**Supplementary Tables**

**Table S1.** Results of linear regression on plant fitness as a function of species evenness examined in *I*. *purpurea* grown in control treatment (*i.e.,* absence of competition). Species evenness, root architecture, their two-way interaction, and Block were included in the final modelǂ as fixed main effects. Linear regression coefficient slopes (𝛣) are reported with ± 1 standard error. P < 0.05 \*; P <0.01 \*\*; P <0.001\*\*\*; P =0.09 ^

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| --- | --- | --- | --- | --- |
| **Term** | ***b*** | **SE** | ***t*-statistic** | ***p*-value** |
| (Intercept) | 0.353 | 0.2 | 1.761 | 0.086 |
| *Sp.* evenness | -0.103 | 0.1 | -1.033 | 0.308 |
| Root architecture | -0.059 | 0.07 | -0.841 | 0.405 |
| Block | 0.189 | 0.069 | 2.747 | 0.009\*\* |
| *Sp.* Evenness × root architecture | 0.03 | 0.146 | 0.206 | 0.838 |

ǂModel: Relative fitness = *B*0(Species evenness) + *B*1(Root architecture) +*B*2(Block)

**Table S2.** Results of linear regression on plant fitness as a function of species richness examined in *I*. *purpurea* grown in control treatment (*i.e.,* absence of competition). Species richness, root architecture, their two-way interaction, and Block were included in the final modelǂ as fixed main effects. Linear regression coefficient slopes (𝛣) are reported with ± 1 standard error. P < 0.05 \*; P <0.01 \*\*; P <0.001\*\*\*; P =0.09 ^

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| --- | --- | --- | --- | --- |
| **Term** | ***b*** | **SE** | ***t*-statistic** | ***p*-value** |
| (Intercept) | 0.34 | 0.2 | 1.7 | 0.097 |
| *Sp.* richness | 0.1 | 0.096 | 1.041 | 0.304 |
| PC2 | -0.059 | 0.075 | -0.789 | 0.435 |
| Block | 0.195 | 0.069 | 2.823 | 0.008\*\* |
| *Sp.* richness × root architecture | 0.002 | 0.106 | 0.021 | 0.984 |

ǂModel: Relative fitness = *B*0(Species richness) + *B*1(Root architecture) +*B*2(Block)

**Table S3.** Results of linear regression on plant fitness as a function of Inverse Simpson Diversiy examined in *I*. *purpurea* grown in control treatment (*i.e.,* absence of competition). Inverse Simpson Diversiy, root architecture, their two-way interaction, and Block were included in the final modelǂ as fixed main effects. Linear regression coefficient slopes (𝛣) are reported with ± 1 standard error. P < 0.05 \*; P <0.01 \*\*; P <0.001\*\*\*; P =0.09 ^

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| --- | --- | --- | --- | --- |
| **Term** | ***b*** | **SE** | ***t*-statistic** | ***p*-value** |
| (Intercept) | 0.367 | 0.201 | 1.827 | 0.076 |
| Inverse Simpson Diversity | 0.061 | 0.141 | 0.433 | 0.668 |
| Root architecture | -0.033 | 0.084 | -0.396 | 0.694 |
| Block | 0.196 | 0.07 | 2.784 | 0.008\*\* |
| Inverse Simpson Diversity × Root architecture | 0.039 | 0.11 | 0.359 | 0.722 |

ǂModel: Relative fitness = *B*0(Inverse Simpson Diversity) + *B*1(Root architecture) +*B*2(Block)

**Table S4.** Results of linear regression on plant fitness as a function of Simpson Diversiy examined in *I*. *purpurea* grown in control treatment (*i.e.,* absence of competition). Simpson Diversiy, root architecture, their two-way interaction, and Block were included in the final modelǂ as fixed main effects. Linear regression coefficient slopes (𝛣) are reported with ± 1 standard error. P < 0.05 \*; P <0.01 \*\*; P <0.001\*\*\*; P =0.09 ^

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| --- | --- | --- | --- | --- |
| **Term** | ***b*** | **SE** | ***t*-statistic** | ***p*-value** |
| (Intercept) | 0.36 | 0.202 | 1.786 | 0.082 |
| Simpson Diversity | 0.04 | 0.127 | 0.314 | 0.755 |
| Root architecture | -0.035 | 0.077 | -0.46 | 0.648 |
| Block | 0.196 | 0.07 | 2.791 | 0.008\*\* |
| Simpson Diversity × Root architecture | 0.038 | 0.093 | 0.413 | 0.682 |

ǂModel: Relative fitness = *B*0(Simpson Diversity) + *B*1(Root architecture) +*B*2(Block)

**Table S5.** Results of ANCOVA performed on plant fitness evaluating for species richness by treatment interaction term while adjusting for block and root architecture.

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| --- | --- | --- | --- | --- |
| **Term** | **SS** | **MS** | ***F*-value** | ***p-*value** |
| *Sp*. richness | 0.636 | 0.636 | 0.95 | 0.331 |
| Treatment | 0.442 | 0.442 | 0.661 | 0.418 |
| Block | 7.203 | 7.203 | 10.761 | 0.001\*\* |
| Root architecture | 1.401 | 1.401 | 2.093 | 0.15 |
| Sp. Richness × Treatment | 0.283 | 0.283 | 0.423 | 0.516 |
| Sp. Richness × Block | 0.969 | 0.969 | 1.448 | 0.231 |
| Sp. Richness × Root architecture | 0.238 | 0.238 | 0.355 | 0.552 |

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| --- | --- | --- | --- | --- |
| **Term** | **SS** | **MS** | ***F*-value** | ***p-*value** |
| Sp. evenness | 0.448 | 0.448 | 0.673 | 0.413 |
| Treatment | 0.454 | 0.454 | 0.682 | 0.41 |
| Block | 7.154 | 7.154 | 10.746 | 0.001\*\* |
| Root architecture | 1.451 | 1.451 | 2.179 | 0.142 |
| Sp. Evenness × Treatment | 0.536 | 0.536 | 0.805 | 0.371 |
| Sp. evenness × Block | 0.002 | 0.002 | 0.004 | 0.952 |
| Sp. evenness × Root architecture | 1.66 | 1.66 | 2.493 | 0.116 |

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| --- | --- | --- | --- | --- |
| **Term** | **SS** | **MS** | **F-value** | ***p-*value** |
| Inverse Simpson Diversity | 0.99 | 0.99 | 1.504 | 0.222 |
| Treatment | 0.277 | 0.277 | 0.421 | 0.517 |
| Block | 7.347 | 7.347 | 11.156 | 0.001\*\* |
| Root architecture | 1.338 | 1.338 | 2.032 | 0.156 |
| Inverse Simpson Diversity × Treatment | 0 | 0 | 0 | 0.988 |
| Inverse Simpson Diversity × Block | 2.603 | 2.603 | 3.953 | 0.049\* |
| Inverse Simpson Diversity × Root architecture | 0.24 | 0.24 | 0.364 | 0.547 |

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| --- | --- | --- | --- | --- |
| **Term** | **SS** | **MS** | ***F*-value** | ***p*-value** |
| Simpson Diversity | 0.476 | 0.476 | 0.717 | 0.399 |
| Treatment | 0.357 | 0.357 | 0.537 | 0.465 |
| Block | 7.452 | 7.452 | 11.211 | 0.001\*\* |
| Root architecture | 1.398 | 1.398 | 2.103 | 0.149 |
| Simpson Diversity × Treatment | 0 | 0 | 0 | 0.985 |
| Simpson Diversity × Block | 2.005 | 2.005 | 3.016 | 0.084 |
| Simpson Diversity × Root architecture | 0.18 | 0.18 | 0.271 | 0.604 |