Supplementary materials

Methods of soil sampling and nutrient detection

After 3 years' N fertilization in August 2014, green leaves and fine roots (diameter < 2 mm) of *Castanopsis eyrei*, seven dominant subtropical saplings, shrubs and seedlings (*Cleyera japonica*, *Camellia cuspidate*, *Rhododendron ovatum*, *Eurya muricata*, *Cinnamomum japonicum*, *Cinnamomum. subavenium* and *Sarcandra glabra*) and *Woodwardia japonica* were sampled from three individuals in each plot and then mixed as a sample. All of the samples were dried at 65℃ for 48 h and then ground with a ball mill (NM200, Retsch, Haan, Germany) and screened through a 100 mesh sieve. Leaf and root concentrations were measured using an elemental analyser (2400 Series2 CHNS/O Elemental Analyzer, Perkin-Elmer, USA). After acid digestion of the samples, leaf and root P concentrations were measured using a flow injection analysis instrument (AutoAnanlyzer3, Bran+Lubbe City, Germany).

During plant leaf and root sampling, we collected soil samples at depths of 0-10 cm to detect soil nutrient availability. We set three subplots randomly within each plot and collected three subsamples for each subplot using a hand-held steel soil borer (3 cm in diameter). Then, the three subsamples were mixed together to form one sample per plot and transported to a laboratory and air dried naturally. Soil total N and P contents were detected following the same steps used for leaf and root samples. In this study, mass total N, mass total P and mass N:P were used. Soil pH was measured by dry soil in water suspension with a water:soil ratio of 1:2.5.

Table S1. Allometric equations for the aboveground biomass of different plant species in this study.

Species	Equations	a_1	a_2	b	r^2	*p*
W. japonica	$Y=X_1^{a1}*X_2^{a2}*10^b$	1.703	0.790	-3.418	0.92	<0.001
C. japonica	$Y=a_1*(BD^2*H)^b$	0.061		0.707	0.99	<0.001
C. cuspidate	$Y=a_1*(CV)^b$	0.001		0.829	0.94	<0.001
R. ovatum	$Y=a_1*(BD^2*H)+b$	0.004		0.831	0.97	<0.001
E. muricata	$Y=a_1*(BD^2*H)^b$	0.028		0.816	0.90	<0.001
C. japonicum	$Y=a_1*(CV)^b$	0.005		0.716	0.90	<0.001
C. subavenium	$Y=a_1*(CV)^b$	0.001		0.817	0.93	<0.001
S. glabra	$Y=a_1*(CV)+b$	0.0002		1.692	0.96	<0.001
C. eyrei (1)	$Y=a_1*(D^2*H)^b$	0.065		0.920	0.98	<0.001
Others (2)	$Y=a_1*(D^2*H)^b$	0.095		0.870	0.91	<0.001

Y: Aboveground biomass (g for shrubs; kg for trees/saplings); X_1 (cm): length of fern leaves; X_2 (cm): width of fern leaves; BD (basal diameter): diameter at 10 cm above the ground; H: height of plants (cm for shrubs/seedlings, m for trees/saplings); CV (cm^3): $3.14*[(\text{canopy length} + \text{canopy width})/2]^2*H$; D (cm): diameter at breast height (~1.3 m) of tree/saplings; (1) from Du *et al*. 1987; (2) from Zhang *et al*. 2007.

Fig.S1. Effects of N fertilization on soil nutrient content and pH. (a) Total N content per gram soil at the depth of 0-10 cm; (b) total P content per gram soil at the depth of 0-10 cm; and (c) soil pH at the depth of 0-10 cm. Numbers in these figures indicate the results of ANOVA.

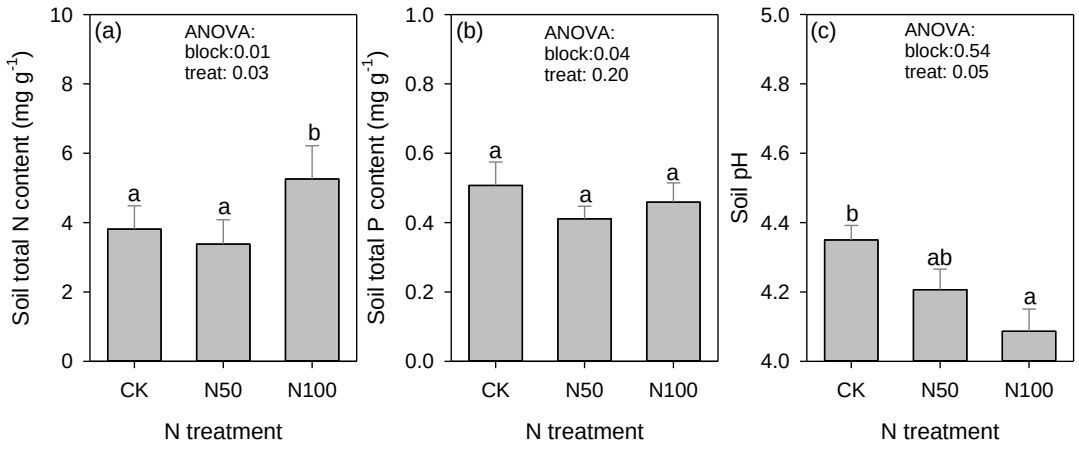

Fig.S2. Effects of N fertilization on foliar N and P concentration of three plant functional types. (a) Foliar N concentration; and (b) foliar P concentration. Numbers in these figures indicate the results of ANOVA.

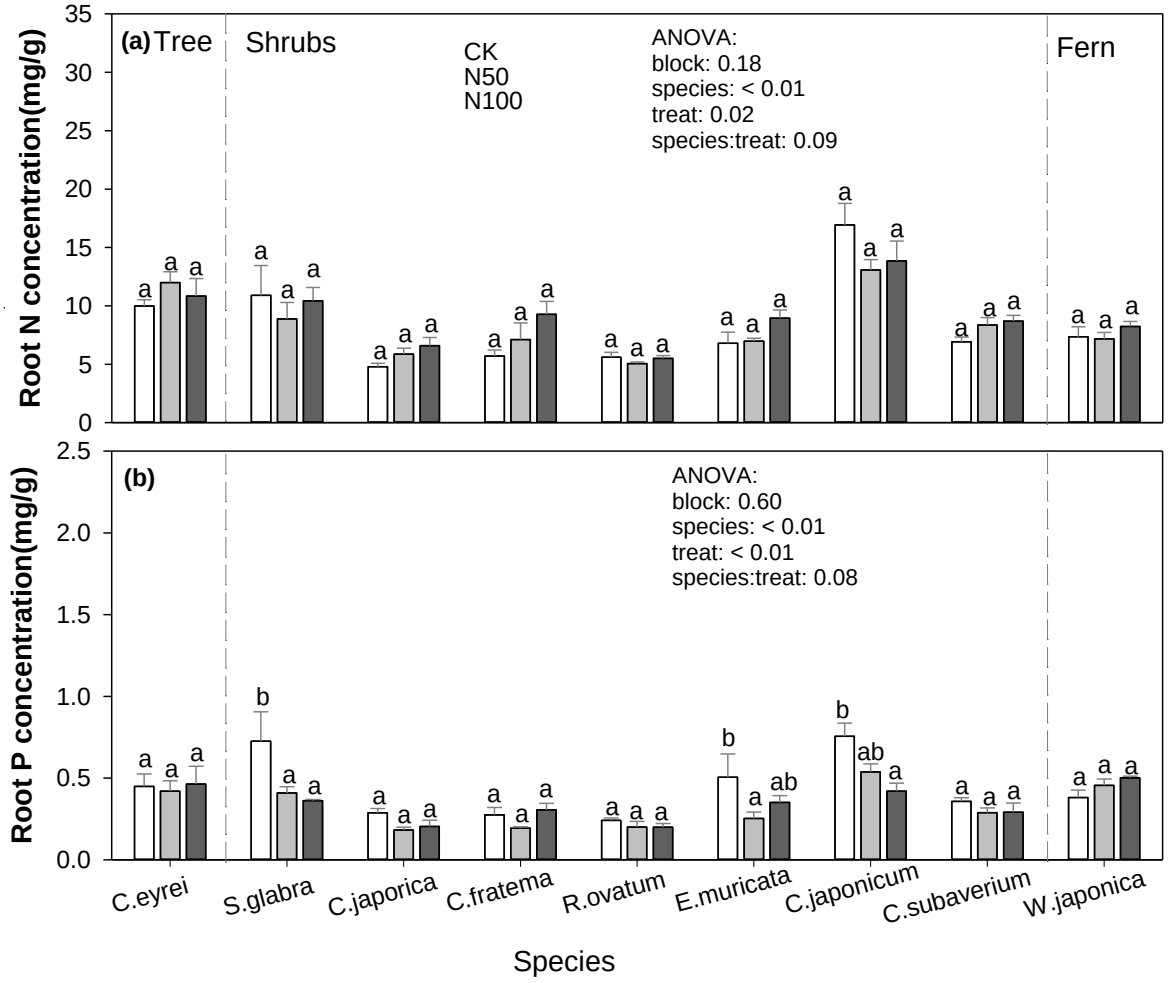

Fig.S3. Effects of N fertilization on the root nutrient concentration of three functional plant types. (a) Root N concentration; and (b) root P concentration. Numbers in these figures indicate the results of ANOVA.