

Supplementary materials

Table S1. Soil physical and chemical properties under different nitrogen and phosphorus addition treatments

Treatment	pH	TC mg/g	TN mg/g	AN mg/g	NN mg/g	TP mg/g	AP mg/g
N ₀ P ₀	4.99±0.0200	2.463±0.0189	0.408±0.0696	0.01±0.0005	0.0009±0.00011	0.033±0.0017	0.044±0.0022
N ₀ P ₁	4.79±0.0115	1.906±0.0049	0.309±0.0349	0.009±0.0005	0.0027±0.00024	0.017±0.007	0.044±0.0012
N ₀ P ₂	5.19±0.0586	2.431±0.0051	0.418±0.0282	0.008±0.0003	0.0008±0.00008	0.319±0.2486	0.048±0.0034
N ₀ P ₃	5.230±0.0173	2.268±0.0134	0.322±0.0438	0.009±0.0005	0.0001±0.00004	0.046±0.0057	0.056±0.0056
N ₁ P ₀	4.817±0.0120	2.04±0.0118	0.345±0.0204	0.007±0.0002	0.0044±0.00003	0.224±0.1778	0.053±0.0047
N ₁ P ₁	4.747±0.0233	2.437±0.0540	0.473±0.0179	0.008±0.0001	0.0043±0.00317	0.048±0.0025	0.043±0.0009
N ₁ P ₂	4.773±0.012	2.175±0.3726	0.315±0.0609	0.007±0.0002	0.0005±0.00003	0.019±0.0083	0.054±0.0046
N ₁ P ₃	4.917±0.0088	2.091±0.1925	0.314±0.051	0.007±0.0003	0.0003±0.00002	0.05±0.0083	0.067±0.0111
N ₂ P ₀	4.167±0.0033	2.144±0.0415	0.35±0.0452	0.01±0.0004	0.0281±0.00041	0.039±0.0073	0.044±0.0009
N ₂ P ₁	4.073±0.0033	1.99±0.13470	0.382±0.0692	0.023±0.0002	0.0182±0.00015	0.011±0.0063	0.041±0.0037
N ₂ P ₂	4.117±0.0033	1.695±0.0744	0.319±0.0198	0.008±0.0002	0.0096±0.00006	0.012±0.0055	0.048±0.0020
N ₂ P ₃	4.047±0.0033	1.585±0.0389	0.307±0.0324	0.013±0.0002	0.0129±0.0001	0.029±0.0094	0.047±0.0011
N ₃ P ₀	3.950±0.0058	2.056±0.2687	0.442±0.0965	0.061±0.0011	0.0215±0.00015	0.039±0.0094	0.051±0.0067
N ₃ P ₁	3.957±0.0033	1.996±0.0126	0.436±0.0554	0.028±0.0004	0.0314±0.00016	0.061±0.0444	0.065±0.0066
N ₃ P ₂	3.917±0.0203	2.008±0.0064	0.47±0.012	0.052±0.0002	0.0297±0.00014	0.023±0.0102	0.049±0.0013
N ₃ P ₃	3.960±0.0100	2.279±0.0028	0.408±0.0457	0.079±0.0007	0.0287±0.00026	0.081±0.0125	0.046±0.0001

Note: TC: Total carbon; TN: Total nitrogen; AN: Ammonium nitrogen; NN: Nitrate nitrogen; TP: Total phosphorus; AP: Available phosphorus.

Table S2. Level of nitrogen and phosphorus addition

Treatment	Nitrogen addition concentration (g m ⁻² a ⁻¹)	NH ₄ Cl (g/ per pot)	Phosphorus addition concentration (g m ⁻² a ⁻¹)	NaH ₂ PO ₄ (g/ per pot)
N ₀ P ₀	0	0	0	0
N ₀ P ₁	0	0	0.6	0.070
N ₀ P ₂	0	0	2.4	0.280
N ₀ P ₃	0	0	4.2	0.490
N ₁ P ₀	3.6	0.414	0	0
N ₁ P ₁	3.6	0.414	0.6	0.070
N ₁ P ₂	3.6	0.414	2.4	0.280
N ₁ P ₃	3.6	0.414	4.2	0.490
N ₂ P ₀	14.4	1.657	0	0
N ₂ P ₁	14.4	1.657	0.6	0.070
N ₂ P ₂	14.4	1.657	2.4	0.280
N ₂ P ₃	14.4	1.657	4.2	0.490
N ₃ P ₀	25.2	2.900	0	0
N ₃ P ₁	25.2	2.900	0.6	0.070
N ₃ P ₂	25.2	2.900	2.4	0.280
N ₃ P ₃	25.2	2.900	4.2	0.490

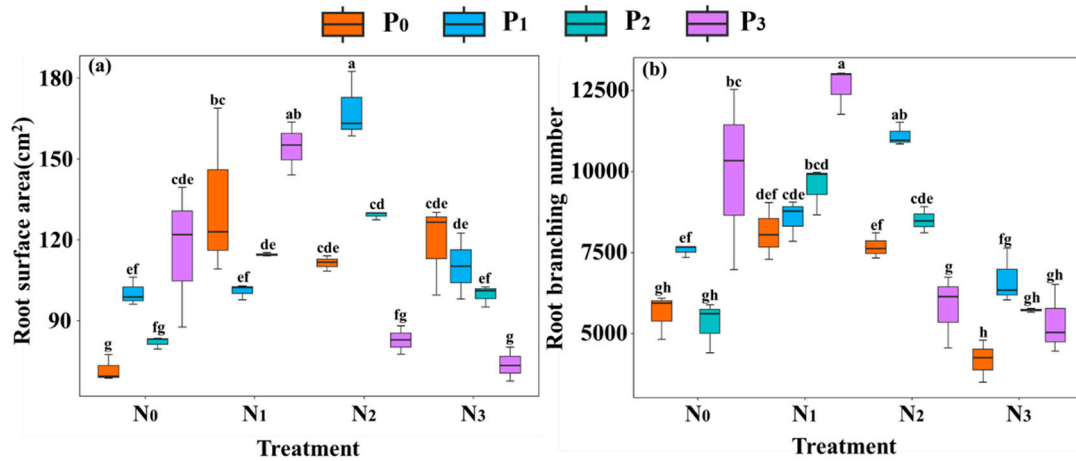


Figure S1. Effect of nitrogen and phosphorus addition on root traits of *Castanopsis kawakamii* seedlings

Notes: (a), (b) represent root branching number, root surface area, respectively. N₀P_i: single phosphorus addition treatment, N_iP₀: single nitrogen addition treatment, N₁P_i: low nitrogen and phosphorus interaction treatment, N₂P_i: medium nitrogen and phosphorus interaction treatment, N₃P_i: high nitrogen and phosphorus interaction treatment, where i=1,2,3. The differences represented by different lowercase letters between treatments with different nitrogen and phosphorus concentrations added are significant ($p < 0.05$). The same applies to the following.

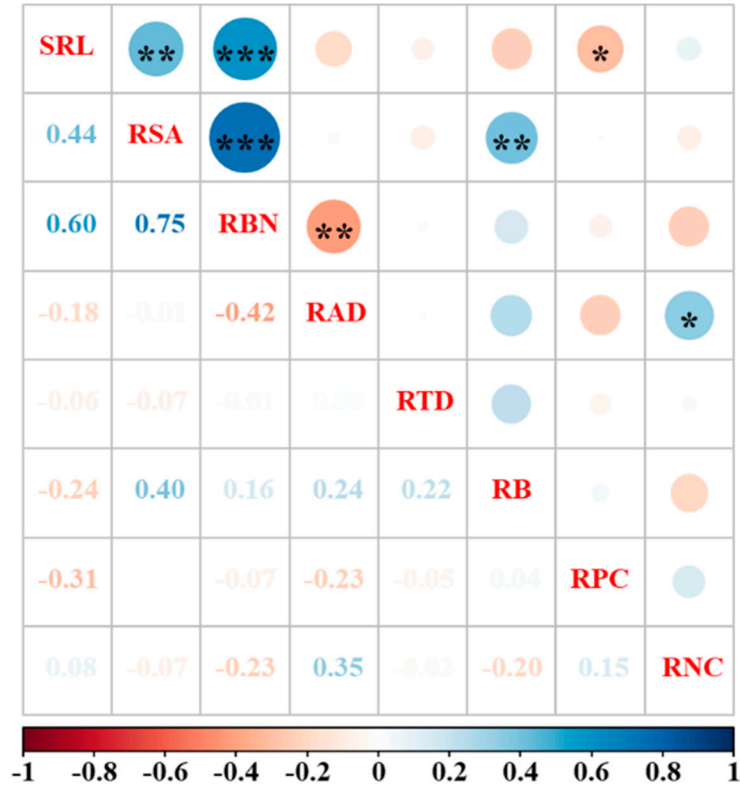


Figure S2. Correlation between root traits of *Castanopsis kawakamii* seedlings

Note: In the figure, SRL, RSA, RBN, RAD, RTD, RB, RPC, and RNC represent specific root length, root surface area, root branching number, root average diameter, root tissue density, root biomass, phosphorus content, and nitrogen content of the roots, respectively. The same applies to the following. In the figure, * denotes a significant correlation at the 0.05 level, ** denotes a highly significant correlation at the 0.01 level, and *** denotes a highly significant correlation at the 0.001 level.

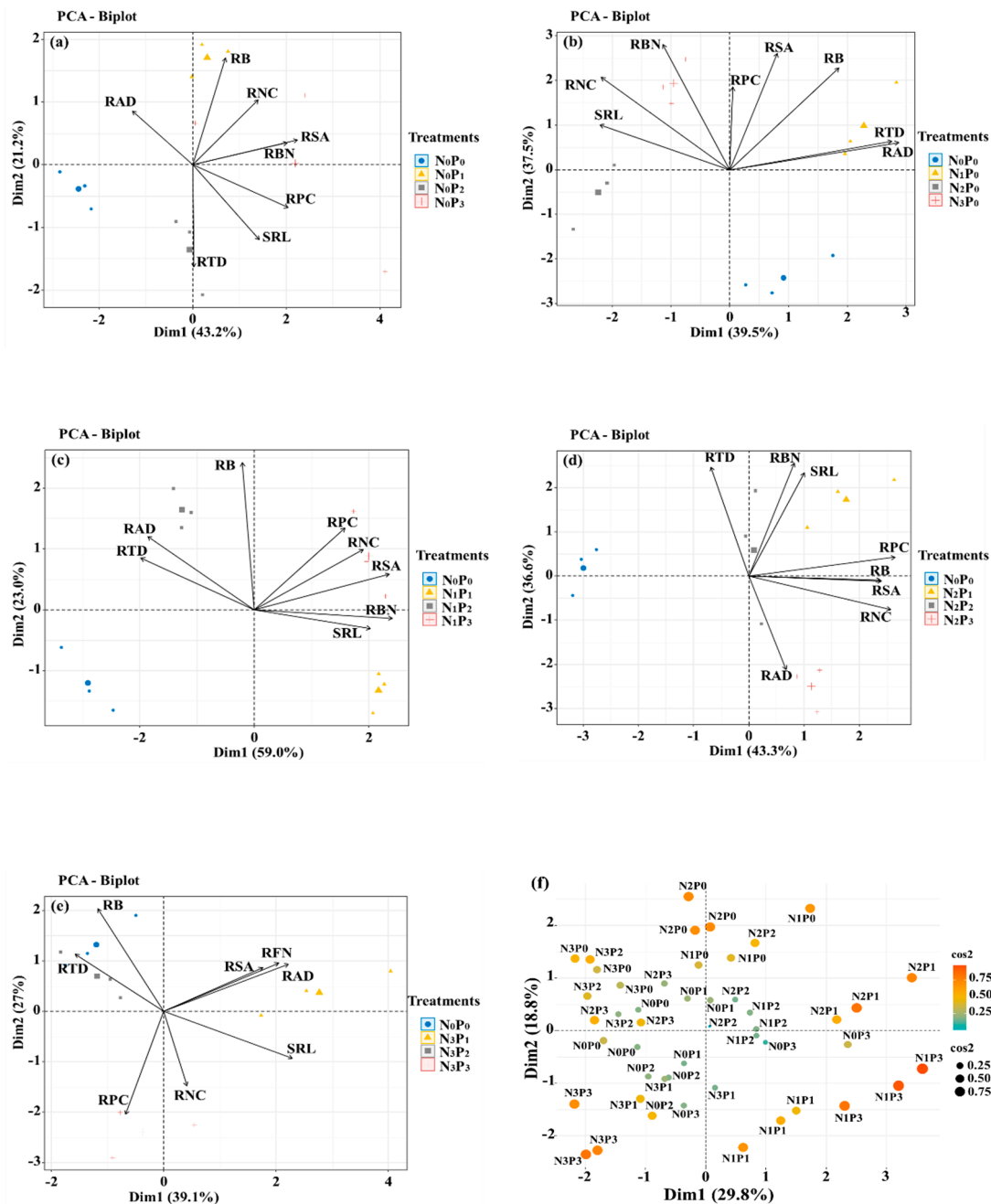


Figure S3. Principal component analysis (PCA) of root traits under different nitrogen and phosphorus addition treatments.

Note: NoP₀ is a non-nitrogen phosphorus addition treatment, (a): Single phosphorus addition treatment (NoP_i); (b): Single nitrogen addition treatment (N_iP₀); (c): Low nitrogen and phosphorus interactive addition treatment (N₁P_i); (d): Interactive addition of medium nitrogen and phosphorus (N₂P_i); (e): High nitrogen and phosphorus interactive addition treatment (N₃P_i), where, i=1, 2, 3; (f): Scatter contribution plot of

different nitrogen and phosphorus addition treatments. The \cos^2 value represents the contribution of the variable to the principal component.