**Supporting information for**

**Spatial facilitation and competition mechanisms regulate tree species assembly**

**in a tropical dry forest community, Colombia**

List of electronic supplementary data.

**Appendix A**. Photos from the study site and the plot subdivided into subplots of 10 m x 10 m

|  |  |
| --- | --- |
| **C:\Users\Usuario\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Cloma mosaicPlot.png**  N | **Cloma drone yellow3** |
|  |

**Appendix B.** Additional information on methodology.

**Table B1.** Species composition of the 1 ha study plot in a Méndez - Tolima dry forest. The 8 selected species for this study are highlight in grey.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Rank** | **Species** | **Abundance**  **(No)** | **Percentage (%)** | **Basal area**  **(m2 / ha)** | **Mean DBH (cm)** | **Mean height (m)** |
| 1 | *Trichilia oligofoliolata* | 750 | 21.169 | 2.447 | 5.7 | 7 |
| 2 | *Mayna odorata* | 422 | 11.911 | 0.617 | 4.1 | 5 |
| 3 | *Bauhinia petiolata* | 246 | 6.943 | 0.394 | 4.3 | 6 |
| 4 | *Aspidosperma polyneuron* | 199 | 5.617 | 3.144 | 11.8 | 11 |
| 5 | *Hippocratea volubilis* | 190 | 5.363 | 0.215 | 3.7 | 5 |
| 6 | *Trichilia elegans* | 177 | 4.996 | 0.872 | 7.1 | 9 |
| 7 | *Machaerium capote* | 140 | 3.951 | 1.601 | 10.6 | 11 |
| 8 | *Astronium graveolens* | 139 | 3.923 | 2.800 | 14.2 | 14 |
| 9 | *Pterocarpus rohrii* | 129 | 3.641 | 1.643 | 10.8 | 12 |
| 10 | *Swartzia trianae* | 120 | 3.387 | 0.492 | 5.7 | 8 |
| 11 | *Casearia sylvestris* | 104 | 2.935 | 0.754 | 8.9 | 10 |
| 12 | *Trichilia pallida* | 100 | 2.822 | 0.824 | 9.0 | 11 |
| 13 | *Eugenia procera* | 86 | 2.427 | 0.305 | 6.0 | 7 |
| 14 | *Machaerium sp6* | 69 | 1.948 | 0.705 | 10.7 | 11 |
| 15 | *Trichilia carinata* | 64 | 1.806 | 0.219 | 5.9 | 8 |
| 16 | *Malpighia glabra* | 45 | 1.270 | 0.052 | 3.7 | 4 |
| 17 | *Platymiscium pinnatum* | 44 | 1.242 | 0.590 | 11.3 | 12 |
| 18 | *Machaerium sp1* | 43 | 1.214 | 0.056 | 3.9 | 5 |
| 19 | *Triplaris melaenodendron* | 41 | 1.157 | 0.293 | 8.9 | 12 |
| 20 | *Coccoloba sp1* | 35 | 0.988 | 0.315 | 8.8 | 9 |
| 21 | *Bauhinia hymenaeifolia* | 34 | 0.960 | 0.034 | 3.5 | 5 |
| 22 | *Cordia gerascanthus* | 29 | 0.819 | 0.242 | 9.8 | 12 |
| 23 | *Pouteria sp7* | 28 | 0.790 | 0.207 | 8.4 | 10 |
| 24 | *Calliandra magdalenae* | 27 | 0.762 | 0.151 | 7.9 | 10 |
| 25 | *Croton schiedeanus* | 26 | 0.734 | 0.044 | 4.4 | 6 |
| 26 | *Amyris pinnata* | 24 | 0.677 | 0.194 | 9.3 | 10 |
| 27 | *Combretum fruticosum* | 22 | 0.621 | 0.027 | 3.9 | 5 |
| 28 | *Zanthoxylum sp2* | 21 | 0.593 | 0.151 | 8.3 | 11 |
| 29 | *Randia armata* | 19 | 0.536 | 0.121 | 8.2 | 9 |
| 30 | *Eugenia sp3* | 16 | 0.452 | 0.030 | 4.6 | 6 |
| 31 | *Bursera simaruba* | 15 | 0.423 | 1.142 | 30.1 | 17 |
| 32 | *Ziziphus strychnifolia* | 15 | 0.423 | 0.200 | 12.2 | 10 |
| 33 | *Neea sp1* | 13 | 0.367 | 0.052 | 6.6 | 7 |
| 34 | *Casearia praecox* | 12 | 0.339 | 0.159 | 10.9 | 13 |
| 35 | *Cynophalla polyantha* | 12 | 0.339 | 0.092 | 8.8 | 9 |
| 36 | *Pseudobombax septenatum* | 11 | 0.310 | 1.334 | 35.6 | 16 |
| 37 | *Seguieria americana* | 11 | 0.310 | 0.024 | 5.0 | 7 |
| 38 | *Tabebuia rosea* | 11 | 0.310 | 0.573 | 24.4 | 17 |
| 39 | *Senegalia sp1* | 8 | 0.226 | 0.202 | 16.3 | 13 |
| 40 | *Celtis iguanaea* | 7 | 0.198 | 0.082 | 11.1 | 11 |
| 41 | *Forsteronia sp1* | 6 | 0.169 | 0.006 | 3.5 | 5 |
| 42 | *Guettarda comata* | 6 | 0.169 | 0.049 | 10.0 | 9 |
| 43 | *Casearia corymbosa* | 5 | 0.141 | 0.063 | 11.4 | 14 |
| 44 | *Rinorea sp1* | 4 | 0.113 | 0.019 | 7.2 | 9 |
| 45 | *Randia aculeata* | 3 | 0.085 | 0.002 | 2.8 | 4 |
| 46 | *Ampelocera sp1* | 2 | 0.056 | 0.021 | 11.5 | 17 |
| 47 | *Cynophalla flexuosa* | 2 | 0.056 | 0.014 | 8.8 | 4 |
| 48 | *Simira cordifolia* | 2 | 0.056 | 0.032 | 13.9 | 13 |
| 49 | *Bunchosia sp* | 1 | 0.028 | 0.001 | 3.4 | 5 |
| 50 | *Casearia sp1* | 1 | 0.028 | 0.007 | 9.6 | 12 |
| 51 | *Croton sp* | 1 | 0.028 | 0.004 | 6.9 | 11 |
| 52 | *Diospyros sp2* | 1 | 0.028 | 0.001 | 3.5 | 10 |
| 53 | *Esenbeckia alata* | 1 | 0.028 | 0.001 | 3.5 | 6 |
| 54 | *Handroanthus ochraceus* | 1 | 0.028 | 0.031 | 19.8 | 17 |
| 55 | *Morf sp1* | 1 | 0.028 | 0.001 | 2.8 | 4 |
| 56 | *Quadrella odoratissima* | 1 | 0.028 | 0.098 | 35.4 | 16 |
| 57 | *Ruprechtia sp1* | 1 | 0.028 | 0.001 | 3.2 | 6 |
|  | **Total general** | **3543** | **100** | **23.7** | **7.3** | **8** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *Trichilia oligofoliata* | *Aspidosperma polyneuron* | *Trichilia elegans* | *Machaerium capote* |
| **Abundance** |  |  |  |  |
|  | *Astronium graveloens* | *Pterocarpus rohii* | *Casearia sylvestris* | *Trichilia pallida* |
| **Abundance** |  |  |  |  |
|  | **DBH class [cm]** | **DBH class [cm]** | **DBH class [cm]** | **DBH class [cm]** |

**Figure B1**. Size distributions (diameter at beast height-DBH) of the eight tree species used in our analysis

|  |
| --- |
|  |

**Figure B2.** Box plots of size of the tree (height (m)) for the 8 species in the study plot. Red dashed line, average height of all individual trees (3543) in the plot. Tp *Trichilia oligofoliolata*, Te *Trichilia elegans*, Cs *Casearia sylvestris*, Tp *Trichilia pallida*, Mc *Macha1erium capote*, Ap *Aspidosperma* *polyneuron,* Pr *Pterocarpus rohrii* and Ag *Astronium graveolens*.

**Appendix C.** Summary results of principal component analysis for the 15 species and 8 functional traits quantified in this study**.**

**Table C1.** Summary results of Principal Component Analysis. Eigenvalue, variance and loadings of functional traits on principal components corresponding to Figure 4. The most correlated functional traits with each of the eight selected **PC** (loadings) have been highlighted in bold letters.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Principal Component** | | | | | | | |
| **Variability per component** | | **PC1** | **PC2** | **PC3** | **PC4** | **PC5** | **PC6** | **PC7** | **PC8** |
| Eigenvalue | | 3.581 | 1.515 | 1.003 | 0.884 | 0.582 | 0.329 | 0.092 | 0.01 |
| % of variance explained | | 44.769 | 18.941 | 12.541 | 11.062 | 7.283 | 4.119 | 1.154 | 0.127 |
| Cumulative variance | | 44.769 | 63.71 | 76.252 | 87.314 | 94.597 | 98.717 | 99.872 | 100 |
|  |  |  |  |  |  |  |  |  |  |
|  | | **Loadings** | | | | | | | |
| **Functional trait** | | **PC1** | **PC2** | **PC3** | **PC4** | **PC5** | **PC6** | **PC7** | **PC8** |
| Leaf dry matter content (LDMC) | | 0.284 | –**0.700** | 0.190 | –0.451 | –0.373 | 0.218 | 0.012 | 0.001 |
| Specific leaf area (SLA) | | –0.397 | 0.312 | **0.738** | 0.358 | –0.083 | 0.249 | 0 | 0.002 |
| Vessel density (VD) | | **0.624** | 0.469 | –0.435 | 0.173 | –0.315 | 0.230 | –0.130 | 0.007 |
| Xylem potent. hydrau conduct. (Kh) | | –**0.636** | –0.293 | –0.290 | 0.497 | –0.393 | –0.066 | 0.128 | –0.007 |
| Vessel area (VA) | | –**0.907** | –0.210 | 0.104 | –0.017 | –0.171 | –0.207 | –0.221 | 0.013 |
| Wood Density (WD) | | **0.906** | –0.094 | 0.261 | 0.188 | –0.130 | –0.202 | –0.051 | –0.069 |
| Water cont–fib. satu. point (WCfsp) | | –**0.914** | 0.073 | –0.233 | –0.192 | 0.117 | 0.217 | –0.028 | –0.070 |
| Maximum height (MH) | | –0.259 | **0.748** | 0.113 | –0.448 | –0.347 | –0.175 | 0.078 | –0.005 |

In bold appears the traits more related to each **PC**.

**Table C2.** Pairwise Pearson’s correlation analyses between functional traits testing the linkages among the 8 functional traits, with their respective significance level. Significant correlations between traits (P value < 0.05) are indicated in bold. Leaf dry matter content (LDMC), specific leaf area (SLA), vessel density (VD), xylem potential hydraulic conductivity (Kh), vessel area (VA), wood density (WD), water content–fibre saturation point (WCfsp) and maximum height of trees (MH).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | LDMC | SLA | VD | Kh | VA | WD | WCfsp | MH |
| LDMC | 1.0 |  |  |  |  |  |  |  |
| SLA | **–0.32** | 1.0 |  |  |  |  |  |  |
| VD | –0.07 | **–0.24** | 1.0 |  |  |  |  |  |
| Kh | –0.06 | 0.02 | –0.18 | 1.0 |  |  |  |  |
| VA | –0.03 | **0.21** | **–0.63** | **0.58** | 1.0 |  |  |  |
| WD | **0.27** | –0.12 | **0.34** | –**0.34** | **–0.56** | 1.0 |  |  |
| WCfsp | **–0.25** | 0.11 | **–0.35** | **0.33** | **0.55** | **–0.99** | 1.0 |  |
| MH | –0.19 | **0.21** | 0.05 | –0.08 | **0.30** | **–0.28** | **0.25** | 1.0 |

**Table D1.** Analysis 1.Summary of spatial association patterns between the 8 species in the 1 ha plot for each distance *r.* The numbers correspond to the spatial association patterns defined by the two dimensional scheme, 0: independence, 1: segregation, 2: partial overlap, 3: mixing, 4: type 4.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Specie 1 | Specie 2 | Spatial scale r [m] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| *T. oligofoliata* | *A. polyneuron* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. oligofoliata* | *T. elegans* | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. oligofoliata* | *M. capote* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. oligofoliata* | *A. graveloens* | 0 | 0 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. oligofoliata* | *P. rohii* | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. oligofoliata* | *C. sylvestris* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. oligofoliata* | *T. pallida* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. polyneuron* | *T. oligofoliata* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. polyneuron* | *T. elegans* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| *A. polyneuron* | *M. capote* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. polyneuron* | *A. graveloens* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. polyneuron* | *P. rohii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. polyneuron* | *C. sylvestris* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. polyneuron* | *T. pallida* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. elegans* | *T. oligofoliata* | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| *T. elegans* | *A. polyneuron* | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. elegans* | *M. capote* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. elegans* | *A. graveloens* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. elegans* | *P. rohii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. elegans* | *C. sylvestris* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. elegans* | *T. pallida* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *M. capote* | *T. oligofoliata* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *M. capote* | *A. polyneuron* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *M. capote* | *T. elegans* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *M. capote* | *A. graveloens* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *M. capote* | *P. rohii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *M. capote* | *C. sylvestris* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *M. capote* | *T. pallida* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. graveloens* | *T. oligofoliata* | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. graveloens* | *A. polyneuron* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. graveloens* | *T. elegans* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. graveloens* | *M. capote* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. graveloens* | *P. rohii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. graveloens* | *C. sylvestris* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *A. graveloens* | *T. pallida* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| *P. rohii* | *T. oligofoliata* | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *P. rohii* | *A. polyneuron* | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *P. rohii* | *T. elegans* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *P. rohii* | *M. capote* | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *P. rohii* | *A. graveloens* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *P. rohii* | *C. sylvestris* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *P. rohii* | *T. pallida* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. sylvestris* | *T. oligofoliata* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. sylvestris* | *A. polyneuron* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. sylvestris* | *T. elegans* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. sylvestris* | *M. capote* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. sylvestris* | *A. graveloens* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. sylvestris* | *P. rohii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *C. sylvestris* | *T. pallida* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. pallida* | *T. oligofoliata* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. pallida* | *A. polyneuron* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. pallida* | *T. elegans* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| *T. pallida* | *M. capote* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. pallida* | *A. graveloens* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. pallida* | *P. rohii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *T. pallida* | *C. sylvestris* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. cases type 0 (independence) | | 56 | 52 | 51 | 50 | 48 | 48 | 49 | 48 | 48 | 48 | 48 | 45 | 47 | 46 | 48 | 48 | 50 | 49 | 51 | 52 | 52 | 53 | 52 | 52 | 51 | 54 | 54 | 54 | 55 | 55 | 55 |
| No. cases type 1 (segregation) | | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 6 | 6 | 7 | 5 | 5 | 4 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 1 | 1 | 0 | 0 | 1 |
| No. cases type 2 (part. overlap) | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 0 |
| No. cases type 3 (mixing) | | 0 | 4 | 4 | 5 | 6 | 6 | 5 | 5 | 6 | 5 | 5 | 6 | 4 | 3 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| No. cases type 4 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Table D2.** Analysis 2.Summary of analysis of species interactions between the 8 species in the 1 ha study plot. The symbol + means significant positive interaction; – means significant negative interaction*,* basedon the bivariate pair-correlation function. Significance was assessed using 199 simulations of the null-model. *P-value* of the global envelopes were assessed over the 0-30m range of spatial scales*.*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Species 1 | Species 2 | Rank (GoF test) | Spatial scale *r* [m] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | *p-*value |
| *T. oligofoliata* | *T. elegans* | 198 | **+** | **+** | **+** | **+** | **+** | **+** |  |  |  |  |  |  |  |  |  | – |  | – |  |  |  |  | – | – | – | – | – | – | – | – |  | 0.01 |
| *T. oligofoliata* | *M. capote* | 27 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.87 |
| *T. oligofoliata* | *A. graveloens* | 31 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.85 |
| *T. oligofoliata* | *A. polyneuron* | 66 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.67 |
| *T. oligofoliata* | *P. rohii* | 191 | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.05 |
| *T. oligofoliata* | *T. pallida* | 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.99 |
| *T. oligofoliata* | *C. sylvestris* | 135 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.33 |
| *T. elegans* | *T. oligofoliata* | 191 | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.05 |
| *T. elegans* | *M. capote* | 84 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.58 |
| *T. elegans* | *A. graveloens* | 18 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.67 |
| *T. elegans* | *A. polyneuron* | 190 |  | – | – | – | – | – | – |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.07 |
| *T. elegans* | *P. rohii* | 189 |  |  |  | **+** |  | **+** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.08 |
| *T. elegans* | *T. pallida* | 6 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.97 |
| *T. elegans* | *C. sylvestris* | 79 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.61 |
| *M. capote* | *T. oligofoliata* | 53 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.74 |
| *M. capote* | *T. elegans* | 177 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.12 |
| *M. capote* | *A. graveloens* | 154 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.23 |
| *M. capote* | *A. polyneuron* | 188 |  |  |  |  |  | – | – |  |  |  |  |  |  |  |  |  | – |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.08 |
| *M. capote* | *P. rohii* | 93 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.42 |
| *M. capote* | *T. pallida* | 35 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.83 |
| *M. capote* | *C. sylvestris* | 158 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.45 |
| *A. graveloens* | *T. oligofoliata* | 190 |  |  | **+** | **+** | **+** | **+** |  | **+** | **+** | **+** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.05 |
| *A. graveloens* | *T. elegans* | 77 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.62 |
| *A. graveloens* | *M. capote* | 146 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.27 |
| *A. graveloens* | *A. polyneuron* | 25 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.88 |
| *A. graveloens* | *P. rohii* | 69 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.66 |
| *A. graveloens* | *T. pallida* | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.85 |
| *A. graveloens* | *C. sylvestris* | 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.92 |
| *A. polyneuron* | *T. oligofoliata* | 43 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.79 |
| *A. polyneuron* | *T. elegans* | 192 |  |  | – | – | – | – | – | – | – |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.05 |
| *A. polyneuron* | *M. capote* | 7 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.97 |
| *A. polyneuron* | *A. graveloens* | 4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.98 |
| *A. polyneuron* | *P. rohii* | 193 | – | – |  | – | – | – | – |  |  |  | – |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.04 |
| *A. polyneuron* | *T. pallida* | 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.99 |
| *A. polyneuron* | *C. sylvestris* | 33 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.84 |
| *P. rohii* | *T. oligofoliata* | 196 | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** | **+** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.02 |
| *P. rohii* | *T. elegans* | 188 |  |  |  | **+** |  | **+** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.09 |
| *P. rohii* | *M. capote* | 150 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.25 |
| *P. rohii* | *A. graveloens* | 25 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.88 |
| *P. rohii* | *A. polyneuron* | 192 | – | – |  | – | – | – | – |  |  |  | – |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.04 |
| *P. rohii* | *T. pallida* | 7 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.97 |
| *P. rohii* | *C. sylvestris* | 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.99 |
| *T. pallida* | *T. oligofoliata* | 7 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.97 |
| *T. pallida* | *T. elegans* | 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.85 |
| *T. pallida* | *M. capote* | 24 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.88 |
| *T. pallida* | *A. graveloens* | 31 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.85 |
| *T. pallida* | *A. polyneuron* | 13 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.94 |
| *T. pallida* | *P. rohii* | 42 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.79 |
| *T. pallida* | *C. sylvestris* | 82 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.59 |
| *C. sylvestris* | *T. oligofoliata* | 19 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.89 |
| *C. sylvestris* | *T. elegans* | 139 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.31 |
| *C. sylvestris* | *M. capote* | 20 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.86 |
| *C. sylvestris* | *A. gaveloens* | 16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.92 |
| *C. sylvestris* | *A. polyneuron* | 48 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.76 |
| *C. sylvestris* | *P. rohii* | 11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.95 |
| *C. sylvestris* | *T. pallida* | 61 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0.70 |

**Appendix E.** Additional spatial analyses

|  |  |  |  |
| --- | --- | --- | --- |
| *Trichilia oligofoliata* | *Aspidosperma polyneuron* | *Trichilia elegans* | *Machaerium capote* |
| u = 200  P-value = 0.005 | u = 200  P-value = 0.005 | u = 200  P-value = 0.005 | u = 124  P-value = 0.120 |
| *Astronium graveloens* | *Pterocarpus rohii* | *Casearia sylvestris* | *Trichilia pallida* |
| u = 195  P-value = 0.030 | u = 200  P-value = 0.005 | u = 200  P-value = 0.005 | u = 200  P-value = 0.005 |

**Figure E1**. Univariate analysis of all trees for the 8 species at the distance interval 0 m – 30 m. The pair-correlation function g11(*r*) of the observed data (disks), simulation envelopes of the heterogeneous Poisson null model (thin solid lines) and the expected pair-correlation function of the null-model (grey line). An Epanechnikov kernel with bandwidth = 30 m was used to estimate the non-parametric intensity functions. The spatial resolution to compute g11(*r*) was 1m × 1 m. Simulation envelopes were constructed using the 5th highest and lowest g11(*r*) from 199 replicates of the null-model. Red indicates non-significant results.

|  |  |  |  |
| --- | --- | --- | --- |
| *Trichilia oligofoliata* | *Aspidosperma polyneuron* | *Trichilia elegans* | *Machaerium capote* |
| u = 200  P-value = 0.005 | u = 200  P-value = 0.005 | u = 200  P-value = 0.005 | u = 189  P-value = 0.060 |
| *Astronium graveloens* | *Pterocarpus rohii* | *Casearia sylvestris* | *Trichilia pallida* |
| u = 190  P-value = 0.055 | u = 200  P-value = 0.005 | u = 200  P-value = 0.005 | u = 188  P-value = 0.065 |

**Figure E2.** Same as Fig. E1, but for small (DBH < 10 cm) trees.

|  |  |  |  |
| --- | --- | --- | --- |
| *Trichilia oligofoliata* | *Aspidosperma polyneuron* | *Trichilia elegans* | *Machaerium capote* |
| u = 199  P-value = 0.010 | u = 200  P-value = 0.005 | u = 10  P-value = 0.955 | u = 84  P-value = 0.585 |
| *Astronium graveloens* | *Pterocarpus rorhii* | *Casearia sylvestris* | *Trichilia pallida* |
| u = 106  P-value = 0.475 | u = 36  P-value = 0.825 | u = 169  P-value = 0.160 | u = 19  P-value = 0.910 |

**Figure E3.** Same as Fig. E1, but for large (DBH ≥ 10 cm) trees.

|  |  |  |  |
| --- | --- | --- | --- |
| *Trichilia oligofoliata* | *Aspidosperma polyneuron* | *Trichilia elegans* | *Machaerium capote* |
| u = 200  P-value = 0.005 | u = 200  P-value = 0.005 | u = 200  P-value = 0.005 | u = 44  P-value = 0.830 |
| *Astronium graveloens* | *Pterocarpus rorhii* | *Casearia sylvestris* | *Trichilia pallida* |
| u = 200  P-value = 0.005 | u = 200  P-value = 0.005 | u = 93  P-value = 0.540 | u = 34  P-value = 0.835 |

**Figure E4.** Same as Fig. E1, but for the bivariate pattern of Bivariate analysis of small (DBH ≤ 10 cm) trees around the focal pattern of large (DBH ≥ 10 cm) (DBH ≤ 10 cm) trees. The kept the locations of large trees unchanged randomized the location of conspecific small trees following a heterogeneous Poisson process with an Epanechnikov kernel with bandwidth = 30 m to estimate the non-parametric intensity functions.

**Appendix F.** Additional information on (4.1. Interpretations of the overall network of species interactions).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Slope** | *Trichilia oligofoliata* | *Aspidosperma polyneuron* | *Trichilia elegans* | *Machaerium capote* |
| **Degree** |  | C:\Users\Usuario\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Ap_slope.tif |  | C:\Users\Usuario\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Mc_slope.tif |
|  | *Astronium graveloens* | *Pterocarpus rorhii* | *Casearia sylvestris* | *Trichilia pallida* |
|  | C:\Users\Usuario\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Ag_slope.tif |  |  |  |

**Figure F1.** Spatial distribution of saplings (red-orange dots) and matures (black dots) trees of the 8 species in relation to the topography (slope in degrees) for the 1 ha study plot. An elevation ranging from 320 to 368 m. a. s. l.

**Appendix G.** Additional information on (4.2 analysis of small-scale species associations).

|  |  |  |
| --- | --- | --- |
| *T. oligofoliata* saplings vs *A. graveloens* | *T. oligofoliata* saplings vs *P. rohrii* | *T. oligofoliata* saplings vs *T. elegans* |
|  |  |  |

**Figure G1.** Bivariate analysis of *T. oligofoliata* saplings (DBH ≤ 10 cm) in the neighbourhood of all trees of the species *A. graveloens* (left), *P. rohrii* (middle) and *T. elegans* (right). *T. oligofoliata* showed positive spatial associations to these 3 specie. Bivariate pair-correlation function g12(*r*) of the observed data (disks), simulation envelopes of a heterogeneous Poisson null model (thin solid lines) and the expected g12(*r*) of the null-model (grey line). An Epanechnikov kernel with bandwidth = 30 m was used to estimate the intensity function of given point pattern. The spatial resolution to compute the g12(*r*) was 1m×1 m. Simulation envelopes were constructed based on the 5th highest and lowest g12(*r*) values from 199 replicates of the null-model. Red colour indicates non-significant results over the 0-30m distance interval.

|  |  |  |  |
| --- | --- | --- | --- |
| *T. oligofoliata* vs *A. polyneuron* | *T. oligofoliata* vs *T. elegans* | *T. oligofoliata* vs *M. capote* | *T. oligofoliata* vs *A. graveloens* |
| u = 21  P-value = 0.780 | u = 200  P-value = 0.005 | u = 71  P-value = 0.650 | u = 72  P-value = 0.650 |
| *T. oligofoliata* vs *P. rohrii* | *T. oligofoliata* vs *C. sylvestris* | *T. oligofoliata* vs *T. pallida* |  |
| u = 200  P-value = 0.005 | u = 172  P-value = 0.625 | u = 56  P-value = 0.580 |  |

**Figure G2.** Same as Fig. G1, but for *Trichilia oligofoliata* saplings (DBH ≤ 10 cm) vs. saplings (DBH ≤ 10 cm) of the 7 other species.

|  |  |  |  |
| --- | --- | --- | --- |
| *T. oligofoliata* vs *A. polyneuron* | *T. oligofoliata* vs *T. elegans* | *T. oligofoliata* vs *M. capote* | *T. oligofoliata* vs *A. graveloens* |
| u = 103  P-value = 0.230 | u = 166  P-value = 0.255 | u = 41  P-value = 0.915 | u = 72  P-value = 0.650 |
| *T. oligofoliata* vs *P. rohrii* | *T. oligofoliata* vs *C. sylvestris* | *T. oligofoliata* vs *T. pallida* |  |
| u = 150  P-value = 0.250 | u = 83  P-value = 0.845 | u = 121  P-value = 0.130 |  |

**Figure G3.** Same as Fig. G1, but for *Trichilia oligofoliata* saplings (DBH ≤ 10 cm) vs. large trees (DBH ≤ 10 cm) of the 7 other species.