Table S1. The *ndh* status of 743 plastomes.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Orders | Species | Accession | *ndhA* | *ndhB* | *ndhC* | *ndhD* | *ndhE* | *ndhF* | *ndhG* | *ndhH* | *ndhI* | *ndhJ* | *ndhK* |
| Amborellales | *Amborella trichopoda* | NC\_005086 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Nymphaeales | *Nuphar advena* | NC\_008788 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Nymphaeales | *Nymphaea alba* | NC\_006050 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Nymphaeales | *Nymphaea mexicana* | NC\_024542 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Nymphaeales | *Trithuria inconspicua* | NC\_020372 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Austrobaileyales | *Illicium oligandrum* | NC\_009600 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Chloranthales | *Chloranthus japonicus* | NC\_026565 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Chloranthales | *Chloranthus spicatus* | NC\_009598 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Canellales | *Drimys granadensis* | NC\_008456 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Laurales | *Calycanthus floridus* var*. glaucus* | NC\_004993 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Laurales | *Machilus balansae* | NC\_028074 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Laurales | *Machilus yunnanensis* | NC\_028073 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Magnoliales | *Liriodendron tulipifera* | NC\_008326 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Magnoliales | *Magnolia denudata* | NC\_018357 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Magnoliales | *Magnolia grandiflora* | NC\_020318 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Magnoliales | *Magnolia kwangsiensis* | NC\_015892 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Magnoliales | *Magnolia officinalis* | NC\_020316 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Magnoliales | *Magnolia officinalis* subsp*. biloba* | NC\_020317 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Magnoliales | *Magnolia tripetala* | NC\_024027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Magnoliales | *Magnolia yunnanensis* | NC\_024545 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Piperales | *Piper cenocladum* | NC\_008457 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Piperales | *Piper kadsura* | NC\_027941 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ceratophyllales | *Ceratophyllum demersum* | NC\_009962 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Acorales | *Acorus americanus* | NC\_010093 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Acorales | *Acorus calamus* | NC\_007407 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Acorales | *Acorus gramineus* | NC\_026299 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Alismatales | *Colocasia esculenta* | NC\_016753 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Alismatales | *Dieffenbachia seguine* | NC\_027272 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Alismatales | *Elodea canadensis* | NC\_018541 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Alismatales | *Epipremnum aureum* | NC\_027954 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Alismatales | *Lemna minor* | NC\_010109 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Alismatales | *Najas flexilis* | NC\_021936 | 4 | 2 | 2 | 3 | 2 | 4 | 4 | 3 | 4 | 4 | 4 |
| Alismatales | *Pinellia ternata* | NC\_027681 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Alismatales | *Spirodela polyrhiza* | NC\_015891 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Alismatales | *Wolffia australiana* | NC\_015899 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Alismatales | *Wolffiella lingulata* | NC\_015894 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Petrosaviales | *Petrosavia stellaris* | NC\_023356 | 3 | 2 | 3 | 3 | 3 | 4 | 3 | 2 | 4 | 4 | 4 |
| Dioscoreales | *Dioscorea elephantipes* | NC\_009601 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Dioscoreales | *Dioscorea rotundata* | NC\_024170 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Dioscoreales | *Dioscorea zingiberensis* | NC\_027090 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Pandanales | *Carludovica palmata* | NC\_026786 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Pandanales | *Sciaphila densiflora* | NC\_027659 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Liliales | *Alstroemeria aurea* | KC968976 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Bomarea edulis* | NC\_025306 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Campynema lineare* | NC\_026785 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Fritillaria cirrhosa* | NC\_024728 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Fritillaria hupehensis* | NC\_024736 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Fritillaria taipaiensis* | NC\_023247 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Heloniopsis tubiflora* | NC\_027159 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Lilium hansonii* | NC\_027674 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Lilium longiflorum* | KC968977 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Lilium sp.* | NC\_027679 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Lilium superbum* | NC\_026787 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Lilium tsingtauense* | NC\_027675 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Luzuriaga radicans* | NC\_025333 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Paris verticillata* | NC\_024560 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Smilax china* | HM536959 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Trillium cuneatum* | NC\_027185 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Trillium decumbens* | NC\_027282 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Trillium maculatum* | NC\_027738 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Trillium tschonoskii* | NC\_027739 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Veratrum patulum* | NC\_022715 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Liliales | *Xerophyllum tenax* | NC\_027158 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Allium cepa* | NC\_024813 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Bletilla ochracea* | NC\_029483 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 |
| Asparagales | *Bletilla striata* | NC\_028422 | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 3 | 2 | 1 | 3 |
| Asparagales | *Calanthe triplicata* | NC\_024544 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Cattleya crispata* | NC\_026568 | 4 | 2 | 1 | 2 | 1 | 4 | 3 | 3 | 4 | 3 | 3 |
| Asparagales | *Corallorhiza bulbosa* | NC\_025659 | 3 | 3 | 2 | 2 | 4 | 4 | 4 | 2 | 2 | 1 | 3 |
| Asparagales | *Corallorhiza macrantha* | NC\_025660 | 3 | 3 | 2 | 2 | 4 | 4 | 4 | 2 | 2 | 2 | 2 |
| Asparagales | *Corallorhiza mertensiana* | NC\_025661 | 3 | 3 | 2 | 2 | 4 | 4 | 3 | 3 | 2 | 2 | 2 |
| Asparagales | *Corallorhiza odontorhiza* | NC\_025664 | 3 | 3 | 2 | 2 | 4 | 4 | 3 | 3 | 2 | 4 | 3 |
| Asparagales | *Corallorhiza striata* var*. vreelandii* | JX087681 | 3 | 2 | 2 | 3 | 3 | 4 | 2 | 4 | 2 | 2 | 3 |
| Asparagales | *Corallorhiza trifida* | NC\_025662 | 3 | 2 | 2 | 3 | 4 | 4 | 3 | 2 | 3 | 3 | 3 |
| Asparagales | *Corallorhiza wisteriana* | NC\_025663 | 3 | 2 | 2 | 3 | 4 | 4 | 3 | 3 | 2 | 4 | 3 |
| Asparagales | *Cymbidium aloifolium* | NC\_021429 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 2 |
| Asparagales | *Cymbidium ensifolium* 1 | KU179434 | 3 | 2 | 1 | 2 | 1 | 4 | 2 | 4 | 1 | 4 | 2 |
| Asparagales | *Cymbidium ensifolium* 2 | NC\_028525 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| Asparagales | *Cymbidium faberi* | NC\_027743 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| Asparagales | *Cymbidium goeringii* | NC\_028524 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 |
| Asparagales | *Cymbidium kanran* | KU179435 | 3 | 2 | 1 | 2 | 1 | 4 | 2 | 4 | 1 | 1 | 2 |
| Asparagales | *Cymbidium lancifolium* | KU179436 | 3 | 2 | 1 | 2 | 2 | 4 | 2 | 4 | 2 | 2 | 2 |
| Asparagales | *Cymbidium macrorhizon* | KU179437 | 3 | 2 | 1 | 2 | 2 | 4 | 2 | 4 | 2 | 2 | 2 |
| Asparagales | *Cymbidium mannii* | NC\_021433 | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 3 | 1 | 1 | 2 |
| Asparagales | *Cymbidium sinense* | NC\_021430 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| Asparagales | *Cymbidium tortisepalum* | NC\_021431 | 2 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| Asparagales | *Cymbidium tracyanum* | NC\_021432 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 |
| Asparagales | *Cypripedium formosanum* | NC\_026772 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Cypripedium japonicum* | NC\_027227 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Cypripedium macranthos* | NC\_024421 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Dendrobium catenatum* | NC\_024019 | 3 | 1 | 4 | 3 | 1 | 3 | 3 | 2 | 4 | 2 | 4 |
| Asparagales | *Dendrobium chrysotoxum* | NC\_028549 | 3 | 1 | 4 | 3 | 1 | 3 | 3 | 1 | 4 | 1 | 4 |
| Asparagales | *Dendrobium huoshanense* | NC\_028430 | 3 | 1 | 4 | 3 | 2 | 3 | 3 | 2 | 4 | 2 | 4 |
| Asparagales | *Dendrobium nobile* | NC\_029456 | 3 | 1 | 4 | 3 | 2 | 3 | 3 | 2 | 4 | 2 | 4 |
| Asparagales | *Dendrobium pendulum* | NC\_029705 | 3 | 1 | 4 | 3 | 1 | 3 | 3 | 1 | 4 | 1 | 3 |
| Asparagales | *Dendrobium strongylanthum* | NC\_027691 | 3 | 1 | 4 | 3 | 1 | 3 | 3 | 1 | 4 | 2 | 3 |
| Asparagales | *Elleanthus sodiroi* | NC\_027266 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Epipogium aphyllum* | NC\_026449 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Asparagales | *Epipogium roseum* | NC\_026448 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Asparagales | *Erycina pusilla* | NC\_018114 | 4 | 3 | 2 | 3 | 3 | 4 | 3 | 3 | 4 | 3 | 3 |
| Asparagales | *Eustrephus latifolius* | NC\_025305 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Goodyera fumata* | NC\_026773 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Goodyera procera* | NC\_029363 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Goodyera schlechtendaliana* | NC\_029364 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Goodyera velutina* | NC\_029365 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Habenaria pantlingiana* | NC\_026775 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Iris gatesii* | NC\_024936 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Supplementary table S1. Continue

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Order | Species | Accession | *ndhA* | *ndhB* | *ndhC* | *ndhD* | *ndhE* | *ndhF* | *ndhG* | *ndhH* | *ndhI* | *ndhJ* | *ndhK* |
| Asparagales | *Masdevallia coccinea* | NC\_026541 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Masdevallia picturata* | NC\_026777 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Neottia nidus-avis* | NC\_016471 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 4 |
| Asparagales | *Oncidium* Gower Ramsey | NC\_014056 | 3 | 2 | 2 | 3 | 1 | 4 | 2 | 3 | 3 | 3 | 3 |
| Asparagales | *Oncidium sphacelatum* | NC\_028148 | 3 | 2 | 2 | 3 | 1 | 4 | 2 | 3 | 3 | 3 | 3 |
| Asparagales | *Paphiopedilum armeniacum* | NC\_026779 | 4 | 2 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | 2 |
| Asparagales | *Paphiopedilum niveum* | NC\_026776 | 4 | 2 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | 2 |
| Asparagales | *Phalaenopsis aphrodite* subsp*. formosana* | NC\_007499 | 4 | 2 | 2 | 3 | 3 | 4 | 3 | 4 | 3 | 2 | 3 |
| Asparagales | *Phalaenopsis equestris* | NC\_017609 | 4 | 2 | 2 | 3 | 4 | 4 | 3 | 4 | 3 | 2 | 3 |
| Asparagales | *Phalaenopsis* hybrid cultivar | NC\_025593 | 4 | 2 | 2 | 3 | 3 | 4 | 3 | 4 | 3 | 2 | 3 |
| Asparagales | *Phragmipedium longifolium* | NC\_028149 | 3 | 3 | 4 | 2 | 4 | 4 | 4 | 4 | 3 | 2 | 3 |
| Asparagales | *Polygonatum cyrtonema* | NC\_028429 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Polygonatum verticillatum* | NC\_028523 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Rhizanthella gardneri* | NC\_014874 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 |
| Asparagales | *Sobralia aff. bouchei* | NC\_028209 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Sobralia callosa* | NC\_028147 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asparagales | *Vanilla planifolia* | NC\_026778 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Commelinids incertae sedis | *Dasypogon bromeliifolius* | NC\_020367 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Arecales | *Bismarckia nobilis* | NC\_020366 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Arecales | *Calamus caryotoides* | NC\_020365 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Arecales | *Cocos nucifera* | NC\_022417 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Arecales | *Colpothrinax cookii* | NC\_028026 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Arecales | *Elaeis guineensis* | NC\_017602 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Arecales | *Phoenix dactylifera* | NC\_013991 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Arecales | *Podococcus barteri* | NC\_027276 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Arecales | *Pseudophoenix vinifera* | NC\_020364 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Arecales | *Sabal domingensis* | NC\_026444 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Acidosasa purpurea* | NC\_015820 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Aegilops bicornis* | NC\_024831 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Aegilops cylindrica* | NC\_023096 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Aegilops geniculata* | NC\_023097 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Aegilops kotschyi* | NC\_024832 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Aegilops longissima* | NC\_024830 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Aegilops searsii* | NC\_024815 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Aegilops sharonensis* | NC\_024816 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Aegilops speltoides* | NC\_022135 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Aegilops tauschii* | NC\_022133 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Agrostis stolonifera* | NC\_008591 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Alloteropsis angusta* | NC\_027951 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Alloteropsis cimicina* | NC\_027952 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Alloteropsis semialata* | NC\_027824 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Ammophila breviligulata* | NC\_027465 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Ampelocalamus calcareus* | NC\_024731 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Ampelodesmos mauritanicus* | NC\_027466 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Ananas comosus* | NC\_026220 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Anomochloa marantoidea* | NC\_014062 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Anthoxanthum nitens* | NC\_027475 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Anthoxanthum odoratum* | NC\_027467 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Aristida purpurea* | NC\_025228 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Arundinaria appalachiana* | NC\_023934 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Arundinaria fargesii* | NC\_024712 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Arundinaria gigantea* | NC\_020341 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Arundinaria tecta* | NC\_023935 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Avena sativa* | NC\_027468 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Bambusa arnhemica* | NC\_026958 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Bambusa bambos* | NC\_026957 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Bambusa emeiensis* | NC\_015830 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Bambusa multiplex* | NC\_024668 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Brachyelytrum aristosum* | NC\_027470 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Brachypodium distachyon* | NC\_011032 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Briza maxima* | NC\_027471 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Bromus vulgaris* | NC\_027472 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Buergersiochloa bambusoides* | NC\_026968 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Carex siderosticta* | NC\_027250 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Cenchrus americanus* | NC\_024171 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Centotheca lappacea* | NC\_025229 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Chikusichloa aquatica* | NC\_027184 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Chimonocalamus longiusculus* | NC\_024714 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Chionochloa macra* | NC\_025230 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Chusquea circinata* | NC\_027490 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Chusquea liebmannii* | NC\_026969 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Chusquea spectabilis* | NC\_026959 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Coix lacryma-jobi* | NC\_013273 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Coleataenia prionitis* | NC\_025231 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Dactylis glomerata* | NC\_027473 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Danthonia californica* | NC\_025232 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Dendrocalamus latiflorus* | NC\_013088 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Deschampsia antarctica* | NC\_023533 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Diandrolyra* sp. | NC\_026960 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Diarrhena obovata* | NC\_027474 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Digitaria exilis* | NC\_024176 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Echinochloa crus-galli* | NC\_028719 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Echinochloa oryzicola* | NC\_024643 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Elytrophorus spicatus* | NC\_025233 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Eriachne stipacea* | NC\_025234 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Fargesia nitida* | NC\_024715 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Fargesia spathacea* | NC\_024716 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Fargesia yunnanensis* | NC\_024717 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Ferrocalamus rimosivaginus* | NC\_015831 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Festuca altissima* | NC\_019648 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Festuca arundinacea* | NC\_011713 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Festuca ovina* | NC\_019649 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Festuca pratensis* | NC\_019650 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Gaoligongshania megalothyrsa* | NC\_024718 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Gelidocalamus tessellatus* | NC\_024719 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Greslania* sp. | NC\_026961 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Guadua weberbaueri* | NC\_026991 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Hakonechloa macra* | NC\_025235 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Helictochloa hookeri* | NC\_027469 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Hickelia madagascariensis* | NC\_026962 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Hordeum jubatum* | NC\_027476 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Hordeum vulgare* subsp*. vulgare* | NC\_008590 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Indocalamus longiauritus* | NC\_015803 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Indocalamus wilsonii* | NC\_024720 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Indosasa sinica* | NC\_024721 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Isachne distichophylla* | NC\_025236 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Lecomtella madagascariensis* | NC\_024106 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Supplementary table S1. Continues

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Order | Species | Accession | *ndhA* | *ndhB* | *ndhC* | *ndhD* | *ndhE* | *ndhF* | *ndhG* | *ndhH* | *ndhI* | *ndhJ* | *ndhK* |
| Poales | *Leersia tisserantii* | NC\_016677 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Lithachne pauciflora* | NC\_026970 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Lolium multiflorum* | NC\_019651 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Lolium perenne* | NC\_009950 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Melica mutica* | NC\_027477 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Melica subulata* | NC\_027478 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Miscanthus sacchariflorus* | NC\_028720 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Miscanthus sinensis* | NC\_028721 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Monachather paradoxus* | NC\_025237 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Neohouzeaua* sp | NC\_026963 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Neololeba atra* | NC\_026964 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Neyraudia reynaudiana* | NC\_024262 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oligostachyum shiuyingianum* | NC\_024722 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Olmeca reflexa* | NC\_026965 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Olyra latifolia* | NC\_024165 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza australiensis* | NC\_024608 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza barthii* | NC\_027460 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza glaberrima* | NC\_024175 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza glumipatula* | NC\_027461 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza longistaminata* | NC\_027462 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza meridionalis* | NC\_016927 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza nivara* | NC\_005973 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza officinalis* | NC\_027463 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza punctata* | NC\_027676 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza rufipogon* | NC\_017835 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza sativa* Indica Group 1 | NC\_027678 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza sativa* Indica Group 2 | NC\_008155 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryza sativa* Japonica Group | NC\_001320 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Oryzopsis asperifolia* | NC\_027479 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Otatea acuminata* | NC\_026971 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Otatea glauca* | NC\_028631 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Panicum virgatum* | NC\_015990 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Pariana campestris* | NC\_027491 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Pariana radiciflora* | NC\_026972 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Phaenosperma globosum* | NC\_027480 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Phalaris arundinacea* | NC\_027481 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Pharus lappulaceus* | NC\_023245 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Pharus latifolius* | NC\_021372 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Phleum alpinum* | NC\_027482 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Phragmites australis* | NC\_022958 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Phyllostachys edulis* | NC\_015817 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Phyllostachys nigra* var*. henonis* | NC\_015826 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Phyllostachys propinqua* | NC\_016699 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Phyllostachys sulphurea* | NC\_024669 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Piptochaetium avenaceum* | NC\_027483 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Pleioblastus maculatus* | NC\_024723 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Poa palustris* | NC\_027484 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Pseudosasa japonica* | NC\_028328 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Puccinellia nuttalliana* | NC\_027485 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Puelia olyriformis* | NC\_023449 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Raddia brasiliensis* | NC\_026966 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Rhynchoryza subulata* | NC\_016718 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Saccharum* hybrid cultivar NCo 310 | NC\_006084 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Saccharum* hybrid cultivar SP80-3280 | NC\_005878 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Sarocalamus faberi* | NC\_024713 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Sartidia dewinteri* | NC\_027147 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Sartidia perrieri* | NC\_027146 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Secale cereale* | NC\_021761 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Setaria italica* | NC\_022850 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Setaria viridis* | NC\_028075 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Sorghum bicolor* | NC\_008602 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Sorghum timorense* | NC\_023800 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Sporobolus maritimus* | NC\_027650 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Stipa hymenoides* | NC\_027464 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Stipa lipskyi* | NC\_028444 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Thamnocalamus spathiflorus* | NC\_024724 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Thysanolaena latifolia* | NC\_025238 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Torreyochloa pallida* | NC\_027486 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Trisetum cernuum* | NC\_027487 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Triticum aestivum* | NC\_002762 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Triticum macha* | NC\_025955 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Triticum monococcum* | NC\_021760 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Triticum timopheevii* | NC\_024764 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Triticum turgidum* | NC\_024814 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Triticum urartu* | NC\_021762 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Typha latifolia* | NC\_013823 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Yushania levigata* | NC\_024725 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Zea mays* | NC\_001666 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Poales | *Zizania aquatica* | NC\_026967 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Zingiberales | *Curcuma flaviflora* | NC\_028729 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Zingiberales | *Curcuma roscoeana* | NC\_022928 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Zingiberales | *Heliconia collinsiana* | NC\_020362 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Zingiberales | *Musa balbisiana* | NC\_028439 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Zingiberales | *Musa textilis* | NC\_022926 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Zingiberales | *Ravenala madagascariensis* | NC\_022927 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Zingiberales | *Zingiber spectabile* | NC\_020363 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ranunculales | *Berberis bealei* | NC\_022457 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ranunculales | *Clematis terniflora* | NC\_028000 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ranunculales | *Megaleranthis saniculifolia* | NC\_012615 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ranunculales | *Nandina domestica* | NC\_008336 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ranunculales | *Ranunculus macranthus* | NC\_008796 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ranunculales | *Sinopodophyllum hexandrum* | NC\_027732 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ranunculales | *Thalictrum coreanum* | NC\_026103 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Proteales | *Macadamia integrifolia* | NC\_025288 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Proteales | *Nelumbo lutea* | NC\_015605 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Proteales | *Nelumbo nucifera* | NC\_025339 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Proteales | *Platanus occidentalis* | NC\_008335 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Trochodendrales | *Tetracentron sinense* | NC\_021425 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Trochodendrales | *Trochodendron aralioides* | NC\_021426 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Buxales | *Buxus microphylla* | NC\_009599 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Saxifragales | *Liquidambar formosana* | NC\_023092 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Saxifragales | *Paeonia obovata* | NC\_026076 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Saxifragales | *Penthorum chinense* | NC\_023086 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Saxifragales | *Sedum oryzifolium* | NC\_027837 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Saxifragales | *Sedum sarmentosum* | NC\_023085 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Saxifragales | *Sedum takesimense* | NC\_026065 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Vitales | *Vitis rotundifolia* | NC\_023790 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Supplementary table S1. Continues

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Order | Species | Accession | *ndhA* | *ndhB* | *ndhC* | *ndhD* | *ndhE* | *ndhF* | *ndhG* | *ndhH* | *ndhI* | *ndhJ* | *ndhK* |
| Vitales | *Vitis vinifera* | NC\_007957 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Zygophyllales | *Larrea tridentata* | NC\_028023 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Celastrales | *Euonymus japonicus* | NC\_028067 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Chrysobalanus icaco* | NC\_024061 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Couepia guianensis* | NC\_024063 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Hevea brasiliensis* | NC\_015308 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Hirtella physophora* | NC\_024066 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Hirtella racemosa* | NC\_024060 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Jatropha curcas* | NC\_012224 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Licania alba* | NC\_024064 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Licania heteromorpha* | NC\_024062 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Licania sprucei* | NC\_024065 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Manihot esculenta* | NC\_010433 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Parinari campestris* | NC\_024067 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Populus alba* | NC\_008235 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Populus balsamifera* | NC\_024735 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Populus euphratica* | NC\_024747 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Populus fremontii* | NC\_024734 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Populus tremula* | NC\_027425 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Populus tremula x Populus alba* | NC\_028504 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Populus trichocarpa* | NC\_009143 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Ricinus communis* | NC\_016736 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Salix babylonica* | NC\_028350 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Salix interior* | NC\_024681 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Salix purpurea* | NC\_026722 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Salix suchowensis* | NC\_026462 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malpighiales | *Viola seoulensis* | NC\_026986 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Acacia ligulata* | NC\_026134 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Astragalus nakaianus* | NC\_028171 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Cicer arietinum* | NC\_011163 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Glycine canescens* | NC\_021647 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Glycine cyrtoloba* | NC\_021645 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Glycine dolichocarpa* | NC\_021648 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Glycine falcata* | NC\_021649 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Glycine max* | NC\_007942 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Glycine soja* | NC\_022868 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Glycine stenophita* | NC\_021646 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Glycine syndetika* | NC\_021650 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Glycine tomentella* | NC\_021636 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Glycyrrhiza glabra* | NC\_024038 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Inga leiocalycina* | NC\_028732 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus clymenum* | NC\_027148 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus davidii* | NC\_027073 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus graminifolius* | NC\_027074 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus inconspicuus* | NC\_027149 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus japonicus* | NC\_027075 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus littoralis* | NC\_027076 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus ochroleucus* | NC\_027077 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus odoratus* | NC\_027150 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus palustris* | NC\_027078 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus pubescens* | NC\_027079 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus sativus* | NC\_014063 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus tingitanus* | NC\_027151 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lathyrus venosus* | NC\_027080 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lens culinaris* | NC\_027152 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Leucaena trichandra* | NC\_028733 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lotus japonicus* | NC\_002694 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Lupinus luteus* | NC\_023090 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Medicago hybrida* | NC\_027153 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Medicago papillosa* | NC\_027154 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Medicago truncatula* | NC\_003119 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Millettia pinnata* | NC\_016708 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Phaseolus vulgaris* | NC\_009259 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Pisum sativum* | NC\_014057 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Trifolium aureum* | NC\_024035 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Trifolium boissieri* | NC\_025743 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Trifolium glanduliferum* | NC\_025744 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Trifolium grandiflorum* | NC\_024034 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Trifolium meduseum* | NC\_024166 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Trifolium repens* | NC\_024036 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Trifolium strictum* | NC\_025745 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Trifolium subterraneum* | NC\_011828 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Vicia sativa* | NC\_027155 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Vigna angularis* | NC\_021091 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Vigna radiata* | NC\_013843 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Vigna unguiculata* | NC\_018051 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fabales | *Wisteria floribunda* | NC\_027677 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Cannabis sativa* 1 | NC\_027223 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Cannabis sativa* 2 | NC\_026562 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Elaeagnus macrophylla* | NC\_028066 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Ficus racemosa* | NC\_028185 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Fragaria chiloensis* | NC\_019601 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Fragaria iinumae* | NC\_024258 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Fragaria mandshurica* | NC\_018767 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Fragaria vesca* subsp*. bracteata* | NC\_018766 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Fragaria vesca* subsp*. vesca* | NC\_015206 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Fragaria virginiana* | NC\_019602 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Humulus lupulus* | NC\_028032 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Morus indica* | NC\_008359 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Morus mongolica* | NC\_025772 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Morus notabilis* | NC\_027110 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Pentactina rupicola* | NC\_016921 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Prinsepia utilis* | NC\_021455 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Prunus kansuensis* | NC\_023956 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Prunus maximowiczii* | NC\_026981 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Prunus mume* | NC\_023798 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Prunus padus* | NC\_026982 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Prunus persica* | NC\_014697 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Prunus yedoensis* | NC\_026980 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Pyrus pyrifolia* | NC\_015996 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Rosales | *Pyrus spinosa* | NC\_023130 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Cucurbitales | *Corynocarpus laevigata* | NC\_014807 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Cucurbitales | *Cucumis hystrix* | NC\_023544 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Cucurbitales | *Cucumis melo* subsp*. melo* | NC\_015983 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Cucurbitales | *Cucumis sativus* | NC\_007144 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fagales | *Castanea mollissima* | NC\_014674 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fagales | *Castanopsis echinocarpa* | NC\_023801 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Supplementary table S1. Continues

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Order | Species | Accession | *ndhA* | *ndhB* | *ndhC* | *ndhD* | *ndhE* | *ndhF* | *ndhG* | *ndhH* | *ndhI* | *ndhJ* | *ndhK* |
| Fagales | *Juglans regia* | NC\_028617 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fagales | *Lithocarpus balansae* | NC\_026577 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fagales | *Ostrya rehderiana* | NC\_028349 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fagales | *Quercus aliena* | NC\_026790 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fagales | *Quercus aquifolioides* | NC\_026913 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fagales | *Quercus rubra* | NC\_020152 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fagales | *Quercus spinosa* | NC\_026907 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fagales | *Trigonobalanus doichangensis* | NC\_023959 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Erodium absinthoides* | NC\_026847 | 3 | 2 | 4 | 2 | 4 | 3 | 4 | 4 | 4 | 2 | 4 |
| Geraniales | *Erodium carvifolium* | NC\_015083 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Erodium chrysanthum* | NC\_027065 | 3 | 2 | 4 | 2 | 4 | 3 | 4 | 4 | 4 | 2 | 4 |
| Geraniales | *Erodium crassifolium* | NC\_025906 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Erodium gruinum* | NC\_025907 | 3 | 2 | 2 | 2 | 4 | 2 | 4 | 4 | 4 | 2 | 2 |
| Geraniales | *Erodium texanum* | NC\_014569 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Erodium trifolium* | NC\_024635 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Francoa sonchifolia* | NC\_021101 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| Geraniales | *Geranium palmatum* | NC\_014573 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Hypseocharis bilobata* | NC\_023260 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Melianthus villosus* | NC\_023256 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 |
| Geraniales | *Monsonia speciosa* | NC\_014582 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Pelargonium alternans* | NC\_023261 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Pelargonium australe* | NC\_028053 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Pelargonium cotyledonis* | NC\_028052 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Pelargonium dichondrifolium* | NC\_028051 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Pelargonium x hortorum* | NC\_008454 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Geraniales | *Viviania marifolia* | NC\_023259 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Allosyncarpia ternata* | NC\_022413 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Angophora costata* | NC\_022412 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Angophora floribunda* | NC\_022411 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Corymbia eximia* | NC\_022409 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Corymbia gummifera* | NC\_022407 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Corymbia henryi* | NC\_028409 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Corymbia maculata* | NC\_022408 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Corymbia tessellaris* | NC\_022410 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Corymbia torelliana* | NC\_028410 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus aromaphloia* | NC\_022396 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus baxteri* | NC\_022382 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus camaldulensis* | NC\_022398 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus cladocalyx* | NC\_022394 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus cloeziana* | NC\_022388 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus curtisii* | NC\_022391 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus deglupta* | NC\_022399 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus delegatensis* | NC\_022380 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus diversicolor* | NC\_022402 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus diversifolia* | NC\_022383 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus elata* | NC\_022385 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus erythrocorys* | NC\_022406 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus globulus* subsp*. globulus* | NC\_008115 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus grandis* | NC\_014570 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus guilfoylei* | NC\_022405 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus marginata* | NC\_022390 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus melliodora* | NC\_022392 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus microcorys* | NC\_022404 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus nitens* | NC\_022395 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus obliqua* | NC\_022378 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus patens* | NC\_022389 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus polybractea* | NC\_022393 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus radiata* | NC\_022379 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus regnans* | NC\_022386 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus saligna* | NC\_022397 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus salmonophloia* | NC\_022403 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus sieberi* | NC\_022384 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus spathulata* | NC\_022400 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus torquata* | NC\_022401 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus umbra* | NC\_022387 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eucalyptus verrucata* | NC\_022381 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Eugenia uniflora* | NC\_027744 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Oenothera argillicola* | NC\_010358 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Oenothera biennis* | NC\_010361 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Oenothera elata* subsp*. hookeri* | NC\_002693 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Oenothera glazioviana* | NC\_010360 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Oenothera parviflora* | NC\_010362 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Myrtales | *Stockwellia quadrifida* | NC\_022414 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Sapindales | *Azadirachta indica* | NC\_023792 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Sapindales | *Citrus aurantiifolia* | NC\_024929 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Sapindales | *Citrus sinensis* | NC\_008334 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Sapindales | *Sapindus mukorossi* | NC\_025554 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Sapindales | *Zanthoxylum piperitum* | NC\_027939 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium anomalum* | NC\_023213 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium arboreum* | NC\_016712 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium areysianum* | NC\_018112 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium barbadense* | NC\_008641 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium bickii* | NC\_023214 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium capitis-viridis* | NC\_018111 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium darwinii* | NC\_016670 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium gossypioides* | NC\_017894 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium herbaceum* | NC\_023215 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium herbaceum* subsp*. africanum* | NC\_016692 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium hirsutum* | NC\_007944 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium incanum* | NC\_018109 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium longicalyx* | NC\_023216 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium mustelinum* | NC\_016711 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium raimondii* | NC\_016668 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium robinsonii* | NC\_018113 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium somalense* | NC\_018110 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium stocksii* | NC\_023217 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium sturtianum* | NC\_023218 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium thurberi* | NC\_015204 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium tomentosum* | NC\_016690 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Gossypium turneri* | NC\_026835 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Hibiscus syriacus* | NC\_026909 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Theobroma cacao* | NC\_014676 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Tilia amurensis* | NC\_028588 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Tilia mandshurica* | NC\_028589 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Tilia oliveri* | NC\_028590 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Malvales | *Tilia paucicostata* | NC\_028591 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Aethionema cordifolium* | NC\_009265 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Supplementary table S1. Continue

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Order | Species | Accession | *ndhA* | *ndhB* | *ndhC* | *ndhD* | *ndhE* | *ndhF* | *ndhG* | *ndhH* | *ndhI* | *ndhJ* | *ndhK* |
| Brassicales | *Aethionema grandiflorum* | NC\_009266 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Arabidopsis thaliana* | NC\_000932 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Arabis alpina* | NC\_023367 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Arabis hirsuta* | NC\_009268 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Barbarea verna* | NC\_009269 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Brassica juncea* | NC\_028272 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Brassica napus* | NC\_016734 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Capsella bursa-pastoris* | NC\_009270 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Capsella grandiflora* | NC\_028517 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Capsella rubella* | NC\_027693 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Cardamine impatiens* | NC\_026445 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Cardamine resedifolia* | NC\_026446 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Carica papaya* | NC\_010323 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Crucihimalaya wallichii* | NC\_009271 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Draba nemorosa* | NC\_009272 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Eutrema heterophyllum* | NC\_028728 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Eutrema salsugineum* | NC\_028170 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Eutrema yunnanense* | NC\_028727 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Isatis tinctoria* | NC\_028415 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Lepidium virginicum* | NC\_009273 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Lobularia maritima* | NC\_009274 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Nasturtium officinale* | NC\_009275 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Olimarabidopsis pumila* | NC\_009267 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Pachycladon cheesemanii* | NC\_021102 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Pachycladon enysii* | NC\_018565 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Raphanus sativus* | NC\_024469 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Brassicales | *Schrenkiella parvula* | NC\_028726 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Santalales | *Viscum minimum* | NC\_027829 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Caryophyllales | *Agrostemma githago* | NC\_023357 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Carnegiea gigantea* | NC\_027618 | 4 | 3 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Caryophyllales | *Colobanthus quitensis* | NC\_028080 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Fagopyrum esculentum* subsp*. ancestrale* | NC\_010776 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Fagopyrum tataricum* | NC\_027161 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Haloxylon ammodendron* | NC\_027668 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Haloxylon persicum* | NC\_027669 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Rheum palmatum* | NC\_027728 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Salicornia bigelovii* | NC\_027226 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Salicornia brachiata* | NC\_027224 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Salicornia europaea* | NC\_027225 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Silene chalcedonica* | NC\_023359 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Silene conica* | NC\_016729 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Silene conoidea* | NC\_023358 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Silene latifolia* | NC\_016730 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Silene noctiflora* | NC\_016728 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Silene paradoxa* | NC\_023360 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Silene vulgaris* | NC\_016727 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Caryophyllales | *Spinacia oleracea* | NC\_002202 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Actinidia chinensis* | NC\_026690 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Actinidia deliciosa* | NC\_026691 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Ardisia polysticta* | NC\_021121 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia crapnelliana* | NC\_024541 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia cuspidata* | NC\_022459 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia danzaiensis* | NC\_022460 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia grandibracteata* | NC\_024659 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia impressinervis* | NC\_022461 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia leptophylla* | NC\_024660 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia oleifera* | NC\_023084 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia petelotii* | NC\_024661 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia pitardii* | NC\_022462 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia pubicosta* | NC\_024662 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia reticulata* | NC\_024663 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia sinensis* | NC\_020019 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia taliensis* | NC\_022264 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Camellia yunnanensis* | NC\_022463 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Lysimachia coreana* | NC\_026197 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Primula poissonii* | NC\_024543 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Ericales | *Vaccinium macrocarpon* | NC\_019616 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 |
| Gentianales | *Asclepias nivea* | NC\_022431 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Asclepias syriaca* | NC\_022432 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Catharanthus roseus* | NC\_021423 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Coffea arabica* | NC\_008535 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Echites umbellatus* | NC\_025655 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Gentiana crassicaulis* | NC\_027442 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Gentiana straminea* | NC\_027441 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Gynochthodes nanlingensis* | NC\_028614 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Gynochthodes officinalis* | NC\_028009 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Nerium oleander* | NC\_025656 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Oncinotis tenuiloba* | NC\_025657 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Pentalinon luteum* | NC\_025658 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gentianales | *Rhazya stricta* | NC\_024292 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Atropa belladonna* | NC\_004561 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Capsicum annuum* | NC\_018552 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Capsicum frutescens* | NC\_028007 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Capsicum lycianthoides* | NC\_026551 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Cuscuta exaltata* | NC\_009963 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Solanales | *Cuscuta gronovii* | NC\_009765 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Solanales | *Cuscuta obtusiflora* | NC\_009949 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Solanales | *Cuscuta reflexa* | NC\_009766 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 |
| Solanales | *Datura stramonium* | NC\_018117 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Dunalia brachyacantha* | NC\_026906 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Dunalia obovata* | NC\_026563 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Dunalia solanacea* | NC\_027099 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Hyoscyamus niger* | NC\_024261 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Iochroma loxense* | NC\_026726 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Iochroma nitidum* | NC\_026567 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Iochroma stenanthum* | NC\_026574 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Iochroma tingoanum* | NC\_027177 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Ipomoea batatas* | NC\_026703 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Ipomoea purpurea* | NC\_009808 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Nicotiana sylvestris* | NC\_007500 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Nicotiana tabacum* | NC\_001879 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Nicotiana tomentosiformis* | NC\_007602 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Nicotiana undulata* | NC\_016068 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Physalis peruviana* | NC\_026570 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Saracha punctata* | NC\_026694 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum bulbocastanum* | NC\_007943 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum cheesmaniae* | NC\_026876 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Supplementary table S1. Continue

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Order | Species | Accession | *ndhA* | *ndhB* | *ndhC* | *ndhD* | *ndhE* | *ndhF* | *ndhG* | *ndhH* | *ndhI* | *ndhJ* | *ndhK* |
| Solanales | *Solanum chilense* | NC\_026877 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum commersonii* | NC\_028069 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum galapagense* | NC\_026878 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum habrochaites* | NC\_026879 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum lycopersicum* 1 | NC\_007898 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum lycopersicum* 2 | AC\_000188 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum neorickii* | NC\_026880 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum nigrum* | NC\_028070 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum peruvianum* | NC\_026881 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum pimpinellifolium* | NC\_026882 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Solanales | *Solanum tuberosum* | NC\_008096 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Ajuga reptans* | NC\_023102 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Andrographis paniculata* | NC\_022451 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Boea hygrometrica* | NC\_016468 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Boulardia latisquama* | NC\_025641 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Lamiales | *Cistanche deserticola* | NC\_021111 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 4 |
| Lamiales | *Cistanche phelypaea* | NC\_025642 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Lamiales | *Conopholis americana* | NC\_023131 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Lamiales | *Epifagus virginiana* | NC\_001568 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Lamiales | *Genlisea margaretae* | NC\_025652 | 4 | 2 | 4 | 4 | 3 | 4 | 4 | 4 | 2 | 4 | 4 |
| Lamiales | *Hesperelaea palmeri* | NC\_025787 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Jasminum nudiflorum* | NC\_008407 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Lathraea squamaria* | NC\_027838 | 2 | 2 | 1 | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| Lamiales | *Lindenbergia philippensis* | NC\_022859 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Olea europaea* | NC\_013707 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Olea europaea* subsp*. cuspidata* | NC\_015604 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Olea europaea* subsp*. europaea* | NC\_015401 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Olea europaea* subsp*. maroccana* | NC\_015623 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Olea woodiana* subsp*. woodiana* | NC\_015608 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Orobanche californica* | NC\_025651 | 4 | 1 | 4 | 4 | 2 | 4 | 3 | 4 | 4 | 2 | 3 |
| Lamiales | *Orobanche crenata* | NC\_024845 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Lamiales | *Orobanche gracilis* | NC\_023464 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Lamiales | *Orobanche purpurea* | NC\_023132 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Lamiales | *Orobanche ramosa* | NC\_023465 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Lamiales | *Pinguicula ehlersiae* | NC\_023463 | 3 | 1 | 4 | 3 | 2 | 4 | 2 | 2 | 2 | 2 | 3 |
| Lamiales | *Plantago maritima* | NC\_028519 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Plantago media* | NC\_028520 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Premna microphylla* | NC\_026291 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Rosmarinus officinalis* | NC\_027259 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Salvia miltiorrhiza* | NC\_020431 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Schwalbea americana* | NC\_023115 | 3 | 1 | 1 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 1 |
| Lamiales | *Scrophularia takesimensis* | NC\_026202 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Scutellaria baicalensis* | NC\_027262 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Scutellaria insignis* | NC\_028533 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Sesamum indicum* | NC\_016433 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Tanaecium tetragonolobum* | NC\_027955 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Tectona grandis* | NC\_020098 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Utricularia gibba* | NC\_021449 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Lamiales | *Utricularia macrorhiza* | NC\_025653 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Adenophora remotiflora* | NC\_026999 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Ageratina adenophora* | NC\_015621 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Artemisia frigida* | NC\_020607 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Artemisia montana* | NC\_025910 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Aster spathulifolius* | NC\_027434 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Brighamia insignis* | NC\_028633 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Campanula takesimana* | NC\_026203 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Centaurea diffusa* | NC\_024286 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Chrysanthemum indicum* | NC\_020320 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Chrysanthemum x morifolium* | NC\_020092 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Cynara baetica* | NC\_028005 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Cynara cornigera* | NC\_028006 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Cynara humilis* | NC\_027113 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Guizotia abyssinica* | NC\_010601 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Hanabusaya asiatica* | NC\_024732 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Helianthus annuus* | NC\_007977 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Helianthus decapetalus* | NC\_023110 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Helianthus divaricatus* | NC\_023109 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Helianthus giganteus* | NC\_023107 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Helianthus grosseserratus* | NC\_023108 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Helianthus hirsutus* | NC\_023111 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Helianthus maximiliani* | NC\_023114 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Helianthus strumosus* | NC\_023113 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Helianthus tuberosus* | NC\_023112 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Jacobaea vulgaris* | NC\_015543 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Lactuca sativa* | NC\_007578 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Leontopodium leiolepis* | NC\_027835 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Parthenium argentatum* | NC\_013553 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Praxelis clematidea* | NC\_023833 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Silybum marianum* | NC\_028027 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Asterales | *Trachelium caeruleum* | NC\_010442 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Anthriscus cerefolium* | NC\_015113 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Aralia undulata* | NC\_022810 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Brassaiopsis hainla* | NC\_022811 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Bupleurum falcatum* | NC\_027834 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Daucus carota* | NC\_008325 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Dendropanax dentiger* | NC\_026546 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Dendropanax morbifer* | NC\_027607 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Eleutherococcus senticosus* | NC\_016430 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Fatsia japonica* | NC\_027685 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Kalopanax septemlobus* | NC\_022814 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Metapanax delavayi* | NC\_022812 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Ostericum grosseserratum* | NC\_028618 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Panax ginseng* | NC\_006290 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Panax japonicus* | NC\_028703 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Panax notoginseng* | NC\_026447 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Panax quinquefolius* | NC\_027456 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Panax vietnamensis* | NC\_028704 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Pastinaca pimpinellifolia* | NC\_027450 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Schefflera delavayi* | NC\_022813 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Apiales | *Seseli montanum* | NC\_027451 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Dipsacales | *Lonicera japonica* | NC\_026839 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |