**Table S2**. Pearson’s correlation of dominant phyla (relative abundance > 0.1%), classes (> 0.03%), orders (> 0.1%) and genera (0.3%) with environmental variables

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Phylum** | pH | Mositure | TC | TN | TP | TK | NH4+–N | NO3––N | AP | AK | Year |
| Ascomycota | 0.316 | –0.325 | –0.631\*\* | –0.014 | 0.223 | 0.561\*\* | 0.090 | –0.303 | 0.176 | –0.054 | 0.193 |
| Zygomycota | 0.244 | 0.249 |  0.620\*\* |  0.303 | –0.669\*\* | –0.391 | –0.226 | 0.258 | –0.556\*\* | 0.096 | 0.239 |
| Basidiomycota | –0.759\*\* | 0.098 | –0.037 | –0.225 | 0.443\* | 0.042 | 0.116 | 0.053 | 0.466\* | –0.008 | –0.432 |
| Chytridiomycota | 0.637\*\* | –0.189 | 0.338 | 0.119 | –0.279 | –0.316 | –0.115 | –0.169 | –0.328 | –0.207 | 0.121 |
| **Class** |  |  |  |  |  |  |  |  |  |  |  |
| Sordariomycetes | 0.415  | –0.137  | –0.011  | 0.003  | 0.085  | –0.320  | 0.291  | –0.142  | –0.156  | 0.047  | –0.025  |
| Incertae sedis | 0.285  | 0.142  | 0.452\* | 0.096  | –0.540\* | –0.286  | –0.075  | 0.270  | –0.383  | 0.029  | 0.215  |
| Dothideomycetes | –0.102  | –0.368  | –0.586\*\* | –0.188  | 0.428  | 0.455\* | –0.080  | –0.265  | 0.372  | –0.294  | –0.326  |
| Eurotiomycetes | 0.574\*\* | –0.092  | –0.042  | 0.226  | –0.412  | 0.329  | –0.047  | 0.097  | –0.248  | 0.034  | 0.461\* |
| Leotiomycetes | 0.418  | –0.568\*\* | –0.833\*\* | –0.706\*\* | 0.366  | 0.623\*\* | 0.174  | –0.163  | 0.412  | –0.552\*\* | –0.155  |
| Agaricomycetes | 0.246  | 0.544\* | 0.284  | 0.597\*\* | –0.727\*\* | –0.322  | –0.138  | 0.376  | –0.796\*\* | 0.650\*\* | 0.681\*\* |
| Tremellomycetes | –0.638\*\* | –0.227  | –0.174  | –0.418  | 0.644\*\* | 0.163  | 0.088  | –0.140  | 0.678\*\* | –0.302  | –0.612\*\* |
| Pezizomycetes | 0.406  | –0.389  | –0.449\* | –0.583\*\* | 0.167  | 0.527\* | 0.108  | –0.125  | 0.352  | –0.364  | 0.158  |
| Chytridiomycetes | 0.397  | –0.059  | 0.347  | 0.227  | –0.241  | –0.505\* | –0.184  | –0.053  | –0.373  | 0.045  | 0.196  |
| Wallemiomycetes | 0.284  | 0.243  | 0.096  | 0.241  | –0.624\*\* | –0.169  | –0.282  | 0.003  | –.535\* | 0.276  | 0.582\*\* |
| Microbotryomycetes | –0.216  | 0.313  | 0.016  | –0.047  | –0.315  | 0.102  | –0.081  | 0.350  | –0.204  | 0.160  | 0.129  |
| Orbiliomycetes | 0.314  | 0.124  | 0.217  | 0.248  | –0.326  | –0.104  | –0.228  | 0.268  | –0.306  | –0.213  | –0.114  |
| Glomeromycetes | 0.272  | 0.022  | 0.124  | 0.203  | –0.293  | –0.118  | –0.092  | –0.105  | –0.447\* | –0.070  | 0.013  |
| **Order** |  |  |  |  |  |  |  |  |  |  |  |
| Hypocreales | 0.541\* | 0.117  | 0.142  | 0.505\* | –0.461\* | –0.065  | –0.159  | 0.001  | –0.400  | 0.252  | 0.518\* |
| Mortierellales | 0.269  | 0.162  | 0.513\* | 0.200  | –0.614\*\* | –0.302  | –0.144  | 0.225  | –0.469\* | 0.021  | 0.221  |
| Sordariales | –0.402  | –0.068  | 0.034  | –0.311  | 0.480\* | –0.269  | 0.523\* | 0.012  | 0.182  | –0.037  | –0.505\* |
| Pleosporales | –0.075  | –0.371  | –0.627\*\* | –0.182  | 0.395  | 0.477\* | –0.106  | –0.290  | 0.353  | –0.288  | –0.279  |
| Thelebolales | 0.232  | –0.726\*\* | –0.702\*\* | –0.851\*\* | 0.756\*\* | 0.514\* | 0.180  | –0.483\* | 0.804\*\* | –0.745\*\* | –.445\* |
| Eurotiales | 0.440\* | 0.124  | 0.019  | 0.394  | –0.460\* | 0.378  | –0.135  | 0.322  | –0.260  | 0.218  | 0.624\*\* |
| Tremellales | 0.278  | –0.079  | 0.004  | –0.102  | –0.315  | 0.059  | 0.274  | 0.290  | –0.322  | 0.137  | 0.309  |
| Russulales | 0.395  | 0.164  | 0.479\* | 0.595\*\* | –0.562\*\* | –0.282  | –0.175  | 0.115  | –0.526\* | 0.192  | 0.285  |
| Incertae sedis | 0.094  | –0.053  | –0.063  | –0.014  | –0.035  | –0.167  | 0.070  | –0.027  | –0.224  | 0.048  | 0.015  |
| Agaricales | 0.262  | 0.547\* | 0.634\*\* | 0.647\*\* | –0.726\*\* | –0.379  | –0.297  | 0.182  | –0.684\*\* | 0.476\* | 0.597\*\* |
| Microascales | 0.268  | 0.044  | 0.339  | –0.065  | –0.082  | –0.365  | 0.360  | –0.002  | –0.233  | 0.138  | 0.068  |
| Pezizales | 0.525\* | –0.437\* | –0.531\* | –0.528\* | 0.160  | 0.554\*\* | 0.109  | –0.219  | 0.345  | –0.340  | 0.259  |
| Xylariales | 0.355  | 0.260  | 0.417  | 0.535\* | –0.650\*\* | –0.306  | 0.029  | 0.130  | –0.707\*\* | 0.401  | 0.444\* |
| Chaetothyriales | 0.481\* | 0.304  | 0.034  | 0.425  | –0.765\*\* | 0.103  | –0.120  | 0.463\* | –0.688\*\* | 0.319  | 0.550\*\* |
| Cystofilobasidiales | –0.631\*\* | –0.203  | –0.191  | –0.399  | 0.689\*\* | 0.172  | 0.035  | –0.211  | 0.733\*\* | –0.324  | –0.612\*\* |
| Helotiales | 0.321  | –0.279  | –0.600\*\* | –0.420  | 0.139  | 0.452\* | 0.326  | –0.055  | –0.040  | –0.286  | –0.222  |
| Capnodiales | 0.137  | –0.118  | –0.315  | –0.203  | 0.172  | 0.005  | 0.374  | 0.064  | –0.182  | –0.013  | –0.210  |
| Onygenales | 0.374  | –0.609\*\* | –0.111  | –0.356  | 0.292  | 0.152  | 0.025  | –0.612\*\* | 0.483\* | –0.513\* | –0.122  |
| Cantharellales | 0.053  | 0.066  | –0.334  | 0.137  | –0.103  | 0.140  | 0.089  | 0.033  | –0.376  | 0.183  | –0.001  |
| Kickxellales | 0.544\* | –0.218  | 0.195  | 0.083  | –0.288  | –0.250  | –0.204  | –0.253  | –0.212  | –0.207  | 0.141  |
| Rhizophlyctidales | –0.003  | –0.295  | –0.284  | –0.259  | 0.420  | –0.051  | 0.219  | –0.400  | 0.106  | –0.118  | –0.355  |
| Basidiobolales | 0.171  | 0.101  | 0.191  | 0.061  | –0.045  | –0.302  | 0.088  | 0.043  | –0.142  | 0.290  | 0.360  |
| Coniochaetales | –0.045  | –0.381  | –0.738\*\* | –0.352  | 0.574\*\* | 0.513\* | 0.191  | –0.236  | 0.429  | –0.219  | –0.274  |
| Spizellomycetales | 0.340  | –0.273  | –0.197  | –0.163  | 0.002  | –0.084  | –0.137  | –0.203  | –0.236  | –0.226  | –0.182  |
| Olpidiales | –0.058  | 0.564\*\* | 0.730\*\* | 0.586\*\* | –0.537\* | –0.438\* | –0.012  | 0.316  | –0.452\* | 0.495\* | 0.487\* |
| **Genus** |  |  |  |  |  |  |  |  |  |  |  |
| *Guehomyces* | –0.655\*\* | 0.050  | 0.030  | –0.320  | 0.475\* | –0.011  | 0.023  | –0.014  | 0.497\* | –0.251  | –0.595\*\* |
| Ascomycota\_Unclassified | –0.602\*\* | 0.440\* | 0.283  | 0.025  | 0.121  | –0.272  | –0.012  | 0.186  | 0.160  | 0.054  | –0.282  |
| *Mortierella* | 0.269  | 0.163  | 0.515\* | 0.202  | –0.614\*\* | –0.303  | –0.147  | 0.225  | –0.470\* | 0.022  | 0.222  |
| *Leptosphaerulina* | –0.333  | –0.172  | –0.310  | –0.063  | 0.511\* | 0.256  | 0.051  | –0.305  | 0.486\* | –0.181  | –0.419  |
| unidentified | 0.032  | –0.349  | 0.239  | –0.418  | 0.368  | –0.366  | 0.195  | –0.200  | 0.123  | –0.353  | –0.551\*\* |
| Nectriaceae\_Unclassified | –0.029  | –0.150  | –0.106  | 0.088  | 0.123  | 0.379  | –0.327  | –0.346  | 0.403  | –0.163  | 0.078  |
| *Gibberella* | –0.047  | 0.164  | –0.073  | 0.018  | –0.267  | 0.042  | 0.220  | 0.466\* | –0.261  | 0.378  | 0.420  |
| Fungi\_Unclassified | 0.551\*\* | –0.175  | –0.149  | –0.139  | –0.133  | 0.135  | 0.430  | 0.183  | –0.304  | –0.075  | 0.107  |
| *Cryptococcus* | 0.276  | –0.080  | –0.001  | –0.107  | –0.311  | 0.064  | 0.276  | 0.288  | –0.319  | 0.134  | 0.306  |
| Chaetomiaceae\_Unclassified | –0.220  | 0.033  | 0.156  | –0.389  | 0.249  | –0.320  | 0.294  | 0.090  | 0.017  | –0.271  | –0.604\*\* |
| *Chaetomium* | –0.513\* | 0.127  | 0.241  | –0.125  | 0.330  | –0.529\* | 0.173  | –0.067  | 0.050  | –0.109  | –0.645\*\* |
| *Doratomyces* | –0.233  | 0.480\* | 0.477\* | 0.260  | –0.534\* | –0.302  | –0.065  | 0.521\* | –0.430  | 0.371  | 0.194  |
| *Cladosporium* | –0.043  | 0.006  | 0.018  | 0.007  | 0.147  | –0.230  | 0.342  | 0.099  | –0.186  | 0.125  | –0.207  |
| *Fusarium* | 0.006  | –0.056  | –0.073  | 0.066  | 0.249  | –0.129  | 0.446\* | –0.165  | –0.095  | 0.310  | 0.001  |
| *Penicillium* | 0.470\* | 0.029  | 0.390  | 0.194  | –0.278  | –0.220  | –0.008  | –0.161  | –0.275  | –0.071  | 0.208  |
| *Alternaria* | –0.403  | 0.303  | 0.166  | 0.225  | –0.120  | –0.409  | 0.062  | 0.416  | –0.398  | 0.402  | –0.014  |
| Sordariomycetes\_Unclassified | –0.046  | –0.155  | –0.447\* | –0.124  | 0.204  | 0.535\* | –0.151  | –0.153  | 0.517\* | 0.029  | 0.364  |
| Sporormiaceae\_Unclassified | –0.298  | –0.403  | –0.419  | –0.421  | 0.865\*\* | 0.210  | 0.239  | –0.572\*\* | 0.755\*\* | –0.327  | –0.530\* |
| *Preussia* | –0.262  | –0.483\* | –0.504\* | –0.519\* | 0.692\*\* | 0.296  | 0.333  | –0.358  | 0.515\* | –0.393  | –0.621\*\* |
| Thelebolales\_Unclassified | 0.240  | –0.725\*\* | –0.684\*\* | –0.848\*\* | 0.757\*\* | 0.507\* | 0.162  | –0.493\* | 0.807\*\* | –0.758\*\* | –0.449\* |
| *Phaeomycocentrospora* | 0.377  | 0.413  | 0.215  | 0.585\*\* | –0.855\*\* | 0.034  | –0.332  | 0.547\* | –0.641\*\* | 0.486\* | 0.864\*\* |
| Lasiosphaeriaceae\_Unclassified | –0.064  | –0.581\*\* | –0.434\* | –0.750\*\* | 0.797\*\* | 0.149  | 0.451\* | –0.435\* | 0.600\*\* | –0.482\* | –0.598\*\* |
| *Conocybe* | –0.206  | 0.507\* | 0.614\*\* | 0.260  | –0.409  | –0.419  | –0.266  | 0.377  | –0.319  | 0.257  | 0.170  |
| *Leptosphaeria* | –0.281  | 0.146  | 0.063  | 0.069  | 0.042  | 0.142  | –0.250  | 0.158  | 0.263  | 0.119  | 0.119  |
| *Haematonectria* | 0.174  | 0.654\*\* | 0.408  | 0.773\*\* | –0.922\*\* | –0.162  | –0.188  | 0.500\* | –0.783\*\* | 0.756\*\* | 0.886\*\* |
| *Nectria* | 0.333  | –0.007  | –0.017  | 0.250  | –0.383  | –0.003  | –0.332  | –0.130  | –0.172  | 0.014  | 0.351  |
| Eurotiomycetes\_Unclassified | 0.026  | 0.309  | 0.155  | 0.218  | –0.535\* | 0.157  | 0.123  | 0.345  | –0.479\* | 0.208  | 0.299  |
| *Schizothecium* | –0.014  | –0.356  | –0.347  | –0.685\*\* | 0.494\* | 0.212  | 0.260  | –0.188  | 0.394  | –0.372  | –0.314  |
| *Paecilomyces* | 0.124  | 0.549\*\* | 0.140  | 0.667\*\* | –0.799\*\* | 0.131  | –0.235  | 0.490\* | –0.548\* | 0.630\*\* | 0.839\*\* |
| *Tetracladium* | 0.352  | –0.185  | –0.585\*\* | –0.302  | –0.001  | 0.425  | 0.249  | 0.126  | –0.165  | –0.162  | –0.073  |
| *Phoma* | 0.386  | –0.403  | –.547\* | –0.420  | 0.102  | 0.320  | –0.090  | –0.152  | 0.004  | –0.429  | –0.097  |
| *Stachybotrys* | –0.107  | –0.270  | –0.297  | –0.370  | 0.552\*\* | –0.024  | 0.442\* | –0.377  | 0.212  | –0.049  | –0.380  |
| *Cercophora* | –0.054  | –0.509\* | –0.356  | –0.592\*\* | 0.708\*\* | 0.061  | 0.025  | –0.593\*\* | 0.561\*\* | –0.517\* | –0.502\* |
| *Humicola* | 0.453\* | –0.309  | 0.000  | –0.193  | 0.004  | –0.125  | –0.058  | –0.378  | –0.104  | –0.330  | 0.011  |
| Pleosporales\_Unclassified | 0.332  | 0.136  | 0.077  | 0.407  | –0.455\* | –0.048  | –0.252  | 0.128  | –0.440\* | 0.080  | 0.176  |
| Incertae sedis\_Unclassified | 0.254  | –0.098  | –0.473\* | 0.057  | –0.260  | 0.368  | 0.222  | 0.163  | –0.305  | 0.270  | 0.429  |
| *Metarhizium* | 0.173  | –0.413  | 0.053  | –0.529\* | 0.285  | –0.060  | 0.157  | –0.178  | 0.324  | –0.400  | –0.198  |
| *Epicoccum* | –0.303  | 0.303  | 0.436\* | 0.205  | –0.324  | –0.221  | –0.032  | 0.538\* | –0.290  | 0.039  | –0.182  |

\*\* Correlation is significant at *P* = 0.01 level. \* Significant at *P* = 0.05 level