**Supplementary material**

S1. Data for decay coefficients (*k*) for leaf and fine root decomposition and local environmental variables analyzed at each sampling point. *k* (leaf) = decay coefficient for leaf; *k* (roots) = decay coefficient for fine root; S.plant = plant species richness (number of species); D.plant = density of individual plants (ind.m-²); B.plant = aerial plant biomass (kg.plot-1); O.macro = order richness of terrestrial invertebrates (number of orders); D.macro = density of the macrofauna of terrestrial invertebrates (ind.m-2); L.prod = litter production (Mg.ha-1.year-1); F.roots = fine root stock (g.m-2); Sand = fraction of sand in the soil (g.kg-1); Clay = fraction of clay in the soil (g.kg-1); Silt = fraction of silt in th soil (g.kg-1); SOM = soil organic matter (g.dm-3); and pH. In some plots, leaf and fine root material were excluded from the analyses due to the loss of their litterbags in the field. Empty cells for some of the analyzed variables are due to the inability to execute the phytosociological study at three of the sample points.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Points** | ***k* (leaf)** | ***k* (root)** | **S.plant** | **D.plant** | **B.plant** | **O.macro** | **D.macro** | **L.prod** | **F.roots** | **Sand** | **Clay** | **Silt** | **SOM** | **pH** |
| 1 | 0.1575 | 0.05248 | 7 | 0.92 | 305.6745 | 7 | 67 | 12.65 | 1.447 | 877 | 20 | 103 | 19.08 | 5.91 |
| 2 | 0.1245 | 0.05274 | 8 | 0.85 | 242.4057 | 0 | 0 | 7.71 | 0.511 | 620 | 100 | 280 | 39.31 | 4.75 |
| 3 | 0.1203 | 0.06887 | 8 | 0.91 | 240.6885 | 7 | 106 | 1.72 | 0.732 | 740 | 80 | 180 | 28.27 | 4.75 |
| 4 | 0.1423 | 0.05436 | 10 | 0.75 | 239.7844 | 8 | 127 | 2.2 | 0.79 | 744 | 40 | 216 | 35.17 | 4.99 |
| 5 | 0.1136 | 0.04685 | 5 | 0.75 | 234.3183 | 9 | 27 | 8.2 | 0.714 | 657 | 80 | 263 | 26.89 | 5.38 |
| 6 | 0.1785 | 0.06500 | 8 | 0.52 | 176.0999 | 5 | 80 | 5.14 | 0.697 | 845 | 20 | 135 | 19.31 | 5.6 |
| 7 | 0.2576 | 0.04532 | 8 | 0.39 | 141.1633 | 8 | 33 | 5.22 | 0.46 | 678 | 100 | 222 | 30.8 | 5.49 |
| 8 | 0.09447 | 0.05493 | 8 | 0.52 | 251.5308 | 4 | 10 | 4.56 | 1.193 | 761 | 80 | 159 | 32.64 | 5.95 |
| 9 | 0.1304 | 0.06674 | 7 | 0.62 | 206.6920 | 5 | 10 | 4.22 | 1.147 | 768 | 80 | 152 | 28.27 | 4.65 |
| 10 | 0.1627 | 0.04620 | 3 | 0.33 | 152.5601 | 6 | 30 | 7.13 | 0.416 | 653 | 60 | 287 | 29.42 | 6.64 |
| 11 | 0.1976 |  | 10 | 0.75 | 232.0200 | 8 | 68 | 2.21 | 0.451 | 648 | 80 | 272 | 43.9 | 5.48 |
| 12 | 0.1881 |  | 10 | 0.6 | 189.2110 | 9 | 228 | 5.04 | 0.573 | 797 | 60 | 143 | 37.01 | 5.05 |
| 13 | 0.2190 | 0.06400 | 9 | 0.34 | 120.0914 | 8 | 135 | 2.8 | 0.53 | 691 | 60 | 249 | 25.52 | 5.33 |
| 14 | 0.07351 | 0.05457 |  |  |  | 6 | 56 | 6.03 | 1.041 | 755 | 40 | 205 | 38.62 | 5.39 |
| 15 | 0.1557 | 0.07681 | 8 | 0.78 | 153.6752 | 7 | 187 | 5.98 | 0.763 | 596 | 120 | 284 | 32.18 | 5.14 |
| 16 | 0.1332 | 0.05308 | 3 | 0.44 | 212.3127 | 8 | 91 | 8.57 | 0.67 | 715 | 60 | 225 | 31.26 | 4.85 |
| 17 | 0.4585 |  | 4 | 0.15 | 49.7276 | 7 | 79 | 2.67 | 0.259 | 826 | 20 | 154 | 18.16 | 6.12 |
| 18 | 0.1620 | 0.05457 | 7 | 0.62 | 191.0035 | 9 | 170 | 8.07 | 0.568 | 624 | 100 | 276 | 49.88 | 5.35 |
| 19 | 0.1559 | 0.05789 |  |  |  | 9 | 275 | 4.66 | 0.766 | 621 | 100 | 279 | 40.92 | 5.25 |
| 20 | 0.1680 | 0.05535 | 12 | 0.39 | 141.1576 | 7 | 93 | 4.17 | 0.587 | 701 | 60 | 239 | 32.64 | 5.33 |
| 21 | 0.1361 | 0.05567 | 11 | 0.48 | 164.7824 | 5 | 78 | 4.4 | 1.211 | 861 | 20 | 119 | 25.28 | 5.29 |
| 22 | 0.1898 | 0.05926 |  |  |  | 3 | 5 | 3.33 | 0.337 | 623 | 40 | 328 | 46.2 | 3.95 |
| 23 | 0.1539 | 0.05417 | 7 | 0.44 | 237.6700 | 8 | 43 | 4.53 | 1.112 | 729 | 60 | 211 | 35.63 | 4.93 |
| 24 | 0.1773 | 0.06057 | 9 | 0.38 | 214.4012 | 2 | 34 | 2.37 | 0.657 | 816 | 20 | 164 | 30.11 | 5.63 |
| 25 | 0.1562 | 0.05840 | 15 | 0.41 | 177.9758 | 8 | 30 | 2.37 | 0.716 | 767 | 60 | 173 | 43.9 | 5.11 |
| 26 | 0.1579 | 0.06697 | 10 | 0.32 | 208.6666 | 4 | 15 | 3.3 | 0.494 | 924 | 20 | 56 | 7.59 | 6.49 |
| 27 | 0.1730 | 0.07477 | 11 | 0.38 | 123.2301 | 6 | 50 | 1.96 | 0.775 | 733 | 60 | 207 | 28.73 | 4.93 |
| 28 | 0.1241 | 0.05879 | 8 | 0.28 | 155.7748 | 7 | 120 | 3.37 | 0.61 | 736 | 100 | 164 | 24.6 | 4.76 |
| 29 |  | 0.05223 | 10 | 0.6 | 189.2110 | 9 | 228 | 5.04 | 0.573 | 797 | 60 |  | 37.01 | 5.05 |
| 30 |  | 0.06085 | 7 | 0.32 | 147.7432 | 3 | 47 | 2.25 | 0.663 | 924 | 40 |  | 24.6 | 4.62 |

S2. Pearson correlation matrix for local environmental variables analyzed at each sampling point. *k* (leaf) = decay coefficient for leaf; *k* (roots) = decay coefficient for fine root; S.plant = plant species richness (number of species); D.plant = density of individual plants (ind.m-²); B.plant = aerial plant biomass (kg.plot-1); O.macro = order richness of terrestrial invertebrates (number of orders); D.macro = density of the macrofauna of terrestrial invertebrates (ind.m-2); L.prod = litter production (Mg.ha-1.year-1); F.roots = fine root stock (g.m-2); Sand = fraction of sand in the soil (g.kg-1); Clay = fraction of clay in the soil (g.kg-1); Silt = fractions of silt in the soil (g.kg-1); SOM = soil organic matter (g.dm-3); and pH.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ***k* (leaf)** | ***k* (root)** | **S.plant** | **D.plant** | **B.plant** | **O.macro** | **D.macro** | **L.prod** | **F.roots** | **Sand** | **Clay** | **Silt** | **SOM** | **pH** |
| ***k* (leaf)** | 1.000 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ***k* (root)** | 0.085 | 1.000 |  |  |  |  |  |  |  |  |  |  |  |  |
| **S.plant** | 0.202 | 0.351 | 1.000 |  |  |  |  |  |  |  |  |  |  |  |
| **D.plant** | -0.387 | -0.022 | -0.177 | 1.000 |  |  |  |  |  |  |  |  |  |  |
| **B.plant** | -0.552\* | -0.376 | -0.266 | 0.650\* | 1.000 |  |  |  |  |  |  |  |  |  |
| **O.macro** | 0.196 | -0.160 | -0.098 | -0.022 | -0.182 | 1.000 |  |  |  |  |  |  |  |  |
| **D.macro** | 0.133 | 0.233 | 0.008 | 0.160 | -0.283 | 0.513\* | 1.000 |  |  |  |  |  |  |  |
| **L.prod** | -0.116 | -0.470\* | -0.603\* | 0.417 | 0.414 | 0.097 | -0.010 | 1.000 |  |  |  |  |  |  |
| **E.roots** | -0.370 | -0.039 | 0.042 | 0.358 | 0.525\* | -0.012 | -0.128 | 0.216 | 1.000 |  |  |  |  |  |
| **Sand** | -0.016 | 0.209 | 0.317 | -0.163 | 0.281 | -0.270 | -0.310 | -0.168 | 0.443\* | 1.000 |  |  |  |  |
| **Clay** | -0.123 | -0.015 | -0.219 | 0.195 | -0.195 | 0.204 | 0.236 | 0.083 | -0.278 | -0.830\* | 1.000 |  |  |  |
| **Silt** | 0.079 | -0.349 | -0.333 | 0.099 | -0.274 | 0.269 | 0.257 | 0.185 | -0.484\* | -0.947\* | 0.618\* | 1.000 |  |  |
| **SOM** | -0.085 | -0.374 | 0.091 | 0.147 | -0.026 | 0.201 | 0.191 | 0.020 | -0.110 | -0.655\* | 0.518\* | 0.655\* | 1.000 |  |
| **pH** | -0.220 | -0.145 | -0.153 | 0.267 | 0.027 | -0.152 | -0.265 | -0.235 | 0.234 | 0.0318 | -0.418 | -0.229 | -0.419 | 1.000 |

\*P< 0.05