|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Taxa** | **Group** | **Group** | **Contrib. %** | **Taxa** | **Group** | **Group** | **Contrib. %** |
| **Av. Diss. = 73.32%** | **December\_2009** | **April\_2010** |  | *Fusarium acuminatum* | 0.00 | 0.32 | 1.01 |
| Oomycota | 0.61 | 2.27 | 5.63 | *Fusarium sporotrichiodes* | 0.00 | 0.34 | 0.98 |
| *Trichoderma hamatum* | 2.29 | 1.34 | 4.22 | *Eupenicillium javanicum* | 0.00 | 0.33 | 0.96 |
| *Fusarium oxysporum* | 1.01 | 0.93 | 3.81 | *Alternaria tenusissima* | 0.35 | 0.00 | 0.95 |
| *Rhizopus stolonifer* | 0.91 | 0.97 | 3.66 | *Acremonium kiliense* | 0.08 | 0.28 | 0.94 |
| *Botryothichum piluliferum* | 0.08 | 1.16 | 3.58 | *Fusarium konzum* | 0.20 | 0.17 | 0.87 |
| *Trichoderma koningii* | 1.05 | 0.68 | 3.36 | *Penicillium expansum* | 0.25 | 0.08 | 0.85 |
| *Trichoderma harzianum* | 0.79 | 0.49 | 2.97 | *Trichocladium opacum* | 0.28 | 0.00 | 0.84 |
| *Fusarium solani* | 0.47 | 0.80 | 2.80 | *Penicillium rubrum* | 0.28 | 0.00 | 0.84 |
| *Penicillium citrinum* | 0.84 | 0.74 | 2.76 | *Aspergillus niger* | 0.08 | 0.25 | 0.83 |
| *Trichoderma strigosum* | 0.74 | 0.22 | 2.70 | *Epicoccum nigrum* | 0.00 | 0.28 | 0.77 |
| *Micelia sterilia* | 1.28 | 1.02 | 2.55 | *Acremonium fuscolum* | 0.25 | 0.00 | 0.76 |
| *Fusarium sambucinum* | 0.50 | 0.45 | 2.27 | *Penicillium funiculosum* | 0.00 | 0.25 | 0.72 |
| *Humicola griseae* | 0.25 | 0.60 | 1.99 | *Fusarium subglutinans* | 0.2 | 0.08 | 0.72 |
| *Aspergillus fumigatus* | 0.60 | 0.42 | 1.96 | *Trichoderma aureoviridae* | 0.00 | 0.23 | 0.71 |
| *Trichoderma polysporum* | 0.41 | 0.28 | 1.90 | *Fusarium chlamydosporum* | 0.00 | 0.24 | 0.67 |
| *Emericella nivea* | 0.17 | 0.45 | 1.82 | *Trichoderma longibrachiatum* | 0.08 | 0.14 | 0.65 |
| *Humicola fuscoastra* | 0.44 | 0.20 | 1.81 | *Fusarium merismoides* | 0.00 | 0.24 | 0.64 |
| *Cylindrocarpon dydimun* | 0.50 | 0.28 | 1.81 | *Stachybotrys cylindrospora* | 0.12 | 0.12 | 0.63 |
| *Absidia glauca* | 0.12 | 0.51 | 1.74 | *Aspergillus flavus* | 0.08 | 0.17 | 0.62 |
| *Nectria ventricosa* | 0.12 | 0.52 | 1.73 | *Gliocladium roseum* | 0.23 | 0.00 | 0.62 |
| *Cladosporium cladosporioides* | 0.30 | 0.26 | 1.63 | *Idriella lunata* | 0.23 | 0.00 | 0.62 |
| *Trichoderma pseudokoningii* | 0.19 | 0.33 | 1.48 | **Av. Diss. = 72.07%** | **April\_2010** | **August\_2010** |  |
| *Gilmaniella humicola* | 0.37 | 0.25 | 1.44 | *Fusarium oxysporum* | 0.93 | 2.00 | 5.68 |
| *Penicillium restrictum* | 0.43 | 0.00 | 1.44 | *Rhizopus stolonifer* | 0.97 | 1.77 | 4.51 |
| *Mortierella vinacea* | 0.39 | 0.08 | 1.37 | *Trichoderma hamatum* | 1.34 | 0.59 | 3.68 |
| *Apiospora montagnei* | 0.08 | 0.39 | 1.28 | *Botryothichum piluliferum* | 1.16 | 0.08 | 3.60 |
| *Fusarium graminearum* | 0.20 | 0.25 | 1.22 | *Fusarium scirpi* | 0.14 | 1.00 | 3.45 |
| *Trichoderma viridae* | 0.12 | 0.31 | 1.21 | *Humicola griseae* | 0.60 | 1.11 | 3.44 |
| *Fusarium scirpi* | 0.26 | 0.14 | 1.12 | *Calicium* Pers. | 0.08 | 1.09 | 3.35 |
| *Trichoderma piluliferum* | 0.29 | 0.08 | 1.12 | *Oomycota* | 2.27 | 1.89 | 3.04 |
| *Penicillium expansum* | 0.25 | 0.17 | 1.08 | *Fusarium solani* | 0.80 | 0.27 | 2.61 |
| *Trichocladium opacum* | 0.28 | 0.08 | 1.04 | *Micelia sterilia* | 1.02 | 1.39 | 2.59 |
| *Alternaria tenusissima* | 0.35 | 0.00 | 1.04 | *Penicillium citrinum* | 0.74 | 0.46 | 2.47 |
| *Acremonium kiliense* | 0.08 | 0.28 | 1.02 | *Trichoderma koningii* | 0.68 | 0.23 | 2.36 |
| *Penicillium lilacinium* | 0.25 | 0.08 | 0.96 | *Aspergillus fumigatus* | 0.42 | 0.82 | 2.22 |
| *Aspergillus niger* | 0.08 | 0.25 | 0.92 | Levadura | 0.08 | 0.60 | 2.00 |
| *Penicillium rubrum* | 0.28 | 0.00 | 0.92 | *Trichoderma polysporum* | 0.28 | 0.43 | 1.91 |
| *Acremonium fuscolum* | 0.25 | 0.00 | 0.84 | *Absidia glauca* | 0.51 | 0.37 | 1.89 |
| *Idriella lunata* | 0.23 | 0.08 | 0.83 | *Trichoderma harzianum* | 0.49 | 0.33 | 1.89 |
| *Trichoderma longibrachiatum* | 0.08 | 0.20 | 0.79 | *Humicola fuscoastra* | 0.20 | 0.38 | 1.61 |
| *Cylindrocarpon magnusianum* | 0.00 | 0.27 | 0.75 | *Nectria ventricosa* | 0.52 | 0.00 | 1.52 |
| Levadura | 0.17 | 0.08 | 0.69 | *Emericella nivea* | 0.45 | 0.00 | 1.51 |
| *Gliocladium roseum* | 0.23 | 0.00 | 0.68 | *Fusarium crookwelense* | 0.08 | 0.43 | 1.45 |
| *Fusarium merismoides* | 0.00 | 0.20 | 0.67 | *Acremonium kiliense* | 0.28 | 0.28 | 1.38 |
| **Av. Diss. = 76.47%** | **December\_2009** | **August\_2010** |  | *Fusarium sambucinum* | 0.45 | 0.00 | 1.31 |
| *Trichoderma hamatum* | 2.29 | 0.59 | 5.24 | *Aspergillus niger* | 0.25 | 0.25 | 1.30 |
| *Fusarium oxysporum* | 1.01 | 2.00 | 4.94 | *Mortierella vinacea* | 0.08 | 0.39 | 1.29 |
| Oomycota | 0.61 | 1.89 | 4.19 | *Apiospora montagnei* | 0.39 | 0.08 | 1.28 |
| *Rhizopus stolonifer* | 0.91 | 1.77 | 4.06 | *Fusarium merismoides* | 0.20 | 0.24 | 1.26 |
| *Fusarium scirpi* | 0.26 | 1.00 | 3.30 | *Cylindrocarpon dydimun* | 0.28 | 0.14 | 1.22 |
| *Humicola griseae* | 0.25 | 1.11 | 3.19 | *Trichoderma viridae* | 0.31 | 0.08 | 1.13 |
| *Calicium* Pers. | 0.00 | 1.09 | 3.14 | *Fusarium acuminatum* | 0.00 | 0.32 | 1.12 |
| *Trichoderma koningii* | 1.05 | 0.23 | 3.03 | *Fusarium sporotrichiodes* | 0.00 | 0.34 | 1.09 |
| *Trichoderma harzianum* | 0.79 | 0.33 | 2.54 | *Eupenicillium javanicum* | 0.00 | 0.33 | 1.06 |
| *Penicillium citrinum* | 0.84 | 0.46 | 2.44 | *Cladosporium cladosporioides* | 0.26 | 0.08 | 1.03 |
| *Micelia sterilia* | 1.28 | 1.39 | 2.32 | *Trichoderma pseudokoningii* | 0.33 | 0.00 | 1.03 |
| *Trichoderma strigosum* | 0.74 | 0.00 | 2.19 | *Trichoderma piluliferum* | 0.08 | 0.27 | 1.02 |
| *Aspergillus fumigatus* | 0.60 | 0.82 | 2.08 | *Penicillium lilacinium* | 0.08 | 0.24 | 0.96 |
| *Trichoderma polysporum* | 0.41 | 0.43 | 2.02 | *Trichoderma longibrachiatum* | 0.20 | 0.14 | 0.95 |
| *Humicola fuscoastra* | 0.44 | 0.38 | 1.92 | *Penicillium funiculosum* | 0.08 | 0.25 | 0.91 |
| Levadura | 0.17 | 0.6 | 1.80 | *Alternaria alternata* | 0.12 | 0.20 | 0.88 |
| *Fusarium solani* | 0.47 | 0.27 | 1.78 | *Epicoccum nigrum* | 0.00 | 0.28 | 0.85 |
| *Cylindrocarpon dydimun* | 0.5 | 0.14 | 1.62 | *Gilmaniella humicola* | 0.25 | 0.00 | 0.85 |
| *Mortierella vinacea* | 0.39 | 0.39 | 1.62 | *Trichoderma aureoviridae* | 0.00 | 0.23 | 0.79 |
| *Penicillium restrictum* | 0.43 | 0.12 | 1.48 | *Cylindrocarpon magnusianum* | 0.27 | 0.00 | 0.76 |
| *Fusarium sambucinum* | 0.50 | 0.00 | 1.47 | **Av. Diss. = 83.71%** | **December\_2009** | **December\_2010** |  |
| *Trichoderma piluliferum* | 0.29 | 0.27 | 1.44 | *Trichoderma hamatum* | 2.29 | 0.08 | 5.83 |
| *Fusarium crookwelense* | 0.12 | 0.43 | 1.39 | *Fusarium oxysporum* | 1.01 | 1.53 | 3.69 |
| *Absidia glauca* | 0.12 | 0.37 | 1.26 | *Fusarium hostae* | 0.00 | 1.22 | 3.14 |
| *Penicillium lilacinium* | 0.25 | 0.24 | 1.17 | *Rhizopus stolonifer* | 0.91 | 0.78 | 2.98 |
| *Cladosporium cladosporioides* | 0.30 | 0.08 | 1.04 | *Micelia sterilia* | 1.28 | 1.78 | 2.88 |
| *Gilmaniella humicola* | 0.37 | 0.00 | 1.03 | *Trichoderma koningii* | 1.05 | 0.00 | 2.75 |

**Table 2.** SIMPER analysis for abundance composition of fungi of soil samples. Comparison between groups showing the average total dissimilarity (Av. Diss.) and the contribution of taxa to the dissimilarity (%). Results are given for pairwise comparisons between seasons (December\_2009, April\_2010, August\_2010 and December \_2010).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Taxa** | **Group** | **Group** | **Contrib. %** | **Taxa** | **Group** | **Group** | **Contrib. %** |
| *Fusarium solani* | 0.47 | 1.03 | 2.66 | *Emericella nivea* | 0.45 | 0.00 | 1.30 |
| *Penicillium thomii* | 0.00 | 0.99 | 2.38 | *Trichoderma harzianum* | 0.49 | 0.00 | 1.28 |
| *Calicium* Pers. | 0.00 | 0.88 | 2.28 | *Fusarium scirpi* | 0.14 | 0.37 | 1.23 |
| Oomycota | 0.61 | 0.83 | 2.23 | *Cladosporium cladosporioides* | 0.26 | 0.25 | 1.21 |
| *Penicillium funiculosum* | 0.00 | 0.90 | 2.20 | *Humicola fuscoastra* | 0.20 | 0.33 | 1.15 |
| *Penicillium citrinum* | 0.84 | 0.00 | 2.18 | *Fusarium sambucinum* | 0.45 | 0.00 | 1.14 |
| *Epicoccum nigrum* | 0.00 | 0.87 | 2.17 | *Apiospora montagnei* | 0.39 | 0.08 | 1.10 |
| *Trichoderma harzianum* | 0.79 | 0.00 | 2.12 | *Trichoderma polysporum* | 0.28 | 0.12 | 1.01 |
| *Aspergillus fumigatus* | 0.60 | 1.28 | 2.08 | *Trichoderma pseudokoningii* | 0.33 | 0.00 | 0.89 |
| Levadura | 0.17 | 0.77 | 1.98 | *Cylindrocarpon dydimun* | 0.28 | 0.08 | 0.88 |
| *Trichoderma strigosum* | 0.74 | 0.00 | 1.95 | *Trichoderma viridae* | 0.31 | 0.00 | 0.79 |
| *Humicola griseae* | 0.25 | 0.82 | 1.93 | *Penicillium lilacinium* | 0.08 | 0.20 | 0.75 |
| *Eupenicillium javanicum* | 0.00 | 0.68 | 1.73 | *Fusarium proliferatum* | 0.00 | 0.25 | 0.75 |
| *Stachybotrys chartarum* | 0.17 | 0.63 | 1.63 | *Gilmaniella humicola* | 0.25 | 0.00 | 0.73 |
| *Aspergillus niger* | 0.08 | 0.60 | 1.54 | *Fusarium chlamydosporum* | 0.00 | 0.25 | 0.73 |
| *Humicola fuscoastra* | 0.44 | 0.33 | 1.53 | *Aspergillus candidus* | 0.00 | 0.25 | 0.70 |
| *Fusarium scirpi* | 0.26 | 0.37 | 1.43 | *Fusarium acuminatum* | 0.00 | 0.25 | 0.68 |
| *Acremonium kiliense* | 0.08 | 0.48 | 1.36 | *Alternaria alternata* | 0.12 | 0.17 | 0.66 |
| *Trichoderma polysporum* | 0.41 | 0.12 | 1.32 | *Cylindrocarpon magnusianum* | 0.27 | 0.00 | 0.65 |
| *Fusarium sambucinum* | 0.50 | 0.00 | 1.31 | *Penicillium purpurascens* | 0.00 | 0.20 | 0.62 |
| *Cylindrocarpon dydimun* | 0.50 | 0.08 | 1.30 | *Trichoderma piluliferum* | 0.08 | 0.17 | 0.61 |
| *Cladosporium herbarum* | 0.00 | 0.51 | 1.30 | *Fusarium graminearum* | 0.25 | 0.00 | 0.61 |
| *Cladosporium cladosporioides* | 0.30 | 0.25 | 1.23 | *Aspergillus parasiticus* | 0.00 | 0.25 | 0.61 |
| *Penicillium restrictum* | 0.43 | 0.00 | 1.16 | *Fusarium merismoides* | 0.20 | 0.00 | 0.58 |
| *Trichoderma piluliferum* | 0.29 | 0.17 | 1.08 | **Av. Diss. = 72.57%** | **August\_2010** | **December\_2010** |  |
| *Mortierella vinacea* | 0.39 | 0.00 | 1.04 | *Fusarium oxysporum* | 2.00 | 1.53 | 5.17 |
| *Penicillium lilacinium* | 0.25 | 0.2 | 0.96 | *Rhizopus stolonifer* | 1.77 | 0.78 | 4.70 |
| *Gilmaniella humicola* | 0.37 | 0.00 | 0.91 | Oomycota | 1.89 | 0.83 | 3.84 |
| *Fusarium proliferatum* | 0.17 | 0.25 | 0.90 | *Fusarium hostae* | 0.08 | 1.22 | 3.45 |
| *Aspergillus candidus* | 0.17 | 0.25 | 0.88 | *Fusarium scirpi* | 1.00 | 0.37 | 3.38 |
| *Alternaria tenusissima* | 0.35 | 0.00 | 0.85 | *Micelia sterilia* | 1.39 | 1.78 | 3.16 |
| *Trichocladium opacum* | 0.28 | 0.00 | 0.75 | *Humicola griseae* | 1.11 | 0.82 | 3.10 |
| *Penicillium rubrum* | 0.28 | 0.00 | 0.74 | *Calicium* Pers. *.* | 1.09 | 0.88 | 3.08 |
| *Idriella lunata* | 0.23 | 0.08 | 0.72 | *Fusarium solani* | 0.27 | 1.03 | 3.00 |
| *Fusarium chlamydosporum* | 0.00 | 0.25 | 0.68 | *Penicillium thomii* | 0.00 | 0.99 | 2.71 |
| *Acremonium fuscolum* | 0.25 | 0.00 | 0.68 | *Penicillium funiculosum* | 0.25 | 0.90 | 2.43 |
| *Penicillium expansum* | 0.25 | 0.00 | 0.66 | Levadura | 0.6 | 0.77 | 2.42 |
| *Fusarium acuminatum* | 0.00 | 0.25 | 0.64 | *Epicoccum nigrum* | 0.28 | 0.87 | 2.30 |
| *Penicillium purpurascens* | 0.00 | 0.20 | 0.58 | *Eupenicillium javanicum* | 0.33 | 0.68 | 1.96 |
| *Nectria inventa* | 0.08 | 0.17 | 0.57 | *Aspergillus fumigatus* | 0.82 | 1.28 | 1.93 |
| *Aspergillus parasiticus* | 0.00 | 0.25 | 0.57 | *Stachybotrys chartarum* | 0.00 | 0.63 | 1.85 |
| *Gliocladium roseum* | 0.23 | 0.00 | 0.55 | *Trichoderma hamatum* | 0.59 | 0.08 | 1.78 |
| *Trichoderma pseudokoningii* | 0.19 | 0.00 | 0.51 | *Aspergillus niger* | 0.25 | 0.60 | 1.77 |
| *Nigrospora sphaerica* | 0.12 | 0.08 | 0.51 | *Acremonium kiliense* | 0.28 | 0.48 | 1.77 |
| *Fusarium subglutinans* | 0.20 | 0.00 | 0.51 | *Fusarium acuminatum* | 0.32 | 0.25 | 1.61 |
| *Fusarium graminearum* | 0.20 | 0.00 | 0.5 | *Humicola fuscoastra* | 0.38 | 0.33 | 1.57 |
| **Av. Diss. = 81.28%** | **April\_2010** | **December\_2010** |  | *Trichoderma polysporum* | 0.43 | 0.12 | 1.51 |
| Oomycota | 2.27 | 0.83 | 4.36 | *Cladosporium herbarum* | 0.00 | 0.51 | 1.47 |
| *Fusarium oxysporum* | 0.93 | 1.53 | 3.98 | *Penicillium citrinum* | 0.46 | 0.00 | 1.38 |
| *Trichoderma hamatum* | 1.34 | 0.08 | 3.54 | *Fusarium crookwelense* | 0.43 | 0.08 | 1.32 |
| *Rhizopus stolonifer* | 0.97 | 0.78 | 3.46 | *Fusarium chlamydosporum* | 0.24 | 0.25 | 1.32 |
| *Fusarium hostae* | 0.00 | 1.22 | 3.36 | *Trichoderma piluliferum* | 0.27 | 0.17 | 1.14 |
| *Micelia sterilia* | 1.02 | 1.78 | 3.36 | *Mortierella vinacea* | 0.39 | 0.00 | 1.11 |
| *Botryothichum piluliferum* | 1.16 | 0.00 | 3.21 | *Absidia glauca* | 0.37 | 0.00 | 1.11 |
| *Fusarium solani* | 0.8 | 1.03 | 2.96 | *Penicillium lilacinium* | 0.24 | 0.20 | 1.10 |
| *Penicillium thomii* | 0.00 | 0.99 | 2.53 | *Fusarium sporotrichiodes* | 0.34 | 0.00 | 0.99 |
| *Calicium* Pers. | 0.08 | 0.88 | 2.44 | *Trichoderma harzianum* | 0.33 | 0.00 | 0.98 |
| *Aspergillus fumigatus* | 0.42 | 1.28 | 2.44 | *Alternaria alternata* | 0.20 | 0.17 | 0.97 |
| *Penicillium funiculosum* | 0.08 | 0.90 | 2.32 | *Aspergillus parasiticus* | 0.17 | 0.25 | 0.92 |
| *Epicoccum nigrum* | 0.00 | 0.87 | 2.31 | *Trichoderma aureoviridae* | 0.23 | 0.08 | 0.89 |
| Levadura | 0.08 | 0.77 | 2.11 | *Cladosporium cladosporioides* | 0.08 | 0.25 | 0.85 |
| *Humicola griseae* | 0.60 | 0.82 | 1.97 | *Fusarium proliferatum* | 0.00 | 0.25 | 0.79 |
| *Penicillium citrinum* | 0.74 | 0.00 | 1.91 | *Aspergillus candidus* | 0.00 | 0.25 | 0.74 |
| *Trichoderma koningii* | 0.68 | 0.00 | 1.88 | *Staphylotrichum coccosporum* | 0.08 | 0.20 | 0.72 |
| *Eupenicillium javanicum* | 0.00 | 0.68 | 1.85 | *Penicillium purpurascens* | 0.00 | 0.20 | 0.66 |
| *Aspergillus niger* | 0.25 | 0.60 | 1.82 | *Trichoderma koningii* | 0.23 | 0.00 | 0.66 |
| *Stachybotrys chartarum* | 0.00 | 0.63 | 1.75 | *Fusarium merismoides* | 0.24 | 0.00 | 0.65 |
| *Acremonium kiliense* | 0.28 | 0.48 | 1.66 | *Cylindrocarpon dydimun* | 0.14 | 0.08 | 0.62 |
| *Cladosporium herbarum* | 0.17 | 0.51 | 1.47 | *Acremonium furcatum* | 0.20 | 0.00 | 0.59 |
| *Absidia glauca* | 0.51 | 0.00 | 1.40 | *Penicillium brevicompactum* | 0.19 | - | 0.52 |
| *Nectria ventricosa* | 0.52 | 0.00 | 1.32 |  |  |  |  |