

Stand feature associating with climate seasonality determinate root-shoot ratios of forest ecosystems in China

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Supporting information:

Table S1 Summary statistics of the environmental variables

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Variable, unit	Full case		Natural		Planted	
	Mean	range	Mean	range	Mean	range
Forest age, yr	42.9	3~317	65.2	3~255	30.9	3~317
Forest density, stocking /ha	1847	89~12200	1420	89~8782	2031	101~12200
BIO1, °C	12.3	-5.7~24.9	9.4	-5.7~23.5	13.8	-5.7~24.9
BIO2, °C	10.0	4.5~16.3	11.0	5.8~16.3	9.5	4.5~16.0
BIO3	30.1	20.0~53.0	33.3	20.0~53.0	29.6	20.0~52.0
BIO4, °C	58.6	10.0~100.0	56.0	10.0~100.0	59.6	10.0~99.9
BIO5, °C	27.8	10.2~35.1	25.1	10.2~35.1	29.2	11.3~34.4
BIO6, °C	-5.0	-37.3~15.4	-9.1	-37.3~15.2	-2.9	-37.1~15.4
BIO7, °C	32.8	15.8~60.6	34.1	16.6~59.8	32.1	15.8~60.6
BIO8, °C	20.1	3.9~28.5	18.0	3.9~28.5	21.1	5.4~28.5
BIO9, °C	2.0	-27.6~20.0	-1.5	-27.6~19.9	3.8	-27.4~20.0
BIO10, °C	22.0	4.4~29.0	19.1	4.4~28.7	23.5	5.6~29.0
BIO11, °C	1.3	-27.6~20.0	-1.9	-27.6~19.9	2.9	-27.4~20.0
BIO12, mm	1084.7	25.0~3354.0	891.5	25.0~3354.0	1183.1	26.0~2877.0
BIO13, mm	205.4	6.0~788.0	177.9	9.0~476.0	219.3	6.0~788.0
BIO14, mm	21.1	0~145.0	13.5	0~145.0	25.1	0~55.0
BIO15, mm	74.9	30.0~140.0	81.0	30.0~119.0	71.8	34.0~140.0
BIO16, mm	540.4	17.0~2024.0	467.8	18.0~1321.0	577.4	17.0~2024.0
BIO17, mm	77.01	0~472.0	49.4	0~472.0	91.1	0~199.0
BIO18, mm	479.0	16.0~2024.0	437.8	18.0~1195.0	500.0	16.0~2024.0
BIO19, mm	89.9	0~487.0	53.5	0~487.0	108.5	1.0~254.0
TN, g/100g	0.154	0.011~0.713	0.177	0.019~0.713	0.142	0.011~0.713
TP, g/100g	0.059	0.01~0.194	0.065	0.016~0.154	0.056	0.01~0.194
TK, g/100g	1.761	0.244~3.156	1.812	0.387~3.156	1.735	0.244~3.156
pH	6.23	4.19~8.63	6.43	4.69~8.63	6.13	4.19~8.63
SOM, g/100g	3.175	0.221~23.852	3.662	0.240~22.735	2.927	0.221~23.852
BD, g/cm ³	1.278	0.829~1.449	1.270	0.829~1.449	1.282	0.829~1.449
POR, cm ³ /100cm ³	51.48	43.29~59.78	51.52	43.29~59.78	51.46	43.29~59.78
SA, g/100g	32.74	5.02~87.12	35.70	12.27~87.12	31.23	5.02~87.12
SI, g/100g	42.72	7.95~61.95	42.81	7.95~61.95	42.68	7.95~60.51
CL, g/100g	24.53	4.93~49.86	21.49	4.93~49.86	26.08	4.93~49.86

Table S2 Direct and indirect effect size of variables on root-shoot ratios across forest ecosystems in China, where indirect effect only was considered via forest density as shown in the Fig 4. (Significance level, *, $p<0.05$; **, $p<0.01$; *, $p<0.001$)**

	Natural			Planted			Full		
	Direct	On density	Indirect	Direct	On density	Indirect	Direct	On density	Indirect
Forest age	-0.108*	-0.450***	-0.080***	-0.082*	-0.340***	-0.033**	-0.090**	-0.418***	-0.053***
Forest density	0.177***	-	-	0.096**	-	-	0.126***	-	-
BIO4	-0.094*	-0.019	-0.003	-0.015	0.032	0.003	-0.047*	0.008	0.001
BIO8	-0.092*	0.012	0.002	-0.099**	-0.007	-0.001	-0.113***	0.002	0.000
BIO15	0.165***	-0.080*	-0.014*	0.099*	-0.111**	-0.011*	0.113***	-0.120***	-0.015**
BIO18	-0.229***	-0.055	-0.010	-0.092**	-0.024	-0.002	-0.147***	-0.034	-0.004

Support information: Figures

Fig.S1 Frequency distributions of root-shoot ratio between various forest origins in China.

Fig.S2 Correlation analysis on variables of full dataset collected in forest ecosystems of China. Only significantly positive or negative correlations ($p < 0.05$) are displayed in blue and in red color, respectively; and color intensity and circle size are proportional to the correlation coefficients.

Fig.S3 Variable selection based on random forests for the shoot-root ratio data of full data in forest ecosystems of China. The top graphs illustrate the thresholding for removing negative importance variables based on VI mean and VI standard deviation; bottom left and bottom right graphs are associated with interpretation and prediction showing the number of selected variables based on OOB error, respectively.

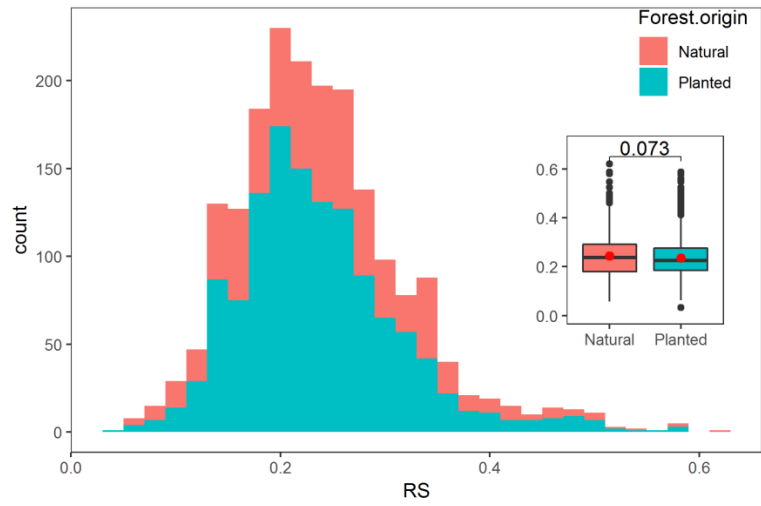


Fig. S1 Frequency distributions of root-shoot ratio between various forest origins in China

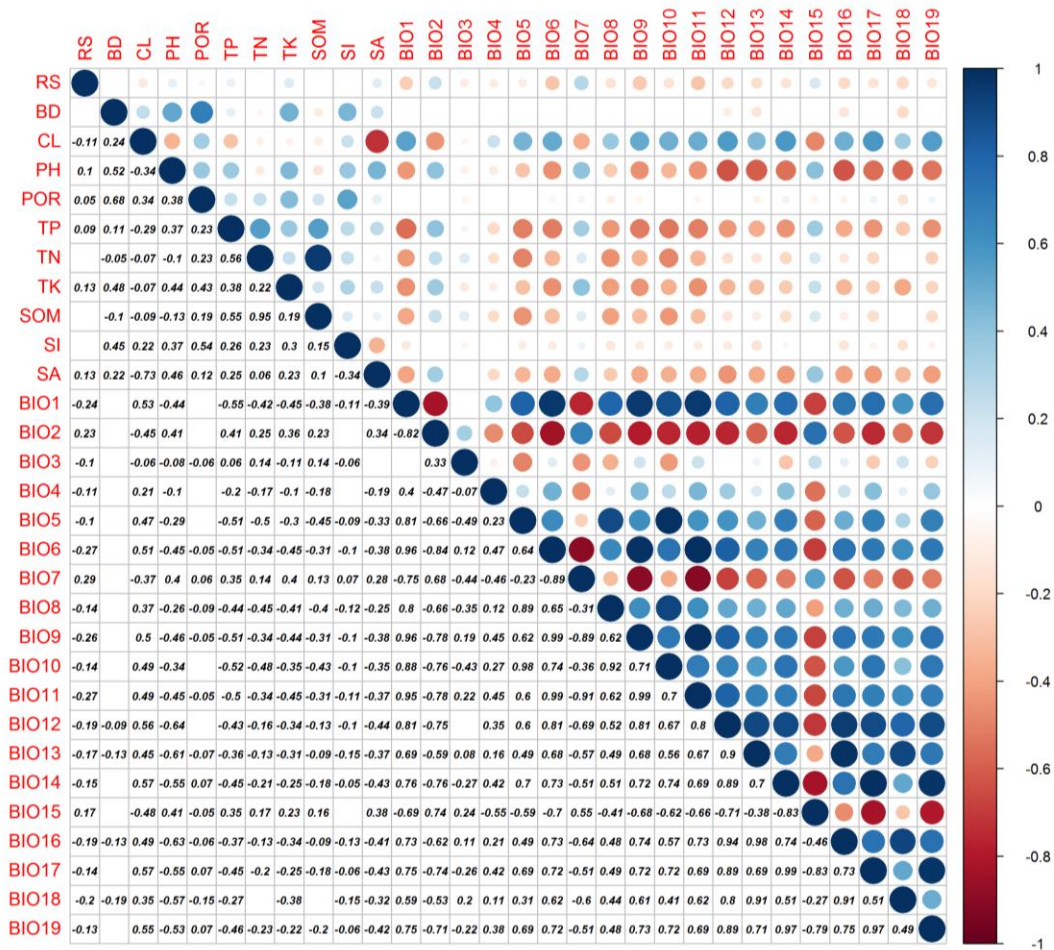


Fig.S2 Correlation analysis for root-shoot ratio (RS) and environmental variables of full dataset collected in forest ecosystem of China. Only significantly positive or negative correlations ($p < 0.05$) are displayed in blue and in red color, respectively; and color intensity and circle size are proportional to the correlation coefficients.

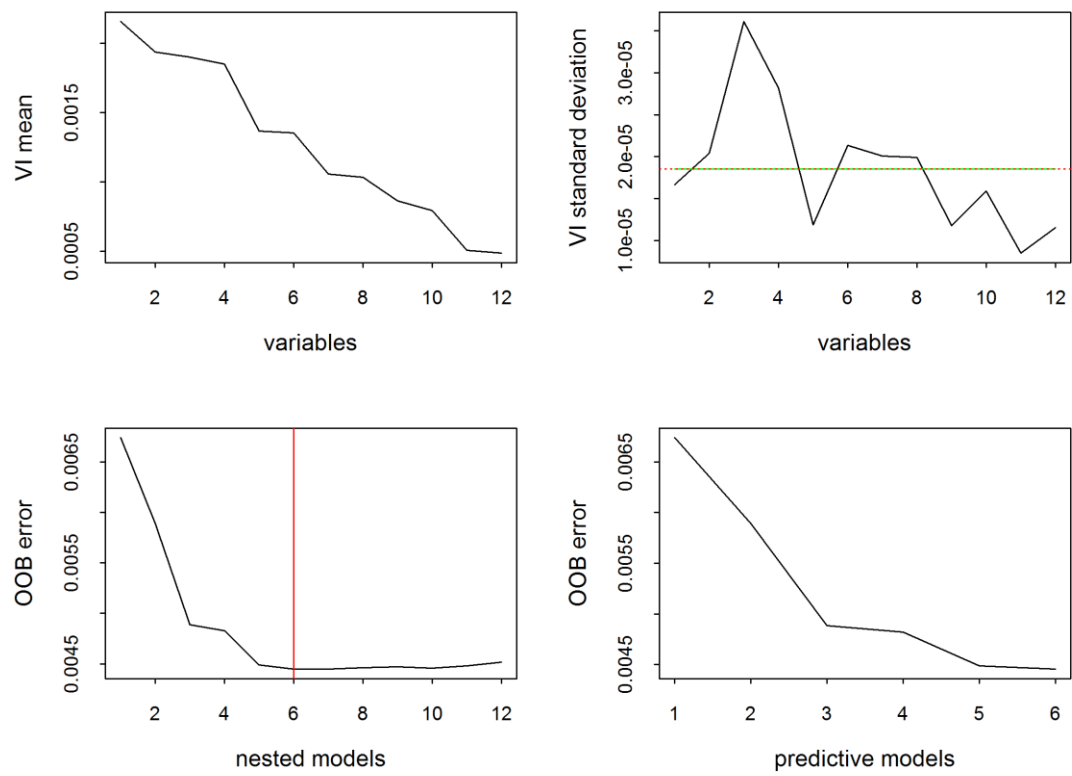


Fig. S3. Variable selection based on random forests for the shoot-root ratio data of full data in forest ecosystems of China. The top graphs illustrate the thresholding for removing negative importance variables based on VI mean and VI standard deviation; bottom left and bottom right graphs are associated with interpretation and prediction showing the number of selected variables based on OOB error, respectively.