Table S1. Soil microbial biomass carbon (MBC) and microbial biomass nitrogen (MBN) in different litter treatment and sampling season of three forest types

		MBC	MBN	MBC	MBN
		retain litter		remove litter	
Coniferous forest	FS	1022.97 ± 51.66^{Aa}	56.58 ± 2.69^{Aa}	869.72 ± 41.83^{Aa}	65.65 ± 4.69^{Aa}
	TS	194.26 ± 32.66^{Aa}	44.25 ± 3.38^{Ab}	289.94 ± 55.66^{Aa}	51.03 ± 6.42^{Ab}
	EGS	533.11 ± 66.35^{Aa}	23.88 ± 4.36^{Ba}	591.70 ± 55.59^{Aa}	27.88 ± 0.66^{Aab}
	LGS	681.37 ± 78.13^{Aa}	20.50 ± 2.06^{Aa}	813.50 ± 85.65^{Aa}	17.07 ± 0.72^{Aa}
	EFS	752.79 ± 101.10^{Aa}	5.88 ± 0.49^{Aa}	656.64 ± 80.53^{Aa}	4.63 ± 0.44^{Aa}
Mixed forest	FS	963.16 ± 158.28^{Aa}	47.91 ± 5.62^{Aa}	960.98 ± 98.33^{Aa}	40.85 ± 8.10^{Ab}
	TS	264.27 ± 39.20^{Aa}	63.35 ± 7.31^{Aa}	191.24 ± 42.43^{Aa}	61.79 ± 1.81^{Ab}
	EGS	432.93 ± 81.64^{Aa}	23.24 ± 4.24^{Aa}	455.78 ± 103.78^{Aa}	20.54 ± 4.03^{Ab}
	LGS	764.79 ± 137.76^{Aa}	26.01 ± 6.21^{Aa}	788.05 ± 58.40^{Aa}	29.82 ± 4.43^{Aa}
	EFS	916.17 ± 145.56^{Aa}	8.30 ± 2.33^{Aa}	744.38 ± 122.55^{Aa}	8.39 ± 2.30^{Aa}
Broad-leaved forest	FS	1285.15 ± 94.67^{Ba}	36.47 ± 11.11^{Aa}	1569.29 ± 405.69^{Aa}	21.78 ± 3.27^{Ab}
	TS	221.62 ± 41.81^{Aa}	73.43 ± 4.95^{Ba}	299.06 ± 44.97^{Aa}	82.49 ± 5.13^{Aa}
	EGS	596.46 ± 83.67^{Aa}	31.52 ± 1.27^{Aa}	521.23 ± 22.01^{Aa}	31.22 ± 2.31^{Aa}
	LGS	661.73 ± 444.98^{Aa}	23.82 ± 2.34^{Aa}	635.91 ± 102.77^{Aa}	16.45 ± 1.04^{Aa}
	EFS	775.74 ± 110.42^{Aa}	8.02 ± 1.27^{Aa}	820.63 ± 210.53^{Aa}	9.70 ± 1.04^{Aa}

Lowercase letters represent significant differences among different sampling seasons in the same litter treatment and forest type. Uppercase letters represent significant differences between different litter treatments in the same sampling season and forest type.

Table S2. Soil C:N, C:P, and N:P ratio in different sampling season of three forest types

		C:N	C:P	N:P	C:N	C:P	N:P
		retain litter			remove litter		
Coniferous forest	FS	15.34 ± 0.66^{ab}	54.56 ± 3.38^{b}	3.59 ± 0.38^{a}	16.43 ± 0.62^{a}	52.96 ± 3.33^{a}	3.22 ± 0.08^{a}
	TS	15.29 ± 0.59^{ab}	48.20 ± 4.07^{b}	3.18 ± 0.37^{a}	18.05 ± 1.10^{a}	57.32 ± 4.74^{a}	3.17 ± 0.10^{a}
	EGS	19.77 ± 1.98^{a}	75.32 ± 3.73^{a}	3.90 ± 0.50^{a}	19.40 ± 2.56^{a}	77.64 ± 11.05^{a}	4.13 ± 0.74^{a}
	LGS	12.80 ± 1.09^{b}	49.13 ± 1.49^{b}	3.92 ± 0.46^{a}	17.77 ± 0.51^{a}	62.85 ± 5.94^{a}	3.53 ± 0.30^{a}
	EFS	11.67 ± 0.83^{b}	48.33 ± 3.11^{b}	4.21 ± 0.51^{a}	17.79 ± 1.56^{a}	69.01 ± 3.78^{a}	3.94 ± 0.41^{a}
Mixed forest	FS	16.80 ± 1.47^{a}	47.24 ± 1.38^{a}	2.87 ± 0.32^{a}	19.37 ± 2.53^{a}	51.54 ± 1.61^{a}	2.72 ± 0.24^{a}
	TS	14.08 ± 0.51^{a}	41.47 ± 0.44^{a}	2.95 ± 0.11^{a}	17.31 ± 1.39^{a}	58.73 ± 2.44^{a}	3.44 ± 0.34^{a}
	EGS	11.99 ± 2.56^{a}	43.50 ± 1.30^{a}	3.97 ± 0.80^{a}	15.39 ± 1.03^{a}	57.61 ± 6.93^{a}	3.82 ± 0.63^{a}
	LGS	16.74 ± 0.56^{a}	54.59 ± 4.06^{a}	3.26 ± 0.20^{a}	15.29 ± 0.41^{a}	58.91 ± 6.77^{a}	3.85 ± 0.41^{a}
	EFS	13.60 ± 0.73^{a}	68.38 ± 11.21^{a}	5.00 ± 0.73^{a}	14.85 ± 1.91^{a}	55.54 ± 3.57^{a}	3.82 ± 0.35^{a}
Broad-leaved forest	FS	10.69 ± 1.14^{ab}	38.23 ± 2.35^{b}	3.67 ± 0.51^{a}	10.63 ± 0.34^{b}	37.17 ± 0.85^{b}	3.50 ± 0.08^{b}
	TS	14.99 ± 0.79^{a}	43.02 ± 2.89^{ab}	2.87 ± 0.08^{a}	11.12 ± 1.27^{b}	34.76 ± 1.35^{b}	3.19 ± 0.29^{b}
	EGS	8.66 ± 1.27^{b}	55.82 ± 3.55^{a}	6.64 ± 0.68^{a}	7.41 ± 1.35^{b}	46.36 ± 2.82^{b}	6.56 ± 0.92^{a}
	LGS	12.46 ± 1.05^{ab}	43.49 ± 3.78^{ab}	3.49 ± 0.10^{a}	17.75 ± 0.94^{a}	59.49 ± 2.72^{a}	3.36 ± 0.11^{b}
	EFS	10.58 ± 0.22^{ab}	46.00 ± 2.15^{ab}	4.35 ± 0.17^{a}	12.65 ± 0.15^{b}	49.72 ± 4.24^{b}	3.94 ± 0.38^{b}

Lowercase letters represent significant differences among different sampling seasons in the same litter treatment and same forest type.

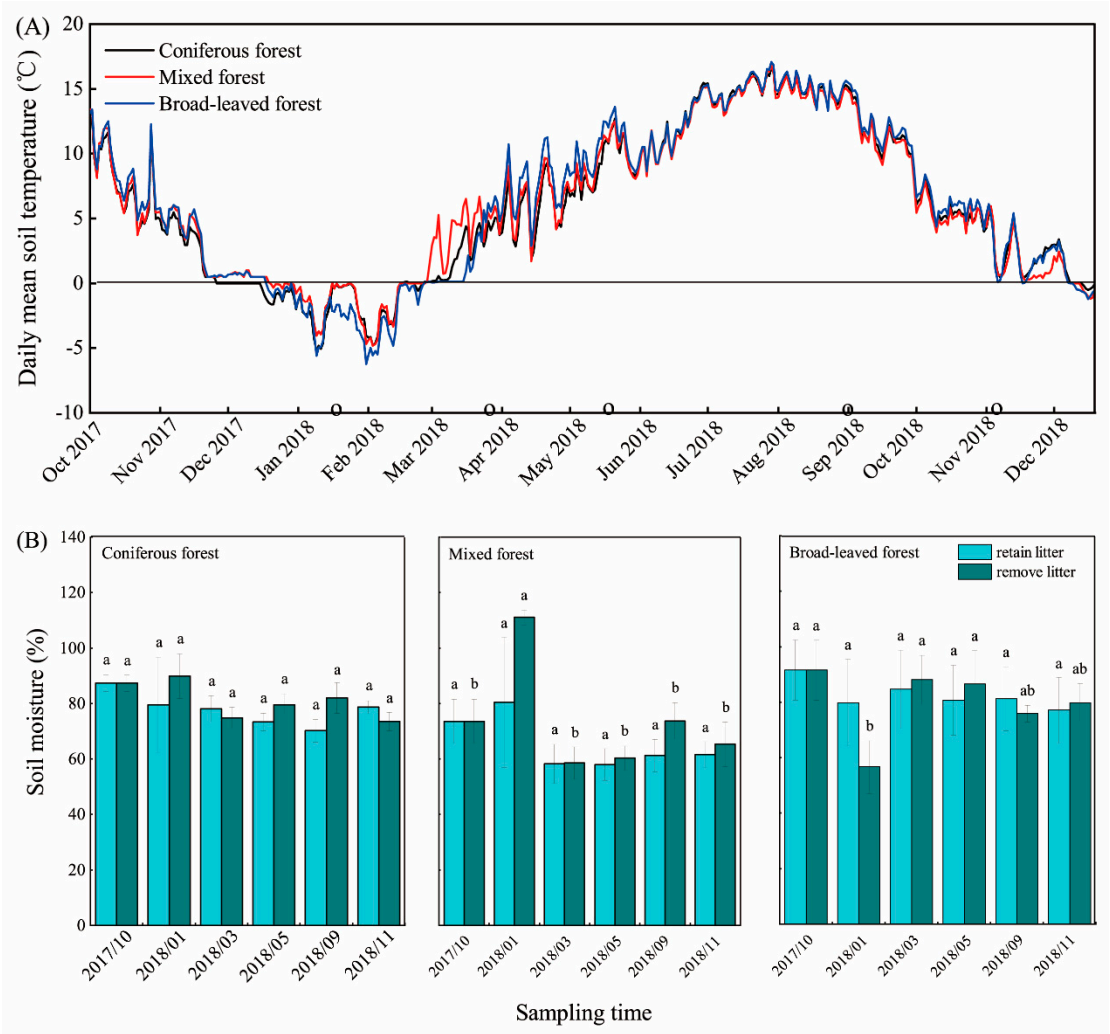
(A)
Daily mean soil temperature (℃)
Coniferous forest
Mixed forest
Broad-leaved forest
20
15
10
5
0
-5
-10
Oct 2017
Nov 2017
Dec 2017
Jan 2018
Feb 2018
Mar 2018
Apr 2018
May 2018
Jun 2018
Jul 2018
Aug 2018
Sep 2018
Oct 2018
Nov 2018
Dec 2018
(B)
Soil moisture (%)
Coniferous forest
Mixed forest
Broad-leaved forest
retain litter
remove litter
140
120
100
80
60
40
20
0
2017/10
2018/01
2018/03
2018/05
2018/09
2018/11
Sampling time

Figure S1. Soil temperature from Oct 2017 to Dec 2018 (A) and soil moisture was affected by litter treatment at different times in three forests (B). The circles indicate the sampling season. Values indicate means ± standard error, n = 3. The asterisks represent the significant differences between different litter treatments in the same sampling season. Lowercase letters represent significant differences among different sampling seasons in the same litter treatment.