**Table S1**

Comparison and analysis of the characteristics of phyllosphere and rhizosphere microbial community association network of different samples. PPKa: The phyllosphere of health *Pinus koraiensis*; PPKb: The phyllosphere of *Pinus koraiensis* naturally infected by *Bursaphelenchus xylophilus* at the early stage; PPKc: The phyllosphere of *Pinus koraiensis* naturally infected by *Bursaphelenchus xylophilus* at the last stage; RPKa: The rhizosphere of health *Pinus koraiensis*; RPKb: The rhizosphere of *Pinus koraiensis* naturally infected by *Bursaphelenchus xylophilus* at the early stage; RPKc: The rhizosphere of *Pinus koraiensis* naturally infected by *Bursaphelenchus xylophilus* at the last stage. The same below.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Network characteristics | Bacteria | | | | | | | | |
| RPKa | RPKb | RPKc | | PPKa | | PPKb | PPKc | |
| Total nodes | 1218 | 1229 | 1284 | | 492 | | 563 | 704 | |
| Edges | 48513 | 53279 | 50433 | | 9355 | | 14872 | 19302 | |
| Average degree | 79.66 | 86.703 | 78.556 | | 38.028 | | 52.831 | 54.835 | |
| Average weighted degree | 3.637 | 4.145 | 2.578 | | 25.192 | | 29.679 | 11.341 | |
| Network diameter | 5 | 5 | 5 | | 6 | | 7 | 6 | |
| Graph density | 0.065 | 0.071 | 0.061 | | 0.077 | | 0.094 | 0.078 | |
| Modularity | 21.089 | 17.977 | 56.682 | | 0.855 | | 1.124 | 2.587 | |
| Network clustering coefficient | 0.575 | 0.59 | 0.57 | | 0.639 | | 0.676 | 0.61 | |
| Average path length | 3.107 | 3.092 | 3.151 | | 3.15 | | 3.058 | 3.137 | |
| Positive correlation | 52.17% | 52.12% | 51.54% | | 79.95% | | 73.3% | 59.23% | |
| Negative correlation | 47.83% | 47.88% | 48.46% | | 20.05% | | 26.7% | 40.77% | |
| Network characteristics | Fungi | | | | | | | | | |
| RPKa | RPKb | RPKc | PPKa | | PPKb | | | PPKc | |
| Total nodes | 418 | 443 | 439 | 752 | | 1036 | | | 1011 | |
| Edges | 5585 | 6415 | 5954 | 18162 | | 38358 | | | 33559 | |
| Average degree | 26.722 | 28.962 | 27.125 | 48.303 | | 74.05 | | | 66.388 | |
| Average weighted degree | 29.717 | 27.031 | 18.667 | 65.229 | | 115.34 | | | 96.395 | |
| Network diameter | 7 | 6 | 6 | 6 | | 6 | | | 5 | |
| Graph density | 0.064 | 0.066 | 0.062 | 0.064 | | 0.072 | | | 0.066 | |
| Modularity | 0.907 | 1.05 | 1.31 | 0.899 | | 0.864 | | | 0.885 | |
| Network clustering coefficient | 0.764 | 0.753 | 0.731 | 0.783 | | 0.82 | | | 0.796 | |
| Average path length | 3.096 | 3.14 | 3.131 | 2.897 | | 2.735 | | | 2.823 | |
| Positive correlation | 83.04% | 79.08% | 70.73% | 85.84% | | 89.93% | | | 87.74% | |
| Negative correlation | 16.96% | 20.92% | 29.27% | 14.16% | | 10.07% | | | 12.26% | |