Table S1. *Voucher data of sequences acquired from GenBank.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Taxon** | **ID** | **Collection country; reference** | **ITS**  | **RPB2** | **mrSSU** |
| ***Dendriscostica*** Moncada & Lücking |
| *D. nylanderiana* | Takahashi 2472 (HIRO) | China: Yunnan; unpublished | AB245119 | — | — |
|  | Takahashi 2975 (HIRO) | Japan: Hokkaido, Kamikawa-gun, Shimokawa-cho; unpublished | AB245120 | — | — |
|  | Harada 21782 (CBM-FL) | Taiwan; unpublished | AB245121 | — | — |
| *D. oroborealis* | Tønsberg 20664 | Canada: British Columbia; Tønsberg & Goward 2001 | AF208015 | — | — |
| *D. praetextata*  | Takahashi 2493 (HIRO) | China: Yunnan; unpublished | AB245122 | — | — |
| *D. wrightii*  | Takahashi 2349 (HIRO) (cyanomorph) | China: Yunnan; Takahashi *et al.* (2006) | AB239339 | — | — |
|  | Takahashi 1815 (HIRO) | Japan: Shizuoka, Mt. Fuji; Takahashi *et al.* (2006) | AB239341 | — | — |
|  | Takahashi 2016 (HIRO) | Japan: Nara, Yoshino-gun, Tenkawa-mura, Mt. Inamuragatake; Takahashi *et al.* (2006) | AB239342 | — | — |
|  | Takahashi 2436 (HIRO) | China: Yunnan; Takahashi *et al.* (2006) | AB239344 | — | — |
| ***Lobariella*** Moncada & Lücking |
| *L. angustata* | DNA6193Vargas & Herrera 310a | Colombia; Moncada *et al.* (2013) | KC011030 | — | — |
| *L. auriculata* | DNA5517Moncada 3075 | Colombia; Moncada *et al.* (2013) | KC011032 | — | — |
| *L. botryoides* | DNA5380Moncada s.n. | Colombia; Moncada *et al.* (2013) | KC011033 | — | — |
| *L. crenulata* | DNA6203Diaz & Soto L9 | Colombia; Moncada *et al.* (2013) | KC011034 | — | — |
| *L. ecorticata* | DNA5516Moncada 3156 | Colombia; Moncada *et al.* (2013) | KC011035 | — | — |
| *L. flavomedullosa* | DNA5395Moncada s.n. | Colombia; Moncada *et al.* (2013) | KC011036 | — | — |
|  | DNA5419Rodriguez & Zarate 37 | Colombia; Moncada *et al.* (2013) | — | — | KC011074 |
| *L. isidiata* | DNA6204Diaz & Soto L12 | Colombia; Moncada *et al.* (2013) | KC011038 | — | — |
| *L. pallida* | DNA5584Luecking 33379 | Colombia; Moncada *et al.* (2013) | KC011039 | — | — |
|  | AFTOL-ID 310 | Costa Rica–Cartago; Miadlikowska *et al.* 2006; Schmull *et al.* 2011 | HQ650695 | DQ883752 | DQ912296 |
|  | AFTOL-ID 314 | Costa Rica–Cartago; Miadlikowska *et al.* 2006; Schmull *et al.* 2011 | HQ650696 | DQ883753 | DQ912297 |
| *L. pallidocrenulata* | DNA5582aLuecking 33371a | Colombia; Moncada *et al.* (2013) | KC011051 | — | KC011075 |
|  | DNA5417Luecking 33371c | Colombia; Moncada *et al.* (2013) | KC011047 | – | – |
|  | DNA6205 Diaz & Soto L10 | Colombia; Moncada *et al.* (2013) | KC011055 | – | – |
| *L. parmelioides* | DNA6216Moncada 5351 | Colombia; Moncada *et al.* (2013) | KC011056 | — | — |
| *L. pseudocrenulata* | DNA6176Vargas & Herrera 309b | Colombia; Moncada *et al.* (2013) | KC011061 | — | — |
| *L. reticulata* | DNA6304Moncada 4982 | Colombia; Moncada *et al.* (2013) | KC011063 | — | KC011076 |
| *L. sipmanii* | DNA5387Moncada s.n. | Colombia; Moncada *et al.* (2013) | KC011064 | — | — |
| *L. soredians* | DNA5381Moncada s.n. | Colombia; Moncada *et al.* (2013) | KC011067 | — | — |
| *L. subexornata* | Nash III 42486 (H) | Mexico: Hidalgo; Högnabba *et al.* (2009) | — | — | EU558804 |
| ***Ricasolia*** |
| *R. amplissima* | 1996 Stöcker-Wörgotter 1717 (TUR) (chloromorph) | Norway–Hordaland; Stenroos *et al.* 2003; Högnabba *et al.* 2009 | AF524923 | — | EU558807 |
|  | 1996 Stöcker-Wörgotter 1717 (TUR)(cyanomorph) | Norway–Hordaland; Stenroos *et al.* 2003; Högnabba *et al.* 2009 | AF524924 | — | EU558805 |
|  | 1999 Holien s.n. (TUR) (chloromorph) | Norway; Stenroos *et al.* 2003 | AF524925 | — | — |
|  | 1999 Holien s.n. (TUR) (cyanomorph) | Norway; Stenroos *et al.* 2003 | AF524926 | — | — |
|  | 1996 Stöcker-Wörgotter 1719 (TUR)(cyanomorph) | Norway–Hordaland; Stenroos *et al.* 2003; Högnabba *et al.* 2009 | AF524927 | — | EU558806 |
|  | 1998 Kondratyuk 98112-3A (TUR) | Ukraine; Stenroos *et al.* 2003 | AF524928 | — | — |
|  | 1998 Kondratyuk 98112-3a (TUR) | Ukraine; Stenroos *et al.* 2003 | AF524929 | — | — |
|  | Wedin 6172 (BM) | UK; Wiklund & Wedin 2003 | — | — | AY340500 |
|  | Wedin 6173 (BM) | UK; Wiklund & Wedin 2003 | — | — | AY340501 |
| *R. quercizans* | 1999 Ahti 57089 (H) | Canada–Nova Scotia; Stenroos *et al.* 2003; Högnabba *et al.* 2009 | AF524921 | — | EU558814 |
|  | AFTOL-ID 369 | Lutzoni *et al.* 2004; Schmull *et al.* 2011 | HQ650694 | AY641052 | AY584710 |
| *R. virens* | Wedin 6192 (BM) | Norway; Wiklund & Wedin 2003 | — | — | AY340508 |
|  | Wedin 6192 (BM) | Norway; Tønsberg *et al.* 2016 | KJ577709 | — | — |
|  | Blom V1 (BG) | Norway; Tønsberg *et al.* 2016 | KJ577710 | — | — |
|  | Blom A13 (BG) | Norway; Tønsberg *et al.* 2016 | KJ577711 | — | — |
| ***Yoshimuriella*** Moncada & Lücking |
| *Y. fendleri* | 1997 Ribeiro s.n. (TUR) | Brazil: Minas Gerais; Stenroos *et al.* 2003 | AF524915 | — | — |
| *Y. dissecta* | 1997 Stenroos 4786b (TUR) | Guyana; Stenroos *et al.* 2003; Högnabba *et al.* 2009 | AF524920 | — | EU558808 |
| *Y. subdissecta* | Moncada 3152 | Colombia; Moncada *et al.* 2013 | KC011029 | — | KC011073 |

References

Högnabba, F., Stenroos, S. and Thell, A. (2009) Phylogenetic relationships and evolution of photobiont associations in the Lobariaceae (Peltigerales, Lecanoromycetes, Ascomycota). In *Diversity of Lichenology - Anniversary Volume* (A. Thell, M. R. D. Seaward and T. Feuerer, eds): 157–187.

Lutzoni, F., Kauff, F., Cox, C. J., Mclaughlin, D., Celio, G., Dentinger, B., Padamsee, M., Hibbett, D., James, T. Y., Baloch, E., Grube, M., Reeb, V., Hofstetter, V., Schoch, C., Arnold, A. E., Miadlikowska, J., Spatafora, J., Johnson, D., Hambleton, S., Crockett, M., Shoemaker, R., Hambleton, S., Crockett, M., Shoemaker, R., Sung, G. H., Lucking, R., Lumbsch, T., O'donnell, K., Binder, M., Diederich, P., Ertz, D., Gueidan, C., Hansen, K., Harris, R. C., Hosaka, K., Lim, Y. W., Matheny, B., Nishida, H., Pfister, D., Rogers, J., Rossman, A., Schmitt, I., Sipman, H., Stone, J., Sugiyama, J., Yahr, R. and Vilgalys, R. (2004) Assembling the fungal tree of life: Progress, classification and evolution of subcellular traits. *American Journal of Botany* **91:** 1446–1480.

Miadlikowska, J., Kauff, F., Hofstetter, V., Fraker, E., Grube, M., Hafellner, J., Reeb, V., Hodkinson, B. P., Kukwa, M., Lucking, R., Hestmark, G., Otalora, M. G., Rauhut, A., Budel, B., Scheidegger, C., Timdal, E., Stenroos, S., Brodo, I., Perlmutter, G. B., Ertz, D., Diederich, P., Lendemer, J. C., May, P., Schoch, C. L., Arnold, A. E., Gueidan, C., Tripp, E., Yahr, R., Robertson, C. and Lutzoni, F. (2006) New insights into classification and evolution of the Lecanoromycetes (Pezizomycotina, Ascomycota) from phylogenetic analyses of three ribosomal RNA- and two protein-coding genes. *Mycologia* **98:** 1088–1103.

Moncada, B., Lücking, R. and Betancourt-Macuase, L. (2013) Phylogeny of the Lobariaceae (lichenized Ascomycota: Peltigerales), with a reappraisal of the genus *Lobariella*. *Lichenologist* **45:** 203–263.

Schmull, M., Miadlikowska, J., Pelzer, M., Stocker-Wörgötter, E., Hofstetter, V., Fraker, E., Hodkinson, B. P., Reeb, V., Kukwa, M. and Lumbsch, H. T. (2011) Phylogenetic affiliations of members of the heterogeneous lichen-forming fungi of the genus *Lecidea* sensu Zahlbruckner (Lecanoromycetes, Ascomycota). *Mycologia* **103:** 983–1003.

Stenroos, S., Stocker-Wörgötter, E., Yoshimura, I., Myllys, L., Thell, A. and Hyvonen, J. (2003) Culture experiments and DNA sequence data confirm the identity of *Lobaria* photomorphs. *Canadian Journal of Botany* **81:** 232–247.

Takahashi, K., Wang, L. S., Tsubota, H. and Deguchi, H. (2006) Photosymbiodemes *Sticta wrightii* and *Dendriscocaulon* sp. (lichenized Ascomycota) from Yunnan, China. *Journal of the Hattori Botanical Laboratory* **100:** 783–796.

Tønsberg, T. and Goward, T. (2001) *Sticta oroborealis sp nov.*, and other Pacific North American lichens forming dendriscocauloid cyanotypes. *Bryologist* **104:** 12–23.

Tønsberg, T., Blom, H. H., Goffinet, B., Holtan-Hartwig, J. and Lindblom, L. (2016) The cyanomorph of *Ricasolia virens* comb. nov. (Lobariaceae, lichenized Ascomycetes). *Opuscula Philolichenum* **15:** 12–21.

Wiklund, E. and Wedin, M. (2003) The phylogenetic relationships of the cyanobacterial lichens in the Lecanorales suborder Peltigerineae. *Cladistics* **19:** 419–431.