

Supplementary Information

Forest gap size can efficiently promote litter decomposition and nutrient release in southwestern China

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Table S1: Initial concentrations of carbon (C), nitrogen (N) and phosphorus (P) in the litter of *Pinus massoniana* and *Toona ciliata* (mean $\pm$ SE). Data with different upper-case letters within the same column show significant differences between *Pinus massoniana* and *Toona ciliata* leaf litter ($p < 0.05$).

Tree species	C/N	C/P	N/P	C /g·kg ⁻¹	N /g·kg ⁻¹	P /g·kg ⁻¹
<i>Pinus massoniana</i>	70.79 $\pm$ 1.63 A	771.99 $\pm$ 47.58 A	10.90 $\pm$ 0.43 B	451.75 $\pm$ 8.01 B	6.38 $\pm$ 0.18 B	0.59 $\pm$ 0.04 B
<i>Toona ciliata</i>	14.81 $\pm$ 0.94 B	343.71 $\pm$ 12.56 B	21.21 $\pm$ 1.61 A	574.00 $\pm$ 29.5 7A	38.76 $\pm$ 0.2 4A	1.67 $\pm$ 0.03 A

Table S2: Litterbag temperature records for forest gaps and closed canopy during the 1.5-year experiment. CK = closed canopy as control. Different upper-case letters within the same row indicate significant differences between decomposition stages; different lower-case letters within the same column indicate significant differences between forest gaps ($p < 0.05$).

Forest gaps / m ²	0-90 days	90-180 days	180-270 days	270-360 days	360-540 days
CK	9.85 $\pm$ 0.17Ebc	15.85 $\pm$ 0.14Cd	21.97 $\pm$ 0.50Abc	19.41 $\pm$ 0.09Bb	12.2 $\pm$ 0.31De
100	9.74 $\pm$ 0.16Ebc	17.97 $\pm$ 0.27Cb	22.75 $\pm$ 0.47Ab	20.33 $\pm$ 0.28Bab	12.63 $\pm$ 0.51Dde
225	9.22 $\pm$ 0.36Ec	16.89 $\pm$ 0.10Cc	22.16 $\pm$ 0.11Abc	20.84 $\pm$ 0.24Ba	13.18 $\pm$ 0.38Dcde
400	10.03 $\pm$ 0.19Dbc	16.39 $\pm$ 0.21Bcd	21.33 $\pm$ 0.48Ac	21 $\pm$ 0.070Aa	13.74 $\pm$ 0.32Cbcd
625	10.69 $\pm$ 0.57Cab	16.3 $\pm$ 0.18Bcd	21.79 $\pm$ 0.46Abc	21.04 $\pm$ 0.49Aa	15.14 $\pm$ 0.45Ca
900	8.95 $\pm$ 0.14Ec	15.87 $\pm$ 0.11Cd	21.12 $\pm$ 0.42Ac	19.7 $\pm$ 0.41Bb	13.47 $\pm$ 0.09Dcd
1225	11.71 $\pm$ 0.55Ea	18.72 $\pm$ 0.31Ca	23.94 $\pm$ 0.20Aa	20.83 $\pm$ 0.50Ba	14.9 $\pm$ 0.44Dab
1600	11.64 $\pm$ 0.09Ea	16.19 $\pm$ 0.37Ccd	22.12 $\pm$ 0.28Abc	20.19 $\pm$ 0.20Bab	14.19 $\pm$ 0.30Dabc

Table S3: Soil water content records for forest gaps and closed canopy (CK) during the 1.5-year experiment. CK = closed canopy as control. Different upper-case letters within the same row indicate significant differences between decomposition stages; different lower-case letters within the same column indicate significant differences between forest gaps ($p < 0.05$).

Forest gaps / m ²	0–90 days	90–180 days	180–270 days	270–360 days	360–540 days
CK	14.52 $\pm$ 1.09Aa	13.95 $\pm$ 2.03Ab	16.76 $\pm$ 1.08Ac	17.46 $\pm$ 0.64Ab	15.75 $\pm$ 1.08Aa
100	21.26 $\pm$ 2.46ABa	20.22 $\pm$ 0.58ABa	24.05 $\pm$ 1.53Aa	25.43 $\pm$ 0.80Aa	15.23 $\pm$ 2.96Ba
225	19.84 $\pm$ 4.0Aa	19.21 $\pm$ 0.7Aab	23.27 $\pm$ 2.06Aabc	22.95 $\pm$ 1.13Aab	17.55 $\pm$ 2.65Aa
400	16.24 $\pm$ 2.15Aa	15.21 $\pm$ 2.77Aab	20.93 $\pm$ 1.75Aabc	20.85 $\pm$ 3.07Aab	19.04 $\pm$ 2.07Aa
625	16.84 $\pm$ 1.52Aa	17.26 $\pm$ 0.97Aab	19.90 $\pm$ 0.72Aabc	20.89 $\pm$ 2.06Aab	17.93 $\pm$ 0.58Aa
900	19.09 $\pm$ 0.98ABa	16.61 $\pm$ 0.35Bab	19.14 $\pm$ 1.45ABbc	20.30 $\pm$ 0.66Aab	17.34 $\pm$ 0.70ABa
1225	17.94 $\pm$ 1.53Aa	16.23 $\pm$ 2.63Aab	18.60 $\pm$ 0.84Ac	18.57 $\pm$ 1.87Ab	17.17 $\pm$ 2.06Aa
1600	17.72 $\pm$ 0.8Aa	15.93 $\pm$ 1.16Aab	17.95 $\pm$ 0.85Ac	18.75 $\pm$ 1.64Ab	16.41 $\pm$ 0.39Aa