

Supplemental material for “Variations of arbuscular mycorrhizal colonization associated with root diameter and hypodermis passages cells across temperate and tropical woody species”

Table S1. Geographical information and soil characteristics of tropical and temperate forests.

	Tropical forest	Temperate forest
Longitude (N)	108°36'-109°05'	127°30'-127°34'
Latitude (E)	18°23'-18°50'	45°21'-45°25'
Altitude (m)	809	300
Mean annual temperature (°C)	23.2	2.8
Mean annual precipitation (mm)	2266	723
Vegetation type	Natural forest	Secondary forest
Soil type	Laterite soil	Haplic Luvisols
pH	6.32 ± 0.01	6.42 ± 0.23
Soil organic carbon (mg g ⁻¹)	29.38 ± 0.94	148.60 ± 9.81
Soil total nitrogen (mg g ⁻¹)	1.99 ± 0.02	7.62 ± 1.57
Soil total phosphorus (mg g ⁻¹)	0.15 ± 0.01	1.82 ± 0.17

Values in parentheses are standard errors.

Table S2. Root functional traits in 12 tropical species (mean±1 standard error, n=17-26).

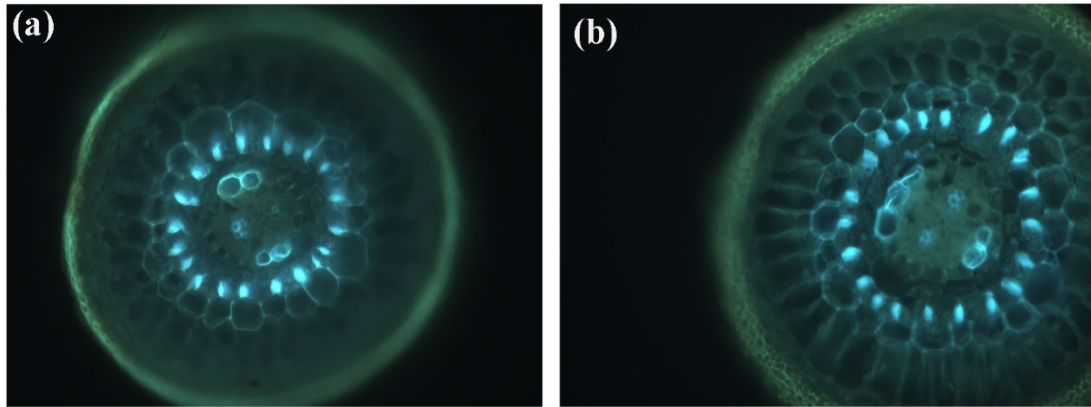
Species	Mycorrhizal colonization rate (%)	Cortex thickness (μm)	Number of passage cells (NO.)	Proportion of passage cell (%)	Number of passage cell colonized by fungi (NO.)	Proportion of passage cells colonized by fungi (%)	Root diameter (μm)
<i>Viburnum odoratissimum</i>	27.62±3.32c	224.15±4.63cd	12.12±0.66d	28.18±1.75a	2.59de	22.58±3.78bcd	689.65±14.53c
<i>Liquidambar formosana</i>	13.99±2.07e	200.59±10.49de	19.00±1.48c	27.03±2.08a	3.64cd	19.75±2.12bcd	529.45±36.83d
<i>Alangium chinense</i>	8.00±1.19fg	131.78±6.52fg	13.44±1.04d	21.80±1.14b	2.19e	17.61±1.8d	379.95±27.98f
<i>Eucommia ulmoides</i>	7.12±1.16fg	175.29±7.77e	12.78±0.66d	19.95±1.17bc	2.39de	19.62±2.91bcd	545.52±22.98d
<i>Cratogeomys cochinchinense</i>	21.04±3.27d	67.40±1.91i	5.90±0.43e	18.79±0.84c	1.70e	28.10±5.13abc	210.35±6.17i
<i>Alseodaphne hainanensis</i>	52.60±2.62a	466.36±22.90a	37.61±2.58a	24.92±1.22a	7.28a	20.96±2.55bcd	1313.10±42.68a
<i>Manglietia hainanensis</i>	34.96±2.06b	293.11±8.04b	31.91±1.96b	26.78±1.16a	5.09b	18.68±3.02cd	790.35±20.94b
<i>Sterculia lanceolata</i>	4.16±0.56g	90.09±2.94h	6.50±0.29e	21.07±0.77bc	1.79e	27.29±4.25abc	285.54±7.52gh
<i>Aporosa dioica</i>	20.78±1.51d	77.98±2.04hi	5.20±0.31e	20.53±0.92bc	1.76e	33.79±5.58a	235.49±6.59hi
<i>Acronychia pedunculata</i>	39.34±2.08b	113.57±4.18g	7.78±0.44e	20.38±1.05bc	1.70e	23.08±3.91bcd	301.58±11.18g
<i>Fortunella margarita</i>	38.97±3.82b	232.72±6.60c	19.59±1.08c	18.82±0.63bc	2.88de	14.40±2.69d	674.57±15.13c
<i>Aquilaria sinensis</i>	10.96±2.49ef	150.78±7.78f	14.84±0.81d	18.93±0.83bc	4.47bc	29.56±4.70ab	455.89±21.29e
Mean	23.30	185.32	15.56	22.27	3.12	22.95	534.29
CV(%)	69.4	60.5	47.3	16.6	55.1	24.64	43.3

Note: The sequence of 12 tree species was consistent with Table 1. Different lower letters represent the significant interspecific difference among different species.

Table S3 Root functional traits in 10 temperature species (mean±1 standard error, n=26-31).

Species	Mycorrhizal colonization rate (%)	Cortex thickness (μm)	Number of passage cells (NO.)	Proportion of passage cell (%)	Number of passage cells colonized by fungi (NO.)	Proportion of passage cells colonized by fungi (%)	Root diameter (μm)
<i>Viburnum opulus</i>	62.89±2.38a	178.13±4.32b	17.88±1.11a	29.10±1.14c	5.97b	33.51±3.86b	546.31±13.87a
<i>Lonicera maackii</i>	15.62±2.55cd	68.41±2.22fg	6.53±0.69e	17.02±1.24e	0.77d	12.78±2.44ef	204.52±6.58f
<i>Euonymus alatus</i>	15.12±1.46cd	84.77±1.85e	6.50±0.28e	21.65±0.78d	1.23cd	18.90±2.92cde	261.04±6.26d
<i>Fraxinus mandshurica</i>	12.10±1.95de	85.72±1.68e	9.00±0.36c	20.49±0.70d	1.87c	20.93±2.72cd	260.09±5.05d
<i>Syringa reticulata</i>	8.98±1.55e	65.42±1.01gh	6.13±0.31e	19.84±0.74d	1.43cd	25.81±4.23bc	195.39±3.50f
<i>Phellodendron amurense</i>	61.68±0.86a	217.33±5.54a	17.13±1.06a	20.38±1.05d	5.97b	33.54±2.91b	566.75±13.97a
<i>Acer mandshuricum</i>	30.18±1.63b	73.05±2.07f	6.40±0.26e	22.56±0.51d	1.27cd	18.91±3.13cde	228.67±5.47e
<i>Acer ginnala</i>	16.01±0.88cd	59.19±2.39h	6.97±0.36de	32.74±1.73b	0.73d	10.53±1.88f	193.73±6.21f
<i>Acer mono</i>	19.57±1.24c	106.40±4.93d	7.93±0.31cd	21.90±0.64d	1.37cd	16.39±2.40def	310.20±9.25c
<i>Schisandra chinensis</i>	66.27±1.37a	130.99±2.07c	14.93±0.48b	43.19±1.22a	13.60a	90.41±2.80a	400.36±4.66b
Mean	30.84	106.94	9.94	24.89	3.42	28.17	316.71
CV(%)	75.6	49.7	47.9	31.9	119.7	82.39	44.5

Note: The sequence of 10 tree species was consistent with Table 1. Different lower letters represent the significant interspecific difference among different species.

**Figure S1.** Cross-section of ectomycorrhizal root of *Betula platyphylla* (a,b).

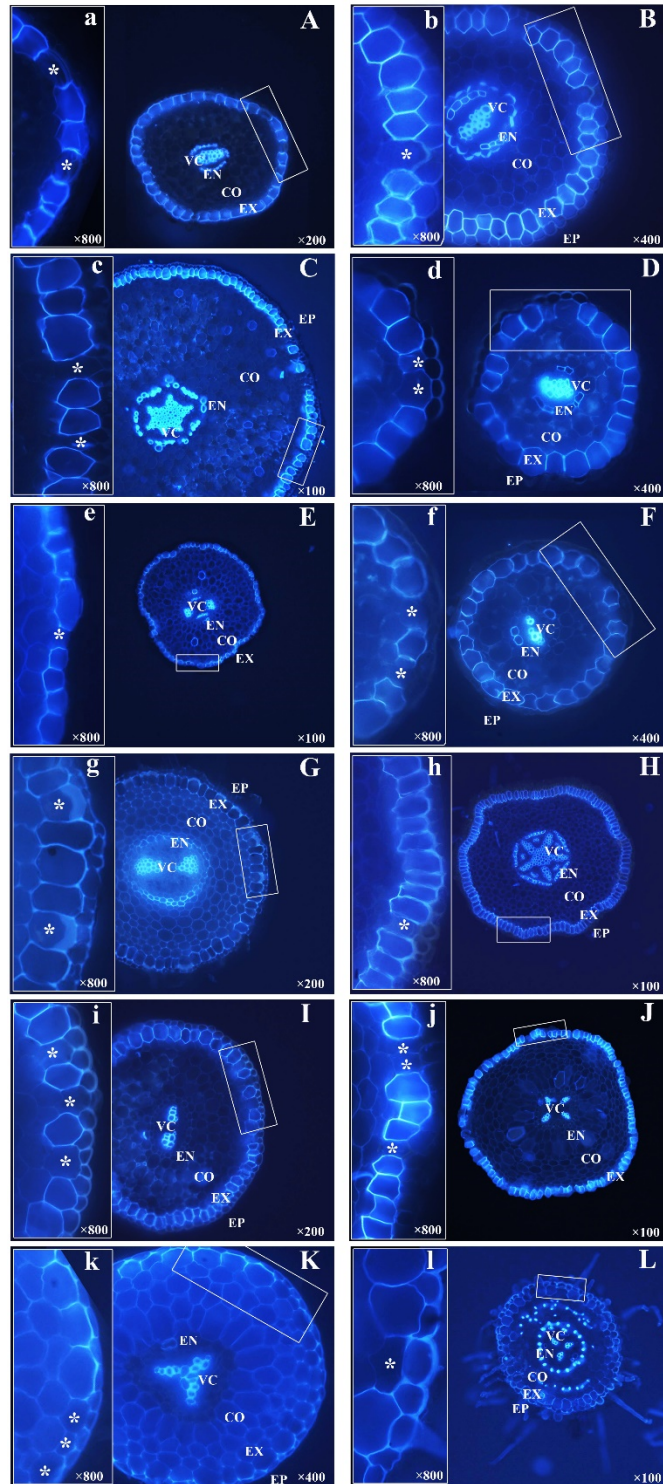


Table S2. Anatomical structures of the root tips of 12 Chinese tropical woody species. **A,a:** *Acronychia pedunculata*; **B,b:** *Alangium chinense*; **C,c:** *Alseodaphne hainanensis*; **D,d:** *Aporosa dioica*; **E,e:** *Aquilaria sinensis*; **F,f:** *Cratoxylum cochinchinense*; **G,g:** *Eucommia ulmoides*; **H,h:** *Fortunella margarita*; **I,i:** *Liquidambar formosana*; **J,j:** *Manglietia hainanensis*; **K,k:** *Sterculia lanceolata*; **L,l:** *Viburnum odoratissimum*. EP, epidermis; EX, exodermis; CO, cortex; VC, vascular cylinder (stele); EN, endodermis. Asterisk (*) indicates the passage cell.

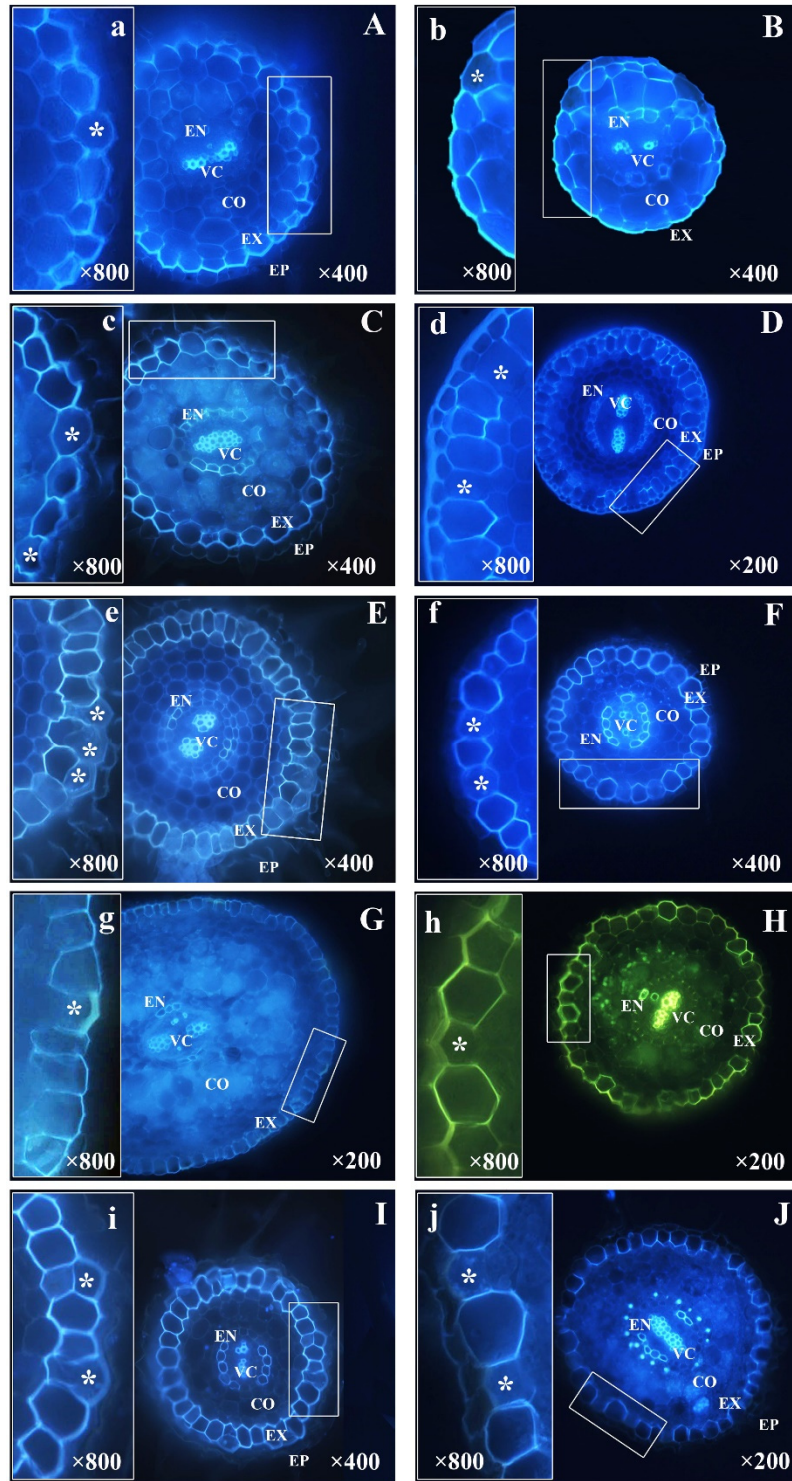


Figure S3. Anatomical structures of the root tips of 10 Chinese temperate woody species. **A,a:** *Acer mandshuricum*; **B,b:** *Acer ginnala*; **C,c:** *Acer mono*; **D,d:** *Euonymus alatus*; **E,e:** *Fraxinus mandshurica*; **F,f:** *Lonicera maackii*; **G,g:** *Phellodendron amurense*; **H,h:** *Schisandra chinensis*; **I,i:** *Syringa amurensis*; **J,j:** *Viburnum calvescens*. EP, epidermis; EX, exodermis; CO, cortex; EN, endodermis; VC, vascular cylinder (stele); Asterisk (*) indicates the passage cell.

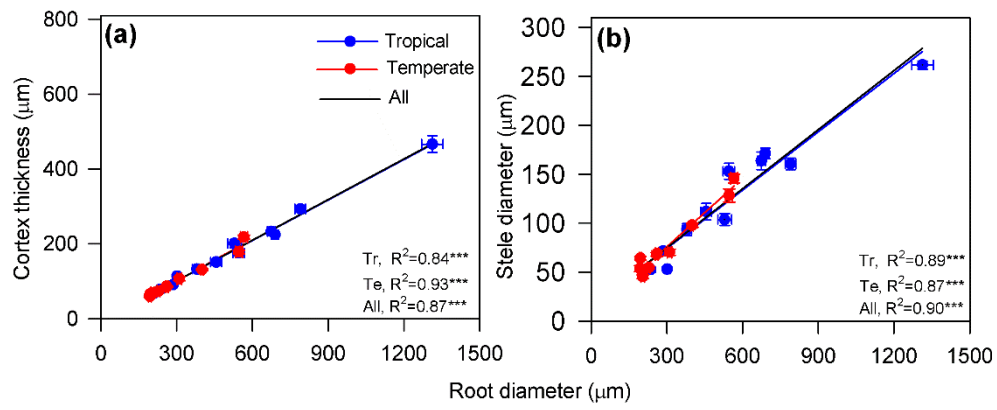


Figure S4. The relationship between root diameter and cortex thickness (a) and stele diameter (b). Tr, Te and All represent tropical, temperate and total species, respectively. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.