**Suppl. Data Table 5**. Frequency of 454 detection from both forward and reverse reads for those species detected in culture. Taxon names from Joshee et al. (2009) and Johnston et al. (2012).

| **Name** | **Culture**  **(n = 1356)** | **454 reverse reads**  **(n = 87177)** | **454 forward reads (n = 39564)** |
| --- | --- | --- | --- |
| **Agaricales** |  |  |  |
| Corticiaceae sp. 3 | 6 | 0 | 0 |
| Corticiaceae sp. 5 | 1 | 0 | 0 |
| Corticiaceae sp. 6 | 1 | 0 | 0 |
| **Botryosphaeriales** |  |  |  |
| *Phyllosticta* sp. 1 | 15 | 0 | 0 |
| **Capnodiales** |  |  |  |
| *Mycosphaerella* sp. 1 | 312 | 5712 | 28393 |
| *Mycosphaerella* sp. 2 | 31 | 18650 | 14290 |
| *Mycosphaerella* sp. 4 | 2 | 57 | 2 |
| *Mycosphaerella* sp. 7 | 1 | 10966 | 6106 |
| *Mycosphaerella* sp. 6 | 2 | 27 | 0 |
| **Chaetothyriales** |  |  |  |
| *Phaeomoniella* sp. 3 | 02 | 472 | 48 |
| *Phaeomoniella* sp. 2 | 02 | 19 | 6 |
| *Phaeomoniella* sp. 1 | 4 | 10 | 0 |
| **Coniochaetales** |  |  |  |
| Coniochaeta sp. 1 | 2 | 0 | 0 |
| **Diaporthales** |  |  |  |
| Diaporthales sp. 1 | 2 | 0 | 0 |
| Diaporthales sp. 2 | 53 | 0 | 0 |
| *Diaporthe* sp. 1 | 86 | 47 | 0 |
| Gnomoniaceae sp. 1 | 63 | 03 | 1 |
| Gnomoniaceae sp. 2 | 7 | 78 | 48 |
| **Eurotiales** |  |  |  |
| Eurotiomycetidae sp. 1 | 02 | 77 | 109 |
| **Helotiales** |  |  |  |
| Helotiales sp. 1 | 12 | 224 | 162 |
| Helotiales sp. 2 | 1 | 0 | 0 |
| Helotiales sp. 4 | 02 | 4 | 0 |
| Helotiales sp. 5 | 1 | 3 | 0 |
| Helotiales sp. 6 | 1 | 6 | 13 |
| Helotiales sp. 7 | 1 | 40 | 29 |
| Hyaloscyphaceae sp. 2 | 1 | 287 | 179 |
| *Hymenoscyphus* sp. 11 | 17 | 04 | 04 |
| *Hymenoscyphus* sp. 21 | 2 | 73 | 27 |
| *Hymenoscyphus* sp. 31 | 1 | 4 | 0 |
| *Hymenoscyphus* sp. 41 | 18 | 1 | 0 |
| *Mollisia* sp. 1 | 1 | 14 | 26 |
| *Mollisia* sp. 3 | 02 | 6 | 4 |
| *Pezicula* sp. 1 | 7 | 0 | 0 |
| *Pezicula* sp. 2 | 02 | 1 | 0 |
| *Pezicula* sp. 3 | 1 | 0 | 0 |
| *Pezicula* sp. 4 | 1 | 0 | 0 |
| *Torrendiella brevisetosa* | 8 | 9 | 0 |
| *Torrendiella cannibalensis* | 171 | 199 | 96 |
| *Torrendiella dingleyae* | 6 | 0 | 0 |
| *Torrendiella* sp. 1 | 02 | 35 | 30 |
| *Torrendiella* sp. 2 | 1 | 0 | 0 |
| Pezizales sp. 1 | 02 | 7 | 4 |
| Pezizales sp. 2 | 02 | 0 | 4 |
| **Pleosporales** |  |  |  |
| Pleosporaceae sp. 1 | 02 | 13 | 9 |
| Pleosporales sp. 1 | 02 | 127 | 47 |
| *Preussia* sp. 1 | 02 | 433 | 527 |
| *Preussia* sp. 2 | 02 | 79 | 13 |
| **Xylariales, Xylariaceae** |  |  |  |
| *Annulohypoxylon bovei* | 2 | 1 | 0 |
| *Anthostomella* sp. 1 | 02 | 2 | 0 |
| *Biscogniauxia* sp. 1 | 269 | 0 | 3 |
| *Biscogniauxia* sp. 2 | 107 | 5 | 3 |
| *Biscogniauxia* 4.3.2.m.10 | 3 | 0 | 0 |
| *Xylaria castorea* | 40 | 22 | 13 |
| *Xylaria* sp. 1 | 4 | 5 | 1 |
| Xylariaceae sp. 1 | 6 | 0 | 0 |
| Xylariaceae sp. 2 | 3 | 0 | 0 |
| Xylariaceae sp. 3 | 1 | 0 | 0 |
| Xylariaceae sp. 5 | 1 | 0 | 0 |
| Xylariaceae sp. 6 | 1 | 0 | 0 |
| Xylariaceae sp. 7 | 1 | 0 | 0 |
| **Xylariales, other families** |  |  |  |
| *Cylindrium* sp. 2 | 1 | 11 | 6 |
| *Cylindrium* sp. 3 | 1 | 619 | 443 |
| *Pestalotiopsis* sp. 1 | 3 | 6 | 0 |
| *Phlogicylindrium* sp. 1 | 95 | 130 | 42 |
| *Phlogicylindrium* sp. 2 | 2 | 05 | 05 |
| *Phlogicylindrium* sp. 3 | 2 | 26 | 18 |
| Xylariales sp. 1 | 02 | 289 | 5 |
| **incertae sedis** |  |  |  |
| Pezizomycotina sp 2 | 02 | 13 | 19 |

1 *Hymenoscyphus* sp. 1 = *H. haasticus*; *Hymenoscyphus* sp. 2 = *H. ohakune*; *Hymenoscyphus* sp. 3 = *H. kiko*; *Hymenoscyphus* sp. 4 = *H. waikaia*.

2 detected in culture from other *Nothofagaceae* sites

3 Three reverse reads, not distinguished from *Gnomoniaceae* sp. 2 in Uparse pipeline.

4 Not distinguished from *Hymenoscyphus* sp. 2 in Uparse pipeline.

5 Detected in the QIIME analysis using a truncqual score of <10, but filtered during the analysis using a truncqual score of <15.