

**Table S1.** The main and interactive effects of biochar application rate and time on soil organic carbon (SOC), soil labile organic carbon components, carbon pool activity (A) and carbon pool management index (CPMI) based on two-way ANOVAs ( $P < 0.05$ )

	Biochar application rate	Time	Biochar application rate $\times$ Time
SOC	$P < 0.001$	$P = 0.004$	$P = 0.068$
DOC/SOC	$P = 0.422$	$P < 0.001$	$P = 0.360$
MBC/SOC	$P = 0.495$	$P < 0.001$	$P = 0.312$
ROC/SOC	$P < 0.001$	$P = 0.001$	$P = 0.047$
A	$P < 0.001$	$P = 0.003$	$P = 0.037$
CPMI	$P = 0.025$	$P < 0.001$	$P < 0.001$

Note: DOC/SOC, the ratio of DOC to SOC; MBC/SOC, the ratio of MBC to SOC; ROC/SOC, the ratio of ROC to SOC.

**Table S2.** Effects of biochar applications on soil physiochemical properties

	Treatments	TN (g·kg <sup>-1</sup> )	AN (mg·kg <sup>-1</sup> )	Olsen-P (mg·kg <sup>-1</sup> )	pH	SM (%)
8 months	Control	0.91±0.06Ba	70.82±5.66Bb	16.60±0.53Bb	7.76±0.12Ba	9.90±0.23Ba
	LB	0.89±0.04Ca	68.13±2.05Cb	11.67±0.38Bc	7.68±0.03Ca	9.40±0.41Bab
	MB	1.02±0.12Ba	74.55±5.63Bb	17.70±0.20Bb	7.67±0.03Ca	9.06±0.21Bbc
	HB	1.02±0.14Ba	85.77±3.96Ca	28.27±2.68Ba	7.62±0.08Ca	8.53±0.76Bc
12 months	Control	1.04±0.05Ac	59.85±2.19Cc	9.93±0.75Cbc	7.83±0.08Ba	17.43±1.66Aa
	LB	1.24±0.05Ab	82.83±9.06Bb	8.50±0.90Bc	7.88±0.04Ba	17.62±0.61Aa
	MB	1.38±0.12Ab	86.80±4.71Bb	12.83±0.85Bb	7.89±0.04Ba	17.44±1.22Aa
	HB	1.54±0.12Aa	104.18±3.74Ba	16.80±0.92Ca	7.85±0.04Ba	18.93±1.40Aa
24months	Control	1.10±0.03Ac	95.40±3.19Ac	21.90±2.00Ab	8.17±0.01Aa	17.71±1.87Aa
	LB	1.13±0.05Bc	99.65±7.57Ac	20.03±6.34Ab	8.17±0.02Aa	17.66±0.92Aa
	MB	1.24±0.05Ab	121.61±9.25Ab	27.37±4.31Aab	8.08±0.01Ab	18.71±1.03Aa
	HB	1.35±0.05Aa	135.54±7.24Aa	35.20±3.10Aa	8.02±0.02Ac	19.54±1.03Aa

Note: TN, total nitrogen; AN, c available nitrogen; Olsen-P, available phosphorus; SM, Soil moisture. Different uppercase letters indicate significant differences of the same treatments between different time ( $P<0.05$ ); Different lowercase letters in the same column indicate significant differences between treatments ( $P<0.05$ ).

Figure S1 Change of the relative abundance of bacterial community under different biochar application on time scales.

