**Supplementary material**

Table S1. Taxonomic identification of the soil filamentous fungi used in this study, and accession numbers. The order of species in the table is by phylogeny. The neighbor-joining tree was based on the ITS (intergenic transcribed spacer) and a part of the large rRNA subunit (LSU). Phylogenetic annotations were based on bootstrap analysis, and assumed valid when supported in 80% of the bootstraps.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Strain ID** | **Genus species** | **Order** | **Phylum** | **NCBI Accession number** | **DSMZ** | **Partial 18s-, full ITS-, partial LSU sequence accession number** |
| RLCS09 | *Trametes versicolor* | Polyporales | Basidiomycota | KT582071 | DSM 100406 | MT453293 |
| RLCS16 | *Pleurotus sapidus* | Agaricales | Basidiomycota | KT582080 | DSM 100408 | MT453295 |
| RLCS17 | *Clitopilus sp.* | Agaricales | Basidiomycota | KT582089 | DSM 100324 | MT453280 |
| RLCS29 | *Macrolepiota excoriata* | Agaricales | Basidiomycota | KT582069 | DSM 100288 | MT453273 |
| RLCS10 | *Alternaria alternata* | Pleosporales | Ascomycota | KT582078 | DSM 100286 | MT453271 |
| RLCS14 | *Didymellaceae* strain 2 | Pleosporales | Ascomycota | KT582077 | DSM 100404 | MT453301 |
| RLCS12 | *Didymellaceae* strain 1 | Pleosporales | Ascomycota | KT582079 | DSM 100405 | MT453292 |
| RLCS22 | *Paraphoma chrysanthemicola* | Pleosporales | Ascomycota | KT582091 | DSM 100401 | MT453289 |
| RLCS21 | *Pyrenochaetopsis leptospora* | Pleosporales | Ascomycota | KT582065 | DSM 100327 | MT453283 |
| RLCS31 | *Cyphellophora sp.* | Chaetothyriales | Ascomycota | KT582074 | DSM 100328 | MT453284 |
| RLCS30 | *Exophiala equina* | Chaetothyriales | Ascomycota | KT582075 | DSM 100291 | MT453276 |
| RLCS26 | *Tetracladium marchalianum* | Helotiales | Ascomycota | KT582084 | DSM 100330 | MT453286 |
| RLCS28 | *Tricladium sp.* | Helotiales | Ascomycota | KT582085 | DSM 100323 | MT453279 |
| RLCS07 | *Amphisphaeriaceae*strain 1 | Xylariales | Ascomycota | KT582088 | DSM 100284 | MT453269 |
| RLCS06 | *Chaetomium angustispirale* | Sordariales | Ascomycota | KT582096 | DSM 100400 | MT453288 |
| RLCS27 | *Thielavia inaequalis* | Sordariales | Ascomycota | KT582086 | DSM 100326 | MT453282 |
| RLCS13 | *Fusarium solani* | Hypocreales |  Ascomycota | KT582073 | DSM 100290 | MT453275 |
| RLCS32 | *Fusarium oxysporum* | Hypocreales | Ascomycota | KT582095 | DSM 100409 | MT453296  |
| RLCS18 | *Gibberella sp.* | Hypocreales | Ascomycota | KT582068 | DSM 100287 | MT453272 |
| RLCS05 | *Fusarium sp.* | Hypocreales | Ascomycota | KT582097 | DSM 100403 | MT453291 |
| RLCS08 | *Gibberella tricincta* | Hypocreales | Ascomycota | KT582087 | DSM 100325 | MT453281 |
| RLCS24 | *Metarhizium marquandii* | Hypocreales | Ascomycota | KT582066 | DSM 100410 | MT453297 |
| RLCS23 | *Stachybotryaceae* strain 1 | Hypocreales | Ascomycota | KT582090 | DSM 101519 | MT453299 |
| RLCS20 | *Purpureocillium lilacinum* | Hypocreales | Ascomycota | KT582081 | DSM 100329 | MT453285 |
| RLCS25 | *Hydropisphaera* sp. | Hypocreales | Ascomycota | KT582083 | DSM 100292 | MT453277 |
| RLCS11 | *Mortierella alpina*strain 2 | Mortierellales | Mucoromycota | KT582070 | DSM 100289 | MT453274 |
| RLCS03 | *Mortierella alpina*strain 1 | Mortierellales | Mucoromycota | KT582067 | DSM 100285 | MT453270 |
| RLCS04 | *Mortierella exigua* | Mortierellales | Mucoromycota | KT582094 | DSM 100322 | MT453300 |
| RLCS02 | *Mortierella elongata*strain 1 | Mortierellales | Mucoromycota | KT582072 | DSM 100407 | MT453294 |
| RLCS15 | *Mortierella elongata*strain 2 | Mortierellales | Mucoromycota | KT582092 | DSM 100402 | MT453290 |
| RLCS01 | *Mucor fragilis* | Mucorales | Mucoromycota | KT582076 | DSM 100293 | MT453278 |
| RLCS19 | *Umbelopsis isabellina* | Umbelopsidales | Mucoromycota | KT582093 | DSM 100331 | MT453287 |

Table S2. Analysis of variance (full result table) - effects of mild (M, yes/no), strong (S, yes/no) and both heat stress events (MS).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Isolate** | **Source** | **df** | **Sum Sq** | **Mean Sq** | **F** | **p-value** | **p-value** (Benjamini- Hochberg corrected) |
| RLCS09 | Mild | 1 | 0.0001 | 0.0001  | 0.0010  | 0.9800 | 0.9804 |
| Strong | 1 | 0.0010 | 0.0010  | 0.0060 | 0.9410 | 0.9715 |
| Mild:Strong | 1 | 0.0086 | 0.0086  | 0.0520  | 0.8250 | 0.8515 |
| Residuals | 8 | 1.3180 | 0.1648  |   |   |   |
| RLCS16 | Mild | 1 | 0.2032  | 0.2032  | 0.6400 | 0.4470 | 0.5719 |
| Strong | 1 | 0.6006  | 0.6006  | 1.8910 | 0.2060 | 0.2445 |
| Mild:Strong | 1 | 0.0196  | 0.0196  | 0.0620 | 0.8100 | 0.8515 |
| Residuals | 8 | 2.5402  | 0.3175  |   |   |   |
| RLCS17 | Mild | 1 | 0.1859  | 0.1859  | 1.9410 | 0.2011  | 0.3762 |
| Strong | 1 | 1.8360  | 1.8360  | 19.1610 | 0.0024 | 0.0051 |
| Mild:Strong | 1 | 1.4457  | 1.4457  | 15.0890 | 0.0047 | 0.0106 |
| Residuals | 8 | 0.7665  | 0.0958  |   |   |   |
| RLCS29 | Mild | 1 | 0.0002  | 0.0002  | 0.0090 | 0.9284 | 0.9583 |
| Strong | 1 | 1.2452  | 1.2452  | 61.8610 | 0.0000 | 0.0002 |
| Mild:Strong | 1 | 0.5081 | 0.5081  | 25.2420 | 0.0010 | 0.0036 |
| Residuals | 8 | 0.1610  | 0.0201  |   |   |   |
| RLCS10 | Mild | 1 | 1.3588  | 1.3588  | 10.755 | 0.0112 | 0.0298 |
| Strong | 1 | 1.1644  | 1.1644  | 9.216 | 0.0162 | 0.0246 |
| Mild:Strong | 1 | 0.8195  | 0.8195  | 6.486 | 0.0343 | 0.0630 |
| Residuals | 8 | 1.0107  | 0.1263  |   |   |   |
| RLCS14 | Mild | 1 | 1.3975  | 1.3975  | 26.143 | 0.0009 | 0.0038 |
| Strong | 1 | 0.1453  | 0.1453  | 2.718 | 0.1379 | 0.1764 |
| Mild:Strong | 1 | 0.7877  | 0.7877  | 14.737 | 0.0050 | 0.0106 |
| Residuals | 8 | 0.4276  | 0.0535  |   |   |   |
| RLCS12 | Mild | 1 | 8.662  | 8.662  | 63.93 | 0.0000 | 0.0012 |
| Strong | 1 | 6.836  | 6.836  | 50.45 | 0.0001 | 0.0004 |
| Mild:Strong | 1 | 5.019  | 5.019  | 37.04 | 0.0003 | 0.0019 |
| Residuals | 8 | 1.084  | 0.135  |   |   |   |
| RLCS22 | Mild | 1 | 0.00792 | 0.00792  | 0.234 | 0.6413  | 0.7329 |
| Strong | 1 | 0.23339 | 0.23339  | 6.909 | 0.0302 | 0.0440 |
| Mild:Strong | 1 | 0.06915 | 0.06915  | 2.047 | 0.1904  | 0.2437 |
| Residuals | 8 | 0.27023 | 0.03378  |   |   |   |
| RLCS21 | Mild | 1 | 0.262  | 0.262  | 1.640 | 0.2362 | 0.3978 |
| Strong | 1 | 7.050  | 7.050  | 44.196 | 0.0002 | 0.0005 |
| Mild:Strong | 1 | 0.468  | 0.468  | 2.931 | 0.1253 | 0.1783 |
| Residuals | 8 | 1.276  | 0.160  |   |   |   |
| RLCS31 | Mild | 1 | 0.0028  | 0.0028  | 0.396  | 0.5470 | 0.6479 |
| Strong | 1 | 0.8361  | 0.8361 | 119.363 | 0.0000 | 0.0000 |
| Mild:Strong | 1 | 0.0277  | 0.0277  | 3.952  | 0.0820 | 0.1250 |
| Residuals | 8 | 0.0560  | 0.0070  |   |   |   |
| RLCS30 | Mild | 1 | 0.0237  | 0.0237  | 1.415  | 0.2680 | 0.4295 |
| Strong | 1 | 1.7176  | 1.7176 | 102.664 | 0.0000 | 0.0001 |
| Mild:Strong | 1 | 0.0098  | 0.0098  | 0.586  | 0.4660 | 0.5521 |
| Residuals | 8 | 0.1338  | 0.0167  |   |   |   |
| RLCS26 | Mild | 1 | 0.031  | 0.031  | 15.26  | 0.0045 | 0.0144 |
| Strong | 1 | 6.041  | 6.041 | 2933.9 | 0.0000 | 0.0000 |
| Mild:Strong | 1 | 0.031  | 0.031  | 15.26  | 0.0045 | 0.0106 |
| Residuals | 8 | 0.016  | 0.002 |   |   |   |
| RLCS28 | Mild | 1 | 0.0069  | 0.0069  | 1.041  | 0.3380 | 0.5079 |
| Strong | 1 | 0.8194  | 0.8194 | 123.113 | 0.0000 | 0.0000 |
| Mild:Strong | 1 | 0.4651  | 0.4651  | 69.885 | 0.0000 | 0.0003 |
| Residuals | 8 | 0.0532  | 0.0067  |   |   |   |
| RLCS07 | Mild | 1 | 3.202  | 3.202  | 10.420 | 0.0121 | 0.0298 |
| Strong | 1 | 5.357  | 5.357  | 17.434 | 0.0031 | 0.0062 |
| Mild:Strong | 1 | 0.037  | 0.037  | 0.121 | 0.7367  | 0.8419 |
| Residuals | 8 | 2.458  | 0.307  |   |   |   |
| RLCS06 | Mild | 1 | 2.021  | 2.021  | 7.868 | 0.0230 | 0.0526 |
| Strong | 1 | 4.909  | 4.909  | 19.109 | 0.0024 | 0.0051 |
| Mild:Strong | 1 | 8.495  | 8.495  | 33.068 | 0.0004 | 0.0023 |
| Residuals | 8 | 2.055  | 0.257  |   |   |   |
| RLCS27 | Mild | 1 | 0.062  | 0.062  | 0.989  | 0.3490 | 0.5079 |
| Strong | 1 | 0.048  | 0.048  | 0.772  | 0.4050 | 0.4471 |
| Mild:Strong | 1 | 3.431  | 3.431  | 55.078 | 0.0001 | 0.0006 |
| Residuals | 8 | 0.498  | 0.062  |   |   |   |
| RLCS13 | Mild | 1 | 0.0005  | 0.0005  | 0.011 | 0.9194 | 0.9583 |
| Strong | 1 | 0.5548  | 0.5548  | 11.288 | 0.0099 | 0.0177 |
| Mild:Strong | 1 | 1.1999  | 1.1999  | 24.413 | 0.0011 | 0.0036 |
| Residuals | 8 | 0.3932  | 0.0491  |   |   |   |
| RLCS32 | Mild | 1 | 4.354  | 4.354  | 26.68 | 0.0009 | 0.0038 |
| Strong | 1 | 7.726  | 7.726  | 47.34 | 0.0001 | 0.0004 |
| Mild:Strong | 1 | 23.841  | 23.841  | 146.09 | 0.0000 | 0.0000 |
| Residuals | 8 | 1.306  | 0.163  |   |   |   |
| RLCS18 | Mild | 1 | 2.020  | 2.0197  | 4.918 | 0.0574 | 0.1148 |
| Strong | 1 | 0.000  | 0.0000  | 0.000 | 0.9981  | 0.9981 |
| Mild:Strong | 1 | 1.024  | 1.0240  | 2.493 | 0.1530  | 0.2040 |
| Residuals | 8 | 3.286  | 0.4107  |   |   |   |
| RLCS05 | Mild | 1 | 1.258  | 1.258  | 25.752  | 0.0010 | 0.0038 |
| Strong | 1 | 0.296  | 0.296  | 6.063  | 0.0392 | 0.0545 |
| Mild:Strong | 1 | 15.640  | 15.640 | 320.178 | 0.0000 | 0.0000 |
| Residuals | 8 | 0.391  | 0.049  |   |   |   |
| RLCS08 | Mild | 1 | 3.749  | 3.749  | 33.25 | 0.0004 | 0.0034 |
| Strong | 1 | 1.682  | 1.682  | 14.92 | 0.0048 | 0.0090 |
| Mild:Strong | 1 | 2.783  | 2.783  | 24.68 | 0.0011 | 0.0036 |
| Residuals | 8 | 0.902  | 0.113  |   |   |   |
| RLCS24 | Mild | 1 | 0.09973 | 0.0997  | 5.246 | 0.0512 | 0.1093 |
| Strong | 1 | 0.19504 | 0.1950  | 10.259 | 0.0126 | 0.0211 |
| Mild:Strong | 1 | 0.20134 | 0.2013  | 10.590 | 0.0116 | 0.0233 |
| Residuals | 8 | 0.15210 | 0.0190  |   |   |   |
| RLCS23 | Mild | 1 | 0.648  | 0.648  | 0.839 | 0.3865  | 0.5154 |
| Strong | 1 | 3.965  | 3.965  | 5.129 | 0.0533 | 0.0711 |
| Mild:Strong | 1 | 0.043  | 0.043  | 0.055 | 0.8198  | 0.8515 |
| Residuals | 8 | 6.184  | 0.773  |   |   |   |
| RLCS20 | Mild | 1 | 0.0858 | 0.0858  | 1.844 | 0.2116  | 0.3762 |
| Strong | 1 | 0.0477 | 0.0477  | 1.024 | 0.3413  | 0.3900 |
| Mild:Strong | 1 | 0.2935 | 0.2935  | 6.305 | 0.0363 | 0.0630 |
| Residuals | 8 | 0.3724 | 0.0466  |   |   |   |
| RLCS25 | Mild | 1 | 0.413  | 0.4126  | 0.892  | 0.3730 | 0.5154 |
| Strong | 1 | 1.125  | 1.1255  | 2.433  | 0.1570 | 0.1937 |
| Mild:Strong | 1 | 0.689  | 0.6888  | 1.489  | 0.2570 | 0.3164 |
| Residuals | 8 | 3.700  | 0.4625  |   |   |   |
| RLCS11 | Mild | 1 | 6.853  | 6.853  | 55.56 | 0.0001 | 0.0012 |
| Strong | 1 | 8.289  | 8.289  | 67.20 | 0.0000 | 0.0002 |
| Mild:Strong | 1 | 3.754  | 3.754  | 30.43 | 0.0006 | 0.0026 |
| Residuals | 8 | 0.987  | 0.123  |   |   |   |
| RLCS03 | Mild | 1 | 18.31  | 18.31  | 15.27 | 0.0045 | 0.0144 |
| Strong | 1 | 34.08  | 34.08  | 28.43 | 0.0007 | 0.0017 |
| Mild:Strong | 1 | 20.34  | 20.34  | 16.96 | 0.0033 | 0.0089 |
| Residuals | 8 | 9.59  | 1.20  |   |   |   |
| RLCS04 | Mild | 1 | 76.09  | 76.09  | 30.594 | 0.0006 | 0.0035 |
| Strong | 1 | 76.09  | 76.09  | 30.594 | 0.0006 | 0.0002 |
| Mild:Strong | 1 | 7.16  | 7.16  | 2.879 | 0.1282 | 0.1783 |
| Residuals | 8 | 19.90  | 2.49  |   |   |   |
| RLCS02 | Mild | 1 | 40.87  | 40.87  | 40.32 | 0.0002 | 0.0024 |
| Strong | 1 | 56.10  | 56.10  | 55.34 | 0.0001 | 0.0003 |
| Mild:Strong | 1 | 23.09  | 23.09  | 22.78 | 0.0014 | 0.0041 |
| Residuals | 8 | 8.11  | 1.01  |   |   |   |
| RLCS15 | Mild | 1 | 11.360  | 11.360  | 13.858 | 0.0058 | 0.0170 |
| Strong | 1 | 23.689  | 23.689  | 28.896 | 0.0007 | 0.0017 |
| Mild:Strong | 1 | 5.092  | 5.092  | 6.211 | 0.0374 | 0.0630 |
| Residuals | 8 | 6.558  | 0.820  |   |   |   |
| RLCS01 | Mild | 1 | 0.521  | 0.521  | 0.527 | 0.4884  | 0.6011 |
| Strong | 1 | 0.067  | 0.067  | 0.068 | 0.8004  | 0.8537 |
| Mild:Strong | 1 | 4.563  | 4.563  | 4.621 | 0.0638 | 0.1021 |
| Residuals | 8 | 7.900  | 0.987  |   |   |   |
| RLCS19 | Mild | 1 | 0.0037  | 0.0037  | 0.016 | 0.9033  | 0.9583 |
| Strong | 1 | 2.2963  | 2.2963  | 9.933 | 0.0161 | 0.0246 |
| Mild:Strong | 1 | 0.0067  | 0.0067  | 0.029 | 0.8700  | 0.8700 |
| Residuals | 8 | 1.6183  | 0.2312  |   |    |    |

Figure S1. Response categories and full data for of all 32 fungal isolates (based on colony extension rate) to recurrent heat pulse perturbations: synergy, antagony, and additive response.

