

Suppl Data Table S1. Specimens sampled, their taxonomic name, the family in which the genera were placed by Baral (2016) unless otherwise indicated, the family accepted based on the analyses in this paper, and the sequences available for those specimens, either as Sanger sequences (with Genbank accession number, otherwise available from alignments in <https://doi.org/10.7931/75YV-BE95>) or as extracts from genomes deposited in JGI and NCBI (extracts available from alignments in <https://doi.org/10.7931/75YV-BE95>). Newly generated sequences and genomes are in bold.

| Code | species | current higher taxon [1] | Accepted higher taxon | type status [2] | Voucher or strain | NCBI genome biosample | JGI genome | notes | SSU | ITS | LSU | RPB1 | RPB2 | RPA1 | mTSU | TEF1 | Btub | MCM7 | RPC2 | TFB4 | RP42 | a-tub | SFB1 | | | | | | |
|------------------------|--------------------------------|-----------------------------|-----------------------------|-----------------|-----------------------------|-----------------------|---------------------|---|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--|--|--|--|
| ACM109321 | Acephala macrantha | Mollisiaceae | Mollisiaceae | exType specimen | CBS 109321 | | | | NR_119482 | KF951051 | KT225541 | | | | | | | | | | | | | | | | | | |
| Acema1 | Acephala macrolerotorum | Mollisiaceae | Mollisiaceae | Type species | TU 123555 | | Acema1 (12) | = CCM-F12186 | NR_112349 | KF951051 | KT225541 | | | | | | | | | | | | | | | | | | |
| DSM104360 | Alticopora acuminata | Leotaceae (S) | Leotiales incertae sedis | Type species | DSM 104360 (6) | | | ITS of specimen ex Japan a little different to KT005452 (ex Sweden - type locality) | MK226454 | AY204588 | MK226457 | MK21480 | MK21444 | | | | | | | | | | | | | | | | |
| A_acu_Hosoya | Albotrichia acutipila | Lachnaceae | Lachnaceae | Type species | FC-2262, TNS-F-16740 (7) | | | | LC434582 | AB481234 | LC431679 | AB481317 | | | | | | | | | | | | | | | | | |
| A_ab Hosoya | Albotrichia albotestacea | Lachnaceae | Lachnaceae | Type species | FC-2094, TNS-F-16497 (7) | | | | AB481233 | AB481233 | AB481303 | | | | | | | | | | | | | | | | | | |
| KL391 | Ameghinella australis | Cordieritaceae | Cordieritaceae | Type species | FH 01146515 | | | | KX090893 | MH752070 | KM20841 | KX090787 | | | | | | | | | | | | | | | | | |
| FK51377 | Amorphothecium castaneum | | Heterobasidion (Clade 7) | | KO831237 | | | | NR_109582 | JN086583 | JN086584 | JN086766 | | | | | | | | | | | | | | | | | |
| Amphorophores restiae | Amorphophores restiae | Amorphophorellaceae | Amorphophorellaceae | Type species | ATCC-22711 | | Amore1 (4, 13) | | EU033278 | EU032050 | EU032050 | JN086583 | | | | | | | | | | | | | | | | | |
| D68 | Anteromycetes nothofagi | Tympanidaceae | Leotiales incertae sedis | Type species | ICMP-21969 (8) | | SAMNO990775 (3, 4) | | MGW07391 | KM672201 | MG07387 | | | | | | | | | | | | | | | | | | |
| D781 | Archaeopeiza aranea | Archaeopeizaceae | Archaeopeizaceae | Type species | ICMP-21731 (9) | | | | MH678553 | MH682248 | MH682248 | | | | | | | | | | | | | | | | | | |
| TNS_F11212 | Archaeopeiza aurata | Archaeopeizaceae | Archaeopeizaceae | Type species | TNS-F-11213 (7) | | | | JN068636 | JN068636 | JN068636 | JN068636 | | | | | | | | | | | | | | | | | |
| A aurel Hosoya | Archaeopeiza aurelia | Archaeopeizaceae | Archaeopeizaceae | Type species | TNS-F-40009 (7) | | | | LC434570 | JN032436 | LC425036 | LC431691 | JN068680 | JN068680 | JN068680 | JN068680 | JN068681 | | | | | |
| TNS_F12768 | Archaeopeiza obtusula | Archaeopeizaceae | Archaeopeizaceae | Type species | TNS-F-22768 (7) | | | | LC434571 | JN033445 | JN068674 | LC431670 | JN068680 | JN068680 | JN068680 | JN068680 | JN068681 | | | | | |
| DSM104345 | Articulospora tetralacria | Discinella-Pezoloma lineage | Discinella-Pezoloma lineage | Type species | DSM 104345 (6) | | | | MK226453 | MK226461 | MK226466 | MK21471 | MK214436 | | | | | | | | | | | | | | | | |
| KUS_F52551 | Ascocoryne cylindrum | Galatinodiscaceae | Galatinodiscaceae | Type species | TNS-F-15227 (7) | | | | LC434577 | JN033406 | JN086709 | LC431673 | JN086782 | | | | |
| Ascs1 | Ascocoryne sarcoides | Galatinodiscaceae | Galatinodiscaceae | Type species | NRRL 50072 | | Ascs1 (4, 28) | | MH682237 | MH682251 | MH682251 | | | | | | | | | | | | | | | | | | |
| D369 | Ascocoryne sp. | Galatinodiscaceae | Galatinodiscaceae | Type species | ICMP 22539 (8) | | | | | | | | | | | | | | | | | | | | | | | | |
| Blur1 | Blumeria graminis f.sp. hordei | Erysiphaceae | Erysiphaceae | Type species | DH14 | | Blur1 (4, 14) | | | | | | | | | | | | | | | | | | | | | | |
| Bot1 | Botryotis cinerea | Sclerotiniaceae | Sclerotiniaceae | Type species | B05.10 | | Botci1 (4, 15) | | | | | | | | | | | | | | | | | | | | | | |
| KUS_P52031 | Brunniphila fuscescens | Lachnaceae | Lachnaceae | Type species | KUS-F52031; TNS-F-16635 (7) | | | | LC434580 | JN033392 | LC424945 | LC431677 | JN068645 | | | | |
| M141 | Bryoscypha dicrani | Helotiaceae | Helotiaceae | Type species | TUR 185318 | | | | EU940183 | EU940183 | EU940187 | EU940203 | | | | | | | | | | | | | | | | | |
| AFTOL_ID_916 | Bulgaria inquinans | Phacidellaceae | Phacidellaceae | Type species | CBP 118 31 | | | | LC434581 | JN033406 | JN086709 | LC431673 | JN23854 | | | | |
| TL2011 | Bulgariella pulia | Phacidellaceae | Phacidellaceae | Type species | CBS 118 31 | | Bulin1 (4, 25) | | | | | | | | | | | | | | | | | | | | | | |
| Mo12 | Cadophora malorum | Ploettnerulaceae | Ploettnerulaceae | Type species | TL2011 | | | | KU845534 | KU845537 | KU845535 | | | | | | | | | | | | | | | | | | |
| Cad19 | Cadophora sp S511049 | Ploettnerulaceae | Ploettnerulaceae | Type species | SE10409 | | Cadsp1 (4, 16) | | | | | | | | | | | | | | | | | | | | | | |
| VPR42388 | Calymella variabilis | Helotiaceae | Helotiaceae | exType specimen | CSIRO, FRR 6070 | | SAMNO4263868 (4) | | | | | | | | | | | | | | | | | | | | | | |
| HMAS187063 | Calymellopsis vischianbanna | Dermateaceae (S) | Dermateaceae | Type species | HMAS 187063 (9) | | | | GU936124 | KR094163 | MH729338 | JN923945 | | | | | | | | | | | | | | | | | |
| AFTOL_ID_1301 | Calycina citrina | Pezizellaceae | Pezizellaceae | Type species | TNS-F-37025 (7) | | | | LC434582 | JN033406 | LC169492 | LC431690 | JN086782 | | | | |
| B_dsc_Hosoya | Calycina discedens | Pezizellaceae | Pezizellaceae | Type species | CBS 466.73 | | SAMNO4158973 | | | | | | | | | | | | | | | | | | | | | | |
| CBS_66_73 | 'Calycina herbarum' | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bisps1 | Calycina sp. | Pezizellaceae | Pezizellaceae | Type species | PMI 857 | | Bisp1 (4, 12) | | | | | | | | | | | | | | | | | | | | | | |
| KL174 | Cananephopsis quericola | Cenanglaceae | Cenanglaceae | Type species | TAAm 178677 | | | | | | | | | | | | | | | | | | | | | | | | |
| KL243 | 'Cananephopsis' acuminatum | Rustrotromiaceae | Rustrotromiaceae | Type species | TAAM 198515 | | | | | | | | | | | | | | | | | | | | | | | | |
| KL390 | Canenephopsis mucronosus | Cenanglaceae | Cenanglaceae | Type species | TAAM 198451 | | | | | | | | | | | | | | | | | | | | | | | | |
| BPB43553 | Chaetomella oblonga | Chaetomellaceae | Chaetomellaceae | Type species | CBS 110.76 | | | | | | | | | | | | | | | | | | | | | | | | |
| Chal1 | Chalara longipes | Pezizellaceae | Pezizellaceae | Type species | BDJ | | Chalo1 (4, 12) | | | | | | | | | | | | | | | | | | | | | | |
| D1686 | Chlorocoelia torta | Cenanglaceae | Cenanglaceae | Type species | ICMP 21732 (8) | | SAMNO9907751 (3, 4) | | | | | | | | | | | | | | | | | | | | | | |
| KP506 | Chlorocoelia versiformis | Cenanglaceae | Cenanglaceae | Type species | TU 107606 | | | | | | | | | | | | | | | | | | | | | | | | |
| IHA193 | Chlorocoelia aeruginascens | Chlorociboriaceae | Chlorociboriaceae | Type species | IHA193 | | SAMNO670663 (4) | | | | | | | | | | | | | | | | | | | | | | |
| C_aeruginascens Hosoya | Chlorocoelia aeruginascens | Chlorociboriaceae | Chlorociboriaceae | Type species | TNS-F-36241 (7) | | | | | | | | | | | | | | | | | | | | | | | | |
| KL247 | Chlorocoelia aeruginella | Chlorociboriaceae | Chlorociboriaceae | Type species | TAAM 198514 (10) | | | | | | | | | | | | | | | | | | | | | | | | |

