Appendix S1. Strain information for all sequences used in the phylogenetic analysis, including name, strain information, symbiotic associate (if known) and GenBank accession number.

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| --- | --- | --- | --- | --- |
| Algal species | Collection number (sequence contributor) | Fungal associates | *rbc*L | nuSSU |
| *Asterochloris erici* | IB 342 |  | AJ969631 | AB080310 |
| *A. magna* | IB 354, UTEX 902 |  | AJ969630 | Z21552 |
| *Botryococcus* sp. | Tow 9/21 |  | AY197640 | JN399235 |
| *Chloroidium angustoellipsoideum* | SAG 2115 |  | - | FM946019 |
| *C. ellipsoideum* | SAG 3.95 |  | - | FM946012 |
| *C. engadinense* | SAG 812-1 |  | - | FM946011 |
| *C. saccharophilum* | SAG 211-9a |  | - | FM946000 |
| *Chlorella vulgaris* | NIES 227 |  | AB260909 | AB488575 |
| *Coccomyxa chodatii* | UTEX 266 |  | FJ648512 | JF930328 |
| *Coccomyxa* sp. | *Brodo* 31515 (DUKE) | *Icmadophila ericetorum* | - | JN573865 |
| *C. glaronensis* | CCALA 306 |  | - | AM167525 |
| *C. pringsheimii* | SAG 69.80 |  | - | AY762603 |
| *C. dispar* | NIES2252 |  | - | AB488787, AB488788 |
| *C. dispar* | NIES2353 |  | - | AB488795, AB488794 |
| *C. peltigerae* | SAG 216-5 |  | JF502543 | - |
| *C. rayssiae* | UTEX 273 |  | FJ217384 | - |
| *Dictyochloropsis splendida* | UTEX LB 2599 | *Phlyctis argena* | EF113435 | - |
| *D. reticulata* | CCHU 5616 |  | KC333590 | Z47207 |
| *Dictyochloropsis* sp. | *Nelsen* 4179 (F) | *Lobaria pulmonaria* | JN573841 | - |
| *Chloroidium* sp. | W1196 (BM) | epiphyte on *Verrucaria praetermissa* | - | JN573885 |
| *Dictyochloropsis splendida* | CAUP H8601 |  | KC333607 | KC333457 |
| *Elliptochloris* sp. | *Amtoft* s. n. (DUKE) | *Stictis urceolata* | - | JN573866 |
| *E. bilobata var. corticola* | CAUP H7103 |  | - | EF688289 |
| *E. bilobata* | SAG 245.80 |  | - | AM422984 |
| *Elliptochloris* sp. | SAG 2117 |  | - | FJ217380 |
| *E. reniformis* | SAG 2200 |  | - | HQ317293 |
| *Myrmecia sp.* | SH2018 |  | JN573809 | JN573893 |
| *Nannochloris* sp. | CKM |  | AF446090 | AF446091 |
| *Picochlorum oculatum* | UTEX LB 1998 |  | EF113455 | AY422075 |
| *Prasiola calophylla* | GALW014331 |  | AY694194 | EF200521 |
| *P. fluviatilis* | s. n. (Sherwood *et al*. 2000) |  | AF189063 | AF189072 |
| *P. meridionalis* | s. n. (Sherwood *et al*. 2000) |  | AF189066 | AF189074 |
| *P. crispa* | SAG 43.96 |  | AM260441 | AJ416106 |
| *Prasiococcus calcarius* | Prca1 |  | EF203011 | EF200527 |
| *Prasiolopsis ramosa* | SAG 26.83 |  | EF203015 | AY762600 |
| *Pseudococcomyxa simplex* | CAUP 103 |  | - | HE586505 |
| *P. simplex* | SAG216-9a |  | - | FN298926 |
| *P. simplex* | UTEX 274 |  | - | FJ648514 |
| *Rosenvingiella constricta* | GALW015433 |  | EF203019 | EF200529 |
| *R. polyrhiza* | GALW010139 |  | AY694206 | EF200515 |
| *R. radicans* | GALW015236 |  | AY694204 | EF200516 |
| *Stichococcus bacillaris* | K4 4 |  | - | AB055866 |
| *Diplosphaera* sp. | CG378 (MARSSJ) | *Staurothele areolata* | JN573822 | JN573897 |
| *Stichococcus chlorelloides* | CNP2VF11b (Lewis & Lewis 2005) |  | - | AY271675 |
| *Diplosphaera* sp. | W1112 (BM) | *Staurothele areolata* | - | JN573888 |
| *Watanabea reniformis* | SAG 211-9b |  | - | X73991 |