

Supplementary Information for « Revealing hidden insect-fungus interactions; moderately specialized, modular and anti-nested detritivore networks» by Rannveig M. Jacobsen, Anne

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Table S8) Number of individual wood-inhabiting beetles with fungal DNA sampled from Losby or Løvenskiold-Vækerø (LV) study landscape, and number sampled in the first (2014) and second (2015) year after the logs had been cut and placed in the study landscapes.

| <b>Insect species</b>                           | <b>Losby</b> | <b>LV</b> | <b>2014</b> | <b>2015</b> | <b>Sum ind.</b> |
|---|--------------|-----------|-------------|-------------|-----------------|
| <i>Acrulia inflata</i>                          | 2            | 4         | 0           | 6           | 6               |
| <i>Agathidium nigripenne</i>                    | 6            | 5         | 0           | 11          | 11              |
| <i>Agathidium</i> sp.                           | 1            | 4         | 0           | 5           | 5               |
| <i>Anisotoma humeralis</i>                      | 1            | 0         | 0           | 1           | 1               |
| <i>Anthobium</i> sp.                            | 5            | 0         | 0           | 5           | 5               |
| <i>Anthophagus</i> sp.                          | 3            | 6         | 3           | 6           | 9               |
| <i>Cis boleti</i>                               | 0            | 1         | 1           | 0           | 1               |
| <i>Endomychus coccineus</i>                     | 4            | 12        | 0           | 16          | 16              |
| <i>Eपुरaea</i> sp.                              | 6            | 0         | 6           | 0           | 6               |
| <i>Glischrochilus hortensis</i>                 | 24           | 24        | 0           | 48          | 48              |
| <i>Glischrochilus</i><br><i>quadripunctatus</i> | 22           | 9         | 0           | 31          | 31              |
| <i>Oxypoda alternans</i>                        | 7            | 1         | 1           | 7           | 8               |
| <i>Quedius</i> sp.                              | 3            | 4         | 4           | 3           | 7               |
| <i>Rhizophagus</i> sp.                          | 9            | 14        | 0           | 23          | 23              |
| <i>Sepedophilus littoreus</i>                   | 0            | 3         | 1           | 2           | 3               |

|                  |    |    |    |     |     |
|------------------|----|----|----|-----|-----|
| Trypodendron     | 1  | 0  | 0  | 1   | 1   |
| domesticum       |    |    |    |     |     |
| Xylita laevigata | 4  | 2  | 3  | 3   | 6   |
| Total            | 98 | 89 | 19 | 168 | 187 |

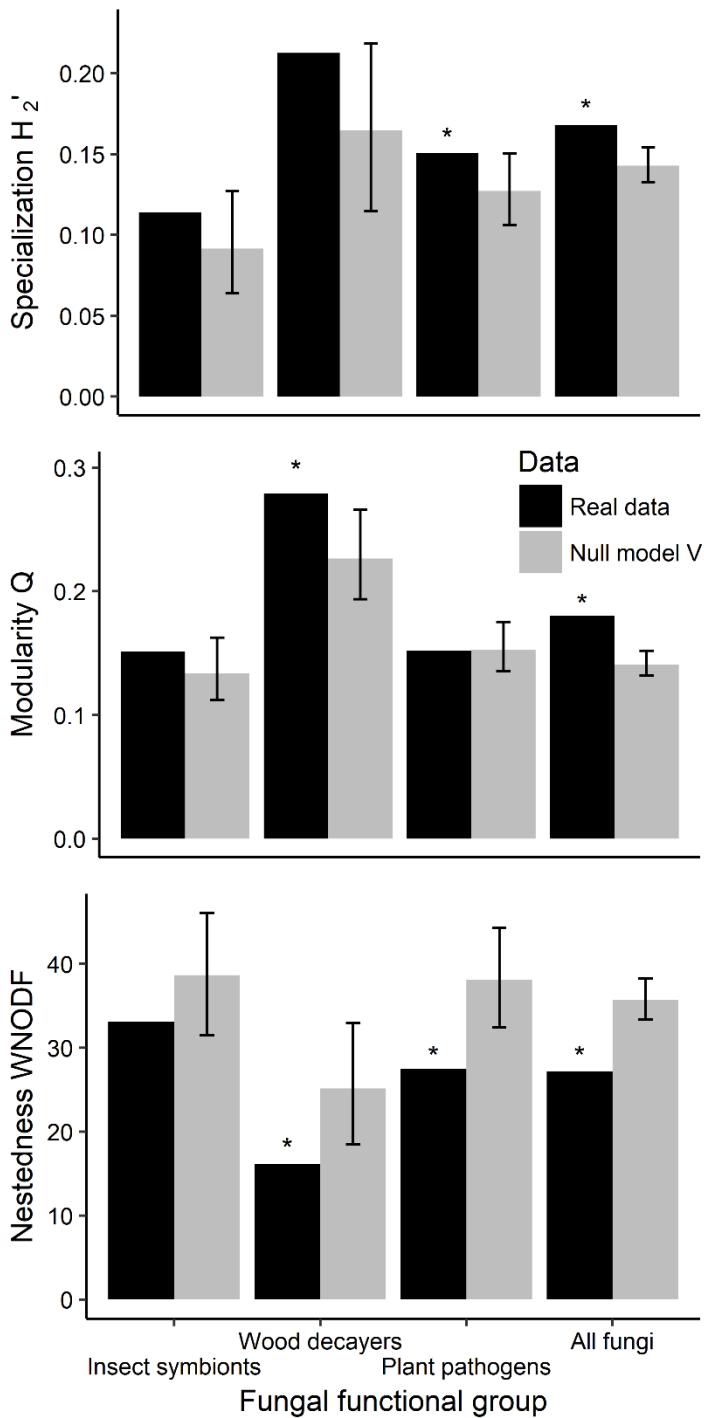


Fig. S1) Network specialization ( $H_2'$ ), modularity (Q) and weighted nestedness (WNODF) for networks between wood-inhabiting beetles and the fungal functional groups insect symbionts, wood-decayers and plant pathogens, or all fungi annotated to species or genus. Black bars represent the original networks, while grey bars represent networks randomized with constant marginal sums and constant connectance according to null model V with 95%

confidence intervals (CI). The weighted connectance was 0.148 for the insect symbiont network, 0.14 for the wood-inhabiting agaricomycetes and 0.155 for the plant pathogen network. Asterisks (\*) above the black bars signify significant ( $P$ -value  $< 0.05$ ) differences between the original and the randomized networks.

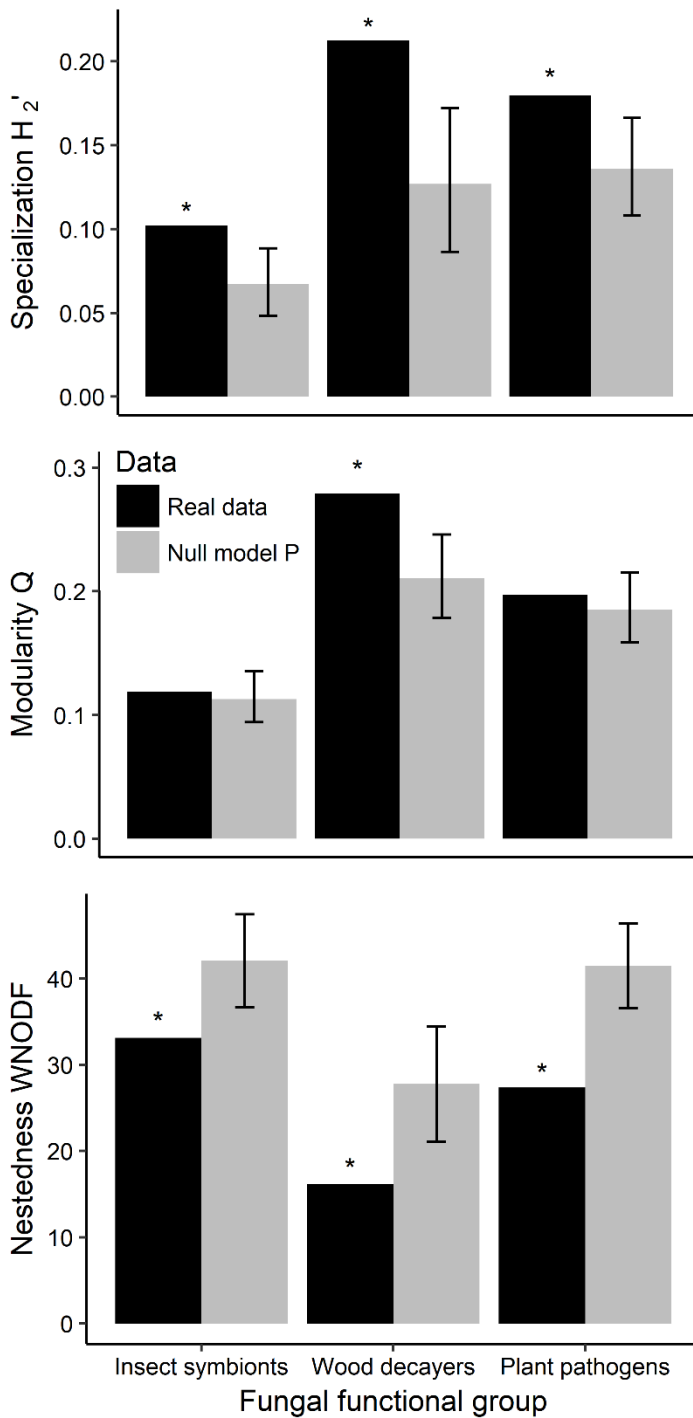


Fig. S2) Network specialization ( $H_2'$ ), modularity (Q) and weighted nestedness (WNODF) for networks between wood-inhabiting beetles and the fungal functional groups insect symbionts, wood-decayers and plant pathogens. The networks have been subsampled to a standardised number of species matching the smallest network, i.e. 17 insect species and 22 fungal OTUs. Black bars represent the original networks, while grey bars represent networks

randomized with constant marginal sums according to null model P with 95% confidence intervals (CI). Asterisks (\*) above the black bars signify significant (P-value < 0.05) differences between the original and the randomized networks.

Table S9) Species-level specialization indices ( $d'$ ) for the wood-inhabiting beetle species in the network with insect symbiont fungi. Mean, lower and upper tails with p-values from two-sided tests are based on null model P with fixed marginal sums. Significant ( $<0.05$ ) or near significant (0.10) p-values in bold.

| Insect species  | $d'$ | Mean<br>simulated $d'$ | Lower tail<br>(2.5%) | Upper tail<br>(97.5%) | P-value      |
|---|------|------------------------|----------------------|-----------------------|--------------|
| <i>Acrulia inflata</i>  | 0.21 | 0.16                   | 0.01                 | 0.37                  | 0.536        |
| <i>Agathidium nigripenne</i>                                  | 0.10 | 0.11                   | 0.05                 | 0.20                  | 0.912        |
| <i>Agathidium</i> sp.   | 0.23 | 0.15                   | 0.02                 | 0.34                  | 0.313        |
| <i>Anisotoma humeralis</i>                                    | 0.04 | 0.22                   | 0.00                 | 0.78                  | 1.000        |
| <i>Anthobium</i> sp.  | 0.10 | 0.12                   | 0.05                 | 0.22                  | 0.702        |
| <i>Anthophagus</i> sp.  | 0.18 | 0.12                   | 0.05                 | 0.21                  | 0.171        |
| <i>Cis boleti</i>   | 0.72 | 0.23                   | 0.00                 | 0.78                  | 0.153        |
| <i>Endomychus coccineus</i>                                   | 0.12 | 0.08                   | 0.03                 | 0.13                  | 0.147        |
| <b><i>Epuraea</i> sp.</b>                                     | 0.28 | 0.11                   | 0.05                 | 0.19                  | <b>0.001</b> |
| <i>Glischrochilus hortensis</i>                               | 0.07 | 0.05                   | 0.03                 | 0.08                  | 0.243        |
| <b><i>Glischrochilus</i></b><br><b><i>quadripunctatus</i></b> | 0.09 | 0.06                   | 0.04                 | 0.09                  | <b>0.067</b> |
| <i>Oxyroda alternans</i>                                      | 0.25 | 0.14                   | 0.03                 | 0.31                  | 0.163        |
| <i>Quedius</i> sp.  | 0.14 | 0.13                   | 0.04                 | 0.24                  | 0.672        |
| <i>Rhizophagus</i> sp.  | 0.11 | 0.07                   | 0.03                 | 0.12                  | 0.101        |
| <i>Sepedophilus littoreus</i>                                 | 0.07 | 0.14                   | 0.03                 | 0.29                  | 0.323        |
| <b><i>Trypodendron domesticum</i></b>                         | 0.39 | 0.17                   | 0.01                 | 0.40                  | <b>0.061</b> |
| <i>Xylita laevigata</i>                                       | 0.19 | 0.14                   | 0.03                 | 0.31                  | 0.449        |

Table S10) Species-level specialization indices ( $d'$ ) for the insect symbiont fungus species in the network with wood-inhabiting beetles. Mean, lower and upper tails with p-values from two-sided tests are based on null model P with fixed marginal sums. Significant (<0.05) or near significant (0.10) p-values in bold.

| Fungus species                          | $d'$ | Mean<br>simulated $d'$ | Lower tail<br>(2.5%) | Upper tail<br>(97.5%) | P-value      |
|---|------|------------------------|----------------------|-----------------------|--------------|
| <i>Candida</i> sp.                      | 0.03 | 0.03                   | 0.01                 | 0.05                  | 0.694        |
| <i>Candida fructus</i>                  | 0.06 | 0.13                   | 0.00                 | 0.35                  | 0.562        |
| <i>Teunomyces kruisii</i>               | 0.23 | 0.12                   | 0.00                 | 0.33                  | 0.259        |
| <b><i>Candida mesenterica</i></b>       | 0.07 | 0.03                   | 0.01                 | 0.06                  | <b>0.009</b> |
| <b><i>Candida sake</i></b>              | 0.66 | 0.17                   | 0.00                 | 0.59                  | <b>0.031</b> |
| <i>Candida schatavii</i>                | 0.00 | 0.18                   | 0.00                 | 0.49                  | 0.411        |
| <b><i>Suhomyces tanzawaensis</i></b>    | 0.58 | 0.15                   | 0.00                 | 0.40                  | <b>0.005</b> |
| <i>Candida trypodendroni</i>            | 0.15 | 0.11                   | 0.00                 | 0.30                  | 0.594        |
| <i>Carcinomyces polyporina</i>          | 0.08 | 0.11                   | 0.00                 | 0.31                  | 0.824        |
| <i>Cryptococcus</i> sp.                 | 0.02 | 0.03                   | 0.01                 | 0.06                  | 0.463        |
| <i>Naganishia adeliensis</i>            | 0.10 | 0.08                   | 0.02                 | 0.18                  | 0.443        |
| <i>Cryptococcus</i><br>aff.amylolyticus | 0.13 | 0.11                   | 0.00                 | 0.30                  | 0.702        |
| <i>Piskurozyma cylindrica</i>           | 0.07 | 0.07                   | 0.02                 | 0.15                  | 0.978        |
| <i>Vishniacozyma foliicola</i>          | 0.14 | 0.18                   | 0.00                 | 0.52                  | 0.936        |
| <i>Cryptococcus huempii</i>             | 0.09 | 0.07                   | 0.02                 | 0.13                  | 0.518        |
| <b><i>Cryptococcus stepposus</i></b>    | 0.63 | 0.16                   | 0.00                 | 0.63                  | <b>0.069</b> |
| <i>Solicoccozyma terricola</i>          | 0.05 | 0.13                   | 0.00                 | 0.34                  | 0.479        |



|                                       |      |      |      |      |              |
|---------------------------------------|------|------|------|------|--------------|
| <i>Vishniacozyma victoriae</i>        | 0.10 | 0.06 | 0.02 | 0.11 | 0.105        |
| <i>Filobasidium wieringae</i>         | 0.09 | 0.12 | 0.00 | 0.30 | 0.896        |
| <i>Debaryomyces hansenii</i>          | 0.07 | 0.07 | 0.02 | 0.17 | 0.954        |
| <b><i>Cryptococcus neoformans</i></b> | 0.62 | 0.13 | 0.00 | 0.34 | <b>0.001</b> |
| <b>var. uniguttulatus</b>             |      |      |      |      |              |
| <i>Fusarium solani</i>                | 0.14 | 0.18 | 0.00 | 0.52 | 0.922        |
| <i>Leucosporidium</i>                 | 0.08 | 0.07 | 0.02 | 0.13 | 0.526        |
| <b><i>Ophiostoma canum</i></b>        | 0.12 | 0.06 | 0.02 | 0.12 | <b>0.041</b> |
| <i>Ophiostoma karelicum</i>           | 0.14 | 0.12 | 0.00 | 0.28 | 0.682        |
| <i>Ophiostoma piceae</i>              | 0.21 | 0.11 | 0.01 | 0.26 | 0.175        |
| <i>Ophiostoma quercus</i>             | 0.40 | 0.17 | 0.00 | 0.63 | 0.467        |
| <i>Ophiostoma tetropii</i>            | 0.21 | 0.11 | 0.00 | 0.29 | 0.199        |
| <i>Phialophoropsis ferruginea</i>     | 0.18 | 0.09 | 0.02 | 0.22 | 0.157        |
| <i>Taphrina</i> sp.                   | 0.05 | 0.07 | 0.02 | 0.13 | 0.560        |
| <i>Tremella globispora</i>            | 0.22 | 0.12 | 0.00 | 0.33 | 0.283        |
| <i>Tremella</i> sp.                   | 0.18 | 0.12 | 0.00 | 0.34 | 0.477        |
| <i>Naematelia aurantialba</i>         | 0.17 | 0.14 | 0.00 | 0.39 | 0.732        |
| <i>Phaeotremella pseudofoliacea</i>   | 0.23 | 0.11 | 0.00 | 0.29 | 0.155        |
| <i>Trichosporon</i>                   | 0.08 | 0.15 | 0.00 | 0.40 | 0.644        |

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Table S11) Species-level specialization indices ( $d'$ ) for the wood-inhabiting beetle species in the network with wood-decay agaricomycete fungi. Mean, lower and upper tails with p-values from two-sided tests are based on null model P with fixed marginal sums. Significant (<0.05) or near significant (0.10) p-values in bold.

| Insect species                         | $d'$ | Mean simulated $d'$ | Lower tail (2.5%) | Upper tail (97.5%) | P-value      |
|--|------|---------------------|-------------------|--------------------|--------------|
| <i>Acrulia inflata</i>                 | 0.28 | 0.19                | 0.00              | 0.61               | 0.552        |
| <i>Agathidium nigripenne</i>           | 0.13 | 0.14                | 0.03              | 0.27               | 0.906        |
| <i>Agathidium</i> sp.                  | 0.07 | 0.17                | 0.03              | 0.42               | 0.353        |
| <i>Anisotoma humeralis</i>             | 0.24 | 0.24                | 0.00              | 0.76               | 0.816        |
| <i>Anthobium</i> sp.                   | 0.16 | 0.19                | 0.02              | 0.51               | 1.000        |
| <i>Anthophagus</i> sp.                 | 0.29 | 0.19                | 0.04              | 0.46               | 0.331        |
| <i>Cis boleti</i>                      | 0.63 | 0.33                | 0.00              | 1.00               | 0.439        |
| <b><i>Endomychus coccineus</i></b>     | 0.25 | 0.12                | 0.05              | 0.19               | <b>0.005</b> |
| <i>Epuraea</i> sp.                     | 0.36 | 0.20                | 0.00              | 0.62               | 0.353        |
| <b><i>Glischrochilus hortensis</i></b> | 0.18 | 0.11                | 0.06              | 0.18               | <b>0.053</b> |
| <i>Glischrochilus quadripunctatus</i>  | 0.17 | 0.12                | 0.06              | 0.21               | 0.247        |
| <i>Oxypoda alternans</i>               | 0.63 | 0.32                | 0.00              | 1.00               | 0.413        |
| <i>Quedius</i> sp.                     | 0.31 | 0.19                | 0.02              | 0.54               | 0.369        |
| <i>Rhizophagus</i> sp.                 | 0.20 | 0.13                | 0.04              | 0.25               | 0.225        |
| <i>Sepedophilus littoreus</i>          | 0.14 | 0.15                | 0.02              | 0.37               | 0.986        |
| <i>Xylita laevigata</i>                | 0.22 | 0.15                | 0.02              | 0.35               | 0.361        |

Table S12) Species-level specialization indices ( $d'$ ) for the wood-decay agaricomycete fungus species in the network with wood-inhabiting beetles. Mean, lower and upper tails with p-values from two-sided tests are based on null model P with fixed marginal sums.

Significant (<0.05) or near significant (0.10) p-values in bold.

| Fungus species                  | $d'$ | Mean simulated $d'$ | Lower tail (2.5%) | Upper tail (97.5%) | P-value      |
|---------------------------------|------|---------------------|-------------------|--------------------|--------------|
| <i>Amylocystis lapponica</i>    | 0.17 | 0.14                | 0.02              | 0.34               | 0.714        |
| <i>Antrodiella parasitica</i>   | 0.71 | 0.21                | 0.00              | 0.71               | 0.109        |
| <i>Chondrostereum purpureum</i> | 0.09 | 0.06                | 0.02              | 0.12               | 0.259        |
| <i>Corticium roseum</i>         | 0.44 | 0.19                | 0.00              | 0.71               | 0.437        |
| <i>Fibulorhizoctonia</i> sp.    | 0.25 | 0.17                | 0.01              | 0.40               | 0.433        |
| <b><i>Fomes fomentarius</i></b> | 0.38 | 0.12                | 0.04              | 0.22               | <b>0.001</b> |
| <i>Fomitopsis pinicola</i>      | 0.15 | 0.15                | 0.02              | 0.35               | 0.942        |
| <i>Heterobasidion</i> sp.       | 0.12 | 0.16                | 0.01              | 0.39               | 0.744        |
| <i>Kneiffiella abieticola</i>   | 0.03 | 0.20                | 0.00              | 0.81               | 0.900        |
| <i>Kuehneromyces lignicola</i>  | 0.31 | 0.23                | 0.00              | 0.52               | 0.576        |
| <i>Mycena rubromarginata</i>    | 0.11 | 0.23                | 0.00              | 0.51               | 0.347        |
| <i>Peniophora</i> sp.           | 0.21 | 0.17                | 0.01              | 0.39               | 0.570        |
| <i>Phlebia centrifuga</i>       | 0.07 | 0.14                | 0.03              | 0.31               | 0.409        |
| <i>Pseudochaete intricata</i>   | 0.03 | 0.20                | 0.00              | 0.71               | 0.854        |
| <i>Resinicium bicolor</i>       | 0.18 | 0.23                | 0.00              | 0.52               | 0.890        |
| <i>Schizophyllum commune</i>    | 0.04 | 0.20                | 0.00              | 0.71               | 1.000        |
| <i>Scopuloides rimosa</i>       | 0.63 | 0.19                | 0.00              | 0.81               | 0.203        |

|                               |      |      |      |      |              |
|-------------------------------|------|------|------|------|--------------|
| <b>Sistotrema brinkmannii</b> | 0.24 | 0.12 | 0.04 | 0.22 | <b>0.033</b> |
| Stereum sp.                   | 0.31 | 0.19 | 0.00 | 0.71 | 0.690        |
| <b>Trametes versicolor</b>    | 0.45 | 0.17 | 0.01 | 0.42 | <b>0.029</b> |
| Trechispora sp.               | 0.35 | 0.17 | 0.01 | 0.42 | 0.115        |
| Trichaptum abietinum          | 0.06 | 0.15 | 0.02 | 0.36 | 0.395        |

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Table S13) Species-level specialization indices ( $d'$ ) for the wood-inhabiting beetle species in the network with plant-pathogenic fungi. Mean, lower and upper tails with p-values from two-sided tests are based on null model P with fixed marginal sums. Significant ( $<0.05$ ) or near significant (0.10) p-values in bold.

| Insect species                            | $d'$ | Mean<br>simulated $d'$ | Lower tail<br>(2.5%) | Upper tail<br>(97.5%) | P-value      |
|---|------|------------------------|----------------------|-----------------------|--------------|
| <b>Acrulia inflata</b>                    | 0.29 | 0.15                   | 0.07                 | 0.25                  | <b>0.007</b> |
| Agathidium nigripenne                     | 0.18 | 0.15                   | 0.08                 | 0.23                  | 0.347        |
| Agathidium sp.                            | 0.18 | 0.18                   | 0.06                 | 0.33                  | 0.882        |
| Anisotoma humeralis                       | 0.29 | 0.22                   | 0.04                 | 0.46                  | 0.463        |
| Anthobium sp.                             | 0.17 | 0.14                   | 0.08                 | 0.22                  | 0.489        |
| Anthophagus sp.                           | 0.19 | 0.13                   | 0.08                 | 0.20                  | 0.135        |
| <b>Endomychus coccineus</b>               | 0.16 | 0.08                   | 0.05                 | 0.12                  | <b>0.001</b> |
| Epuraea sp.                               | 0.26 | 0.16                   | 0.06                 | 0.29                  | 0.129        |
| Glischrochilus hortensis                  | 0.06 | 0.06                   | 0.04                 | 0.08                  | 0.393        |
| <b>Glischrochilus<br/>quadripunctatus</b> | 0.11 | 0.07                   | 0.05                 | 0.10                  | <b>0.017</b> |
| Oxyroda alternans                         | 0.24 | 0.17                   | 0.06                 | 0.30                  | 0.259        |
| <b>Quedius sp.</b>                        | 0.19 | 0.14                   | 0.07                 | 0.21                  | <b>0.097</b> |
| Rhizophagus sp.                           | 0.08 | 0.10                   | 0.06                 | 0.15                  | 0.401        |
| Sepedophilus littoreus                    | 0.25 | 0.19                   | 0.06                 | 0.37                  | 0.411        |
| Trypodendron domesticum                   | 0.42 | 0.29                   | 0.00                 | 0.78                  | 0.602        |
| <b>Xylita laevigata</b>                   | 0.31 | 0.14                   | 0.08                 | 0.22                  | <b>0.001</b> |

Table S14) Species-level specialization indices ( $d'$ ) for the plant-pathogenic fungus species in the network with wood-inhabiting beetles. Mean, lower and upper tails with p-values from two-sided tests are based on null model P with fixed marginal sums. Significant ( $<0.05$ ) or near significant (0.10) p-values in bold.

| Fungus species                                   | $d'$ | Mean<br>simulated $d'$ | Lower tail<br>(2.5%) | Upper tail<br>(97.5%) | P-value      |
|--|------|------------------------|----------------------|-----------------------|--------------|
| <i>Alternaria alternata</i>                      | 0.23 | 0.15                   | 0.00                 | 0.37                  | 0.319        |
| <i>Alternaria infectoria</i>                     | 0.18 | 0.12                   | 0.00                 | 0.31                  | 0.427        |
| <i>Botryotinia fuckeliana</i>                    | 0.08 | 0.07                   | 0.02                 | 0.16                  | 0.694        |
| <b><i>Ceratocystis paradoxa</i></b>              | 0.42 | 0.16                   | 0.00                 | 0.42                  | <b>0.059</b> |
| <i>Sphaeria chrysosperma</i>                     | 0.33 | 0.16                   | 0.00                 | 0.46                  | 0.187        |
| <b><i>Dactylaria dimorphospora</i></b>           | 0.13 | 0.06                   | 0.03                 | 0.12                  | <b>0.015</b> |
| <i>Devriesia</i> sp.                             | 0.39 | 0.18                   | 0.00                 | 0.59                  | 0.387        |
| <i>Exobasidium</i> sp.                           | 0.07 | 0.05                   | 0.02                 | 0.10                  | 0.439        |
| <b><i>Exobasidium arescens</i></b>               | 0.13 | 0.07                   | 0.03                 | 0.15                  | <b>0.089</b> |
| <i>Exobasidium bisporum</i>                      | 0.07 | 0.06                   | 0.02                 | 0.12                  | 0.708        |
| <i>Exobasidium maculosum</i>                     | 0.39 | 0.16                   | 0.00                 | 0.59                  | 0.347        |
| <i>Fusarium ciliatum</i>                         | 0.11 | 0.14                   | 0.00                 | 0.38                  | 0.860        |
| <b><i>Fusicolla merismoides</i></b>              | 0.04 | 0.03                   | 0.01                 | 0.05                  | <b>0.059</b> |
| <b><i>Fusarium tricinctum</i></b>                | 0.02 | 0.10                   | 0.01                 | 0.23                  | <b>0.073</b> |
| <i>Grosmannia cucullata</i>                      | 0.10 | 0.12                   | 0.00                 | 0.31                  | 0.930        |
| <i>Grosmannia francke-</i><br><i>grosmanniae</i> | 0.24 | 0.12                   | 0.00                 | 0.30                  | 0.155        |
| <i>Hortaea</i> sp.                               | 0.12 | 0.08                   | 0.02                 | 0.18                  | 0.297        |

|                                |      |      |      |      |              |
|--------------------------------|------|------|------|------|--------------|
| Hyalopeziza sp.                | 0.04 | 0.12 | 0.02 | 0.29 | 0.273        |
| Ilyonectria hubeiensis         | 0.04 | 0.08 | 0.01 | 0.17 | 0.327        |
| Leptographium sp.              | 0.37 | 0.18 | 0.00 | 0.59 | 0.467        |
| Leptographium piriforme        | 0.13 | 0.08 | 0.01 | 0.18 | 0.235        |
| Leptosphaeria sp.              | 0.06 | 0.05 | 0.02 | 0.10 | 0.720        |
| Libertella sp.                 | 0.41 | 0.17 | 0.00 | 0.59 | 0.291        |
| <b>Lirula yunnanensis</b>      | 0.16 | 0.07 | 0.02 | 0.16 | <b>0.069</b> |
| Lophodermium conigenum         | 0.46 | 0.18 | 0.00 | 0.59 | 0.177        |
| Lophodermium piceae            | 0.02 | 0.03 | 0.01 | 0.05 | 0.540        |
| Melampsora sp.                 | 0.38 | 0.16 | 0.00 | 0.46 | 0.113        |
| Mollisia sp.                   | 0.25 | 0.14 | 0.00 | 0.35 | 0.319        |
| Monilinia sp.                  | 0.37 | 0.18 | 0.00 | 0.59 | 0.473        |
| Mycocentrospora acerina        | 0.18 | 0.17 | 0.00 | 0.56 | 0.952        |
| Neonectria sp.                 | 0.07 | 0.07 | 0.02 | 0.13 | 0.932        |
| Neonectria fuckeliana          | 0.21 | 0.14 | 0.00 | 0.36 | 0.421        |
| Neonectria obtusispora         | 0.06 | 0.07 | 0.03 | 0.13 | 0.976        |
| Neonectria punicea             | 0.03 | 0.12 | 0.00 | 0.30 | 0.151        |
| Parascedosporium putredinis    | 0.42 | 0.18 | 0.00 | 0.59 | 0.211        |
| Pezicula melanigena            | 0.18 | 0.18 | 0.00 | 0.59 | 0.926        |
| Phacidium lacerum              | 0.11 | 0.07 | 0.03 | 0.14 | 0.205        |
| Phaeocryptopus gaumannii       | 0.27 | 0.14 | 0.00 | 0.36 | 0.159        |
| <b>Podosphaera sp.</b>         | 0.44 | 0.14 | 0.00 | 0.36 | <b>0.013</b> |
| <b>Podosphaera clandestina</b> | 0.34 | 0.12 | 0.00 | 0.29 | <b>0.011</b> |
| Polyscytalum sp.               | 0.08 | 0.08 | 0.01 | 0.20 | 0.808        |
| Powellomyces sp.               | 0.03 | 0.07 | 0.02 | 0.15 | 0.189        |

|                             |      |      |      |      |              |
|-----------------------------|------|------|------|------|--------------|
| Protomyces sp.              | 0.08 | 0.05 | 0.02 | 0.09 | 0.149        |
| Pseudocercospora fraxini    | 0.05 | 0.06 | 0.02 | 0.12 | 0.740        |
| Thekopsora areolata         | 0.18 | 0.10 | 0.01 | 0.25 | 0.215        |
| Ramichloridium pini         | 0.39 | 0.18 | 0.00 | 0.56 | 0.365        |
| Ramularia stellenboschensis | 0.07 | 0.07 | 0.02 | 0.15 | 0.794        |
| <b>Rhizosphaera sp.</b>     | 0.09 | 0.03 | 0.01 | 0.06 | <b>0.001</b> |
| Rhizosphaera kalkhoffii     | 0.02 | 0.05 | 0.02 | 0.08 | 0.139        |
| Scleroconidioma sp.         | 0.05 | 0.06 | 0.02 | 0.11 | 0.768        |
| <b>Mycosphaerella</b>       | 0.23 | 0.10 | 0.01 | 0.24 | <b>0.075</b> |
| <b>grossulariae</b>         |      |      |      |      |              |
| <b>Septoria sp.</b>         | 0.61 | 0.17 | 0.00 | 0.59 | <b>0.039</b> |
| Septoria tanacetii          | 0.18 | 0.17 | 0.00 | 0.59 | 0.922        |
| Sirococcus sp.              | 0.25 | 0.12 | 0.00 | 0.32 | 0.165        |
| Spizellomyces               | 0.07 | 0.07 | 0.03 | 0.14 | 0.966        |
| pseudodichotomus            |      |      |      |      |              |
| Sporendocladia bactrospora  | 0.52 | 0.20 | 0.00 | 0.59 | 0.151        |
| Stagonospora sp.            | 0.12 | 0.14 | 0.00 | 0.35 | 0.950        |
| Tryblidiopsis pinastri      | 0.06 | 0.08 | 0.01 | 0.18 | 0.674        |
| Venturia inaequalis         | 0.18 | 0.12 | 0.02 | 0.27 | 0.319        |
| Verticillium sp.            | 0.31 | 0.14 | 0.00 | 0.36 | 0.129        |
| <b>Leptobacillium</b>       | 0.20 | 0.07 | 0.03 | 0.14 | <b>0.003</b> |
| <b>leptobactrum</b>         |      |      |      |      |              |

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