	<i>infA</i>
<i>Nicotiana tabacum</i>	Solanales	NC_001879	<i>infA</i>
<i>Trochodendron aralioides</i>	Trochodendrales	NC_021426	
<i>Tetracentron sinense</i>	Trochodendrales	NC_021425	
<i>Vitis vinifera</i>	Vitales	NC_007957	
<i>Bulnesia arborea (Jacq.) Engl</i>	Zygophyllales	EU002159, EU002172, EU002205, EU002275, EU002299, EU002388, EU002478, GQ998005-GQ998073	<i>infA, rps16, ycf1, ycf2</i>
