**Table S1** Characteristics of abiotic and biotic factors across five spatial scales. AGB, aboveground biomass of all woody individuals; BSAGB, aboveground biomass of big-sized trees; CVDBH, DBH variation; BSNCI, neighborhood competition intensity of big-sized trees; SR, species richness; PD, phylogenetic diversity; FDis, functional dispersion; CWMLPC, community-weighted mean of leaf phosphorus concentration; SoilPC1, soil nutrients. Different letter in each row represents difference significantly at *P*<0.05.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | 20m×20m | 20m×40m | 40m×40m | 60m×60m | 100m×100m |
| AGB | 280.08±88.9a | 280.08±66.65a | 280.08±51.55a | 280.22±40.08a | 280.08±30.26a |
| SR | 33±8e | 44±11d | 58±14c | 77±17b | 106±23a |
| PD | 3227.8±749.1c | 4046.32±912.71b | 4994.43±1082.06b | 6259.24±1225.46a | 8094.52±1496.94a |
| FDis | 1.34±0.16a | 1.01±0.23b | 1.01±0.22b | 1.1±0.2b | 1.01±0.18b |
| CWMLPC | 1.09±0.09a | 1.03±0.08b | 1.03±0.07b | 1.03±0.06b | 1.03±0.05b |
| BSNCI | 82.39±47.26e | 78.64±32.9d | 78.43±27.45c | 78.44±22.68b | 79.69±19.58a |
| BSAGB | 8.12±5.62a | 13.69±8.83a | 13.69±8.83a | 51.36±27.14a | 133.11±50.93a |
| CVDBH | 1.12±0.16a | 1.13±0.15a | 1.13±0.15a | 1.13±0.12a | 1.13±0.09a |
| SoilPC1 | 0.0001±0.32a | 0±1.74a | 0±1.74a | 0±2.04a | 0±2.16a |



**Figure S1** Principal component analysis of soil nutrients including soil pH, soil organic carbon, total nitrogen, total phosphorus, total potassium, hydrolysable nitrogen, available phosphorus, and available potassium across five spatial scales including (a) 0.04ha, (b) 0.08ha, (c)0.16ha, (d) 0.36ha, and (e) 1ha.



**Figure S2** Pearson correlations among different community-weighted mean (CWM) of traits including leaf area (LA), specific leaf area (SLA), leaf nitrogen concentration (TN), leaf phosphorus concentration (TP), and woody density (WD) across five spatial scales. a, 0.04ha; b, 0.08ha; c, 0.16ha; d, 0.36ha; e, 1ha.



**Figure S3** Pearson correlations among aboveground biomass of all woody individuals (AGB), species richness (SR), phylogenetic diversity (PD), functional dispersion (FDis), community-weighted mean of leaf total phosphorus concentration (CWMLPC), aboveground biomass of big-sized trees (BSAGB), neighborhood competition intensity of big-sized trees (BSNCI), stand structural complexity (CVDBH), and soil nutrients (SoilPC1) across five spatial scales including (a) 0.04ha, (b) 0.08ha, (c) 0.16ha, (d) 0.36ha, and (e) 1ha.