**SUPPLEMENTARY MATERIAL**

**High-throughput sequencing of fungal communities across the perennial ice block of Scărișoara Ice Cave**

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**Table S4.** Most abundant fungal OTUs of Scarisoara ice block

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| --- | --- | --- | --- | --- | --- |
| **Ice Age  (Years)** | **OTUs** | **Taxonomic rank** | **Closest match  (accession number)** | **Identity  (%)** | **Origin** |
|  | OTU 20 | Ascomycota, Taphrinomycetes, Taphrinales, Taphrinaceae,  unclassified, unclassified | *Taphrina* sp. (JF495183) | 95% | Beech litter, Austria |
|  | OTU 21 | Ascomycota, Lecanoromycetes, Lecanoromycetes order Incertae sedis, Coniocybaceae, Chaenotheca,  Chaenotheca xyloxena | *Chaenotheca xyloxena* (AF421210) | 100% | Dead wood, Sweden, Slovenia |
| 1 | OTU 36 | Ascomycota, unclassified, unclassified, unclassified ,  unclassified, unclassified | *Pezizomycotina* (JF495199) | 95% | Beech litter, Austria |
|  | OTU 28 | Ascomycota, Lecanoromycetes, Lecanorales,  Parmeliaceae, Hypogymnia, Hypogymnia sp. | *Hypogymnia sp.* (AM901734) | 100% | House dust, Finland |
|  | OTU 31 | Chytridiomycota, unclassified, unclassified,  unclassified, unclassified, unclassified | Uncultured fungus soil (MF569902) | 92% | Soil, Unspecified area |
|  | OTU 11 | Ascomycota, Dothideomycetes, Capnodiales, Mycosphaerellaceae, unclassified, unclassified | Uncultured *Mycosphaerella* (JF449741) | 96% | Beech litter, Austria |
| 400 | OTU 22 | Ascomycota, Dothideomycetes, unclassified,  unclassified, unclassified, unclassified | Uncultured fungus (KP897304) | 97% | Picea abies (tree) needles, Lithuania |
|  | OTU 27 | Basidiomycota, Agaricomycetes, Agaricales, Lyophyllaceae,  Lyophyllum, Lyophyllum connatum | *Lyophyllum connatum* (KM406963) | 100% | Soil, North Vancouver |
|  | OTU 56 | Ascomycota, Dothideomycetes, unclassified,  unclassified, unclassified, unclassified | Uncultured fungus (KX193254) | 98% | Soil, USA |
|  | OTU 2 | Basidiomycota, Microbotryomycetes, Leucosporidiales, Leucosporidiaceae, Leucosporidiella,  Leucosporidiella yakutica | *Leucosporidiella yakutica* (KC884328) | 100% | Permafrost, China |
|  | OTU 6 | Basidiomycota, unclassified, unclassified,  unclassified, unclassified, unclassified | *Cystobasidium pinicola* (KY103147) | 92% | Tree, China |
| 900 | OTU 25 | Basidiomycota, Microbotryomycetes,  Sporidiobolales, unclassified Sporidiobolales,  unclassified Sporidiobolales, Sporidiobolales sp. | *Sporidiobolales sp.* (KY104694) | 100% | Plant, Germany |
|  | OTU 26 | Ascomycota, Sordariomycetes, Hypocreales,  Hypocreales family Incertae sedis,  Myrothecium, unclassified | *Myrothecium* (KY552261) | 100% | Field soil, USA |
|  | OTU 46 | Ascomycota, Dothideomycetes, Pleosporales,  unclassified, unclassified, unclassified | Uncultured fungus (MF976790) | 97% | Nothofagus (tree), New Zealand |
|  | OTU 5 | Ascomycota, Eurotiomycetes o Chaetothyriales, unclassified Chaetothyriales,  unclassified Chaetothyriales, Chaetothyriales sp. | *Chaetothyriales sp.* (LC018822) | 100% | Human , Japan |
|  | OTU 8 | Ascomycota, Dothideomycetes, Dothideales, Dothioraceae,  Aureobasidium, Aureobasidium sp. | *Aureobasidium sp.* (MF687197) | 100% | Prunus persica leaf (tree), New zealand |
| 1200 | OTU 10 | Ascomycota, Dothideomycetes, Capnodiales, Davidiellaceae,  Cladosporium, unclassified | *Cladosporium* (MF683462) | 100% | Sooty mould on Kunzea ericoides (tree) New Zealand |
|  | OTU 24 | Basidiomycota, Agaricomycetes, unclassified Agaricomycetes, unclassified Agaricomycetes, unclassified Agaricomycetes, Agaricomycetes sp. | *Agaricomycetes sp.* (MF687187) | 100% | Rotten wood, New Zealand |
|  | OTU 227 | Ascomycota, Leotiomycetes, unclassified, unclassified,  unclassified, unclassified | *Heterosphaeria patella* (MF196187) | 96% | Heracleum sphondylium (plant), Luxembourg |
|  | OTU 1 | Ascomycota, Dothideomycetes, Pleosporales, Pleosporaceae,  Alternaria, Alternaria sp. | *Alternaria sp.*  (MF972504) | 100% | Archaeological marble, Italy |
|  | OTU 10 | Ascomycota, Dothideomycetes, Capnodiales,  Davidiellaceae, Cladosporium, unclassified | *Cladosporium* (MF683462) | 100% | Sooty mould on Kunzea ericoides (tree) New Zealand |
| 1500 | OTU 16 | Ascomycota, unclassified Ascomycota, unclassified Ascomycota, unclassified Ascomycota, unclassified Ascomycota, ascomycete sp. | *Helicodendron triglitziense* (EF029239) | 96% | Unspecified |
|  | OTU 29 | Ascomycota, Dothideomycetes, Pleosporales, Phaeosphaeriaceae, Phaeosphaeria, Phaeosphaeria sp. | *Phaeosphaeria sp.* (MF120205) | 100% | Soil, Antarctica |
|  | OTU 32 | Ascomycota, Eurotiomycetes, Eurotiales, Trichocomaceae,  Eurotium, Eurotium sp. | *Eurotium sp.* (MF319916) | 100% | River water, India |