

Supplementary Materials:

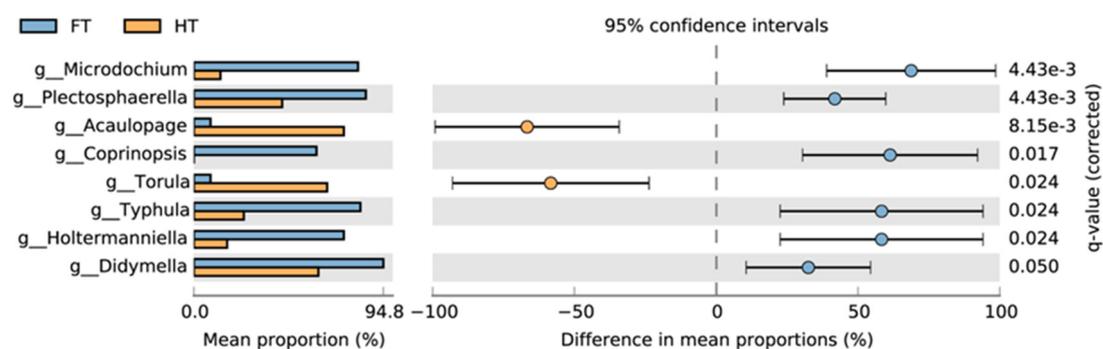


Figure S1. Welch' s t-test and Storey' s FDR were used to evaluate biological importance ($p < 0.05$) and differences between FT and RT treatment on genus level.

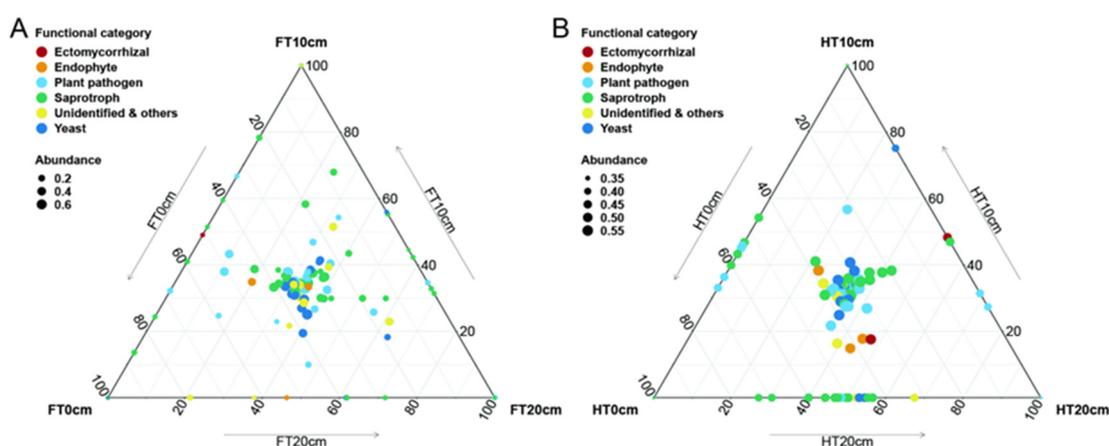


Figure S2. Potential function succession of soil fungal communities in (A) freeze-thaw treatment and (B) homiothermal treatment.

Table S1. Network parameters without potential keystone.

| Treatment | Water coverage | Nodes/Edge | Average Degree | Average Weighted Degree | Modularity |
|-----------|----------------|------------|----------------|-------------------------|------------|
| FT | 0cm | 68/146 | 3.066 | 2.892 | 1.03 |
| | 10cm | 62/154 | 3.317 | 2.237 | 1.02 |
| | 20cm | 61/132 | 3.054 | 1.514 | 1.131 |
| HT | 0cm | 73/165 | 3.623 | 2.529 | 0.987 |
| | 10cm | 59/140 | 3.91 | 3.014 | 0.746 |
| | 20cm | 67/173 | 4.372 | 3.661 | 0.755 |