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RESEARCH ARTICLE

Tree leaf functional trait diversity enhances rhizosphere phosphorus bioavailability in subtropical China

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SUPPLEMENTARY MATERIALS

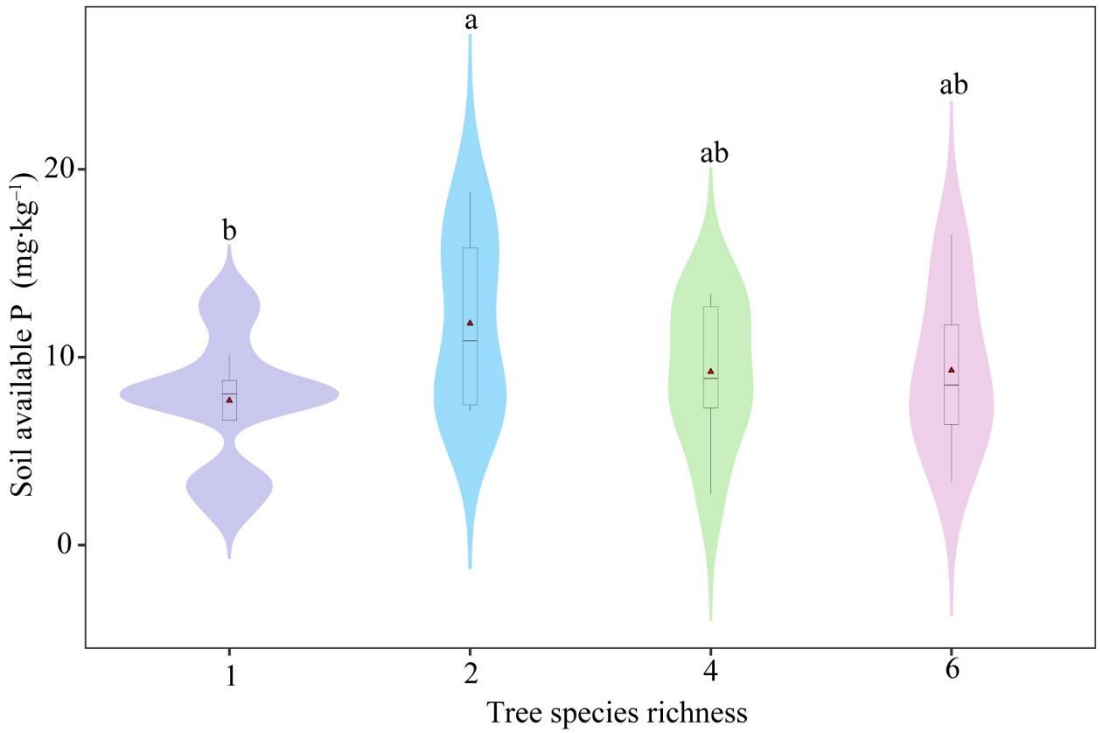

Fig. S1 Soil available phosphorus (P) across tree species richness levels.

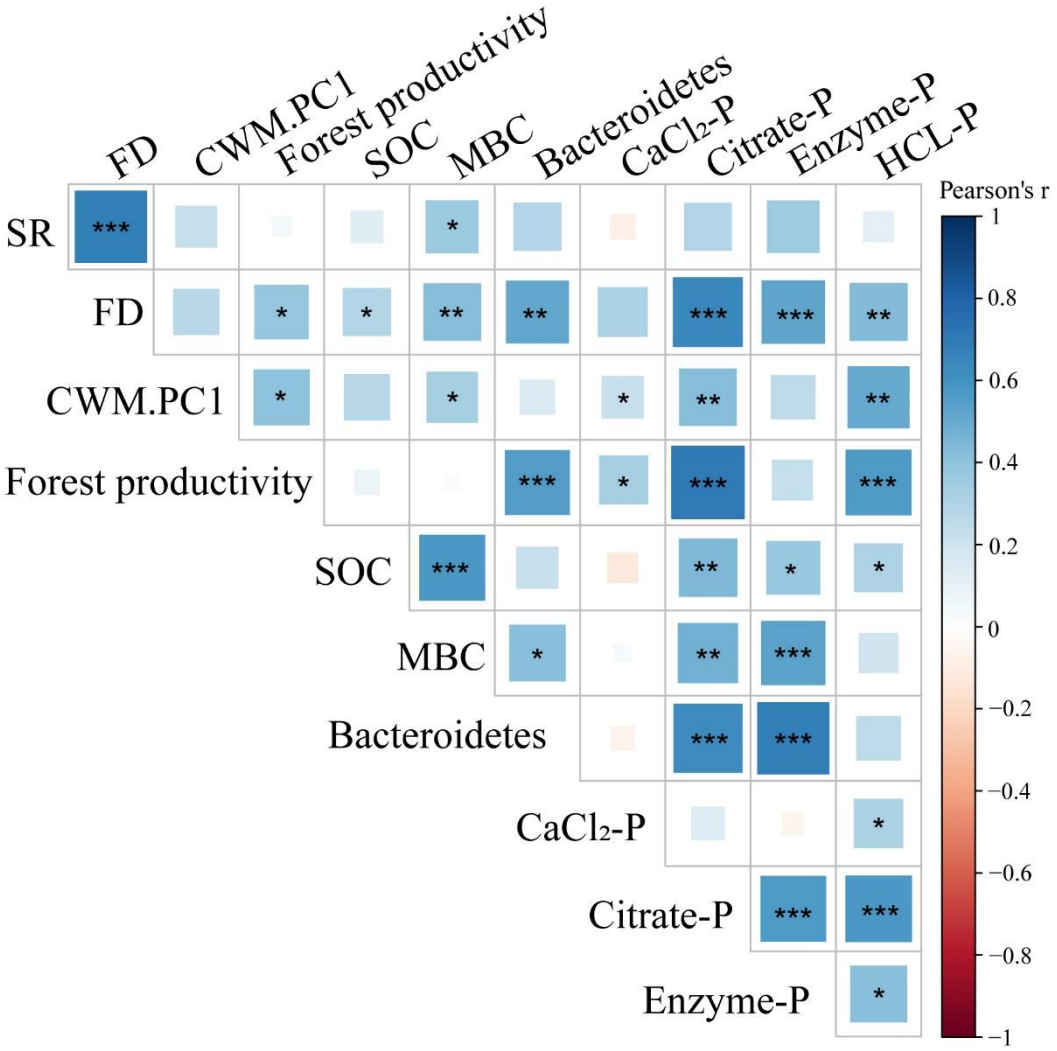

Fig. S2 Pearson's correlations between rhizosphere P bioavailability and predictors.

Table S1 List of the 8 planted tree species

Richness	Species combinations	Plots	Includes N-fixer
1	*Pinus massoniana* (P)	4	No
1	*Erythrophleum fordii* (E)	4	Yes
1	*Castanopsis hystrix* (C)	4	No
2	*Pinus massoniana* + *Castanopsis hystrix* (PC)	4	No
2	*Pinus massoniana* + *Erythrophleum fordii* (PE)	4	Yes
4	*Pinus massoniana* + *Castanopsis hystrix* + *Aquilaria sinensis* + *Michelia macclurei* (PCAM)	4	No
4	*Pinus massoniana* + *Erythrophleum fordii* + *Castanopsis hystrix* + *Dalbergia odorifera* (PECD)	4	Yes
6	*Pinus massoniana* + *Erythrophleum fordii* + *Castanopsis hystrix* + *Dalbergia odorifera* + *Michelia macclurei* + *Mytilaria laosensis* (PECDML)	4	Yes
6	*Pinus massoniana* + *Castanopsis hystrix* + *Aquilaria sinensis* + *Michelia macclurei* + *Mytilaria laosensis* + *Manglietia glauca* (PCAMLG)	4	No

Table S2 Allometric equations for tree biomass estimation

Species	Allometric equations	R^2
P. massoniana	$W = 0.023(D^2H)^{0.9955}$	0.990
E. fordii	$W = 0.018(D^2H)^{1.0656}$	0.998
C. hystrix	$W = 0.064(D^2H)^{0.8699}$	0.994
M. laosensis	$W = 0.174(D^2H)^{0.7661}$	0.920
D. odorifera	$W = 0.021(D^2H)^{0.9320}$	0.954
A. sinensis	$W = 0.089(D^2H)^{0.8430}$	0.966
M. macclurei	$W = 0.038(D^2H)^{0.9077}$	0.999
M. glauca	$W = 0.022(D^2H)^{1.0230}$	0.968

Table S3 Tests of normality and homoscedasticity for the linear mixed-effects model

Response variable	Predictor	Shapiro–Wilk test	Homoscedasticity test
$CaCl_2$-P	SR	0.813	
	FD	0.878	
	CWM.PC1	0.545	
	Forest productivity	0.530	
	SOC	0.890	
	MBC	0.809	
	Bacteroidetes	0.732	
Citrate-P	SR	0.672	
	FD	0.673	
	CWM.PC1	0.317	
	Forest productivity	0.171	
	SOC	0.872	
	MBC	0.664	
	Bacteroidetes	0.006	0.805
Enzyme-P	SR	0.247	
	FD	0.028	0.087
	CWM.PC1	0.024	0.282
	Forest productivity	0.001	0.468
	SOC	0.007	0.085
	MBC	0.023	0.056
	Bacteroidetes	0.557	
HCL-P	SR	0.930	
	FD	0.700	
	CWM.PC1	0.270	
	Forest productivity	0.802	
	SOC	0.594	
	MBC	0.965	
	Bacteroidetes	0.872	

Table S4 Results of pairwise PERMANOVA testing for differences in rhizosphere bacterial community composition across tree species richness levels

Tree species richness	*F*	R^2	*p*
Between 1 and 2	242.95	0.93	0.006
Between 1 and 4	796.07	0.98	0.006
Between 1 and 6	1148.42	0.99	0.006
Between 2 and 4	1174.23	0.99	0.006
Between 2 and 6	2892.03	0.99	0.012
Between 4 and 6	2605.76	0.99	0.006

Table S5 Summary of linear mixed-effects models

Response variable	Predictor	Estimate	SE	Random effects (Variance)	
				Species composition	Residual
$CaCl_2$-P	SR	–0.079	0.314	0.771	0.388
	FD	0.325	0.263	0.636	0.386
	CWM.PC1	0.535	0.216	0.849	0.323
	Forest productivity	0.373	0.126	0.750	0.297
	SOC	–0.0659	0.129	0.663	0.400
	MBC	0.041	0.127	0.672	0.400
	Bacteroidetes	0.060	0.150	0.700	0.396
Citrate-P	SR	0.291	0.259	0.444	0.576
	FD	0.774	0.191	0.234	0.430
	CWM.PC1	0.519	0.209	0.398	0.504
	Forest productivity	0.672	0.126	0.040	0.483
	SOC	0.380	0.139	0.365	0.493
	MBC	0.389	0.136	0.342	0.491
	Bacteroidetes	0.557	0.143	0.110	0.534
Enzyme-P	SR	0.358	0.224	0.273	0.673
	FD	0.558	0.186	0.157	0.615
	CWM.PC1	0.228	0.216	0.332	0.679
	Forest productivity	0.194	0.171	0.240	0.719
	SOC	0.286	0.156	0.242	0.670
	MBC	0.461	0.143	0.159	0.592
	Bacteroidetes	0.667	0.132	0.058	0.496
HCL-P	SR	0.118	0.306	0.709	0.431
	FD	0.690	0.260	0.644	0.352
	CWM.PC1	0.451	0.200	0.405	0.421
	Forest productivity	0.346	0.142	0.349	0.429
	SOC	0.266	0.127	0.584	0.391
	MBC	0.091	0.133	0.597	0.444
	Bacteroidetes	0.062	0.157	0.600	0.448