

Table S1. Characteristics of vegetation during different successional stages in June.

Stages	Density (m ⁻²)	Coverage (%)	R	H	Biomass (g m ⁻²)	Litter (g m ⁻²)
TAW	60.1 ± 7.5	85.6 ± 7.2	7	1.05	1252.3 ± 81.3	211.5 ± 18.5
PAW	70.3 ± 11.4	75.2 ± 6.5	8	1.16	954.6 ± 71.2	71.2 ± 12.3
PAD	53.1 ± 7.1	73.2 ± 5.5	8	1.22	824.5 ± 51.3	68.5 ± 9.1
PA + PAL	48.5 ± 6.2	71.2 ± 4.9	9	1.36	645.1 ± 44.4	54.1 ± 8.5
PAL	40.3 ± 5.1	62.4 ± 5.3	5	0.81	491.6 ± 42.6	40.5 ± 6.8

Note: TOC, total organic carbon; TN, total nitrogen; TP, total phosphorus; C: N, TOC: TN ratio; C: P, TOC: TP ratio; N: P ratio, TN: TP ratio; H, Shannon-Wiener Diversity Index; R, richness index. Values were means ± SE (*n* = 9). TAW, *T. augustifolia* wetland; PAW, *P. australis* wetland; PAD, *P. australis* dry land; PA+PAL, mixed grassland with *P. australis* and *P. arundinacea* L.; PAL, *P. arundinacea* L. grassland.

Table S2. Characteristics of vegetation during different successional stages in October.

Stages	Density	Coverage	R	H	Biomass (g m ⁻²)	Litter (g m ⁻²)
TAW	232.6 ± 21.1	87.9 ± 8.6	6	1.01	1549.3 ± 175.2	265.6 ± 23.4
PAW	298.6 ± 24.3	91.2 ± 8.9	6	1.08	1120.4 ± 122.6	103.1 ± 11.5
PAD	154.7 ± 18.5	85.4 ± 5.5	7	1.18	910.5 ± 95.6	85.6 ± 9.8
PA+PAL	205.6 ± 24.1	82.6 ± 5.1	10	1.31	874.6 ± 84.9	81.1 ± 8.7
PAL	132.5 ± 19.4	78.6 ± 4.4	5	0.78	866.8 ± 75.4	77.4 ± 8.2

Note: TOC, total organic carbon; TN, total nitrogen; TP, total phosphorus; C: N, TOC: TN ratio; C: P, TOC: TP ratio; N: P ratio, TN: TP ratio; H, Shannon-Wiener Diversity Index; R, richness index. Values are Means ± SE (*n* = 9). TAW, *T. augustifolia* wetland; PAW, *P. australis* wetland; PAD, *P. australis* dry land; PA+PAL, mixed grassland with *P. australis* and *P. arundinacea* L.; PAL, *P. arundinacea* L. grassland.

Table S3. Summary statistics (F statistic and probability level) of a one-way ANOVA on the effects of different succession stages on litter chemical properties in June and October.

	June		October	
	F	<i>p</i>	F	<i>p</i>
Litter TOC	24.4	<0.01	22.9	<0.01
Litter TN	27.4	<0.01	69.2	<0.01
Litter TP	57.1	<0.01	68.1	<0.01
Litter C: N	16.8	<0.01	51.8	<0.01
Litter C: P	23.4	<0.01	11.5	<0.01
Litter N: P	1.98	0.12	15.6	<0.01

Note: TOC, total organic carbon; TN, total nitrogen; TP, total phosphorus; C: N, TOC: TN ratio; C: P, TOC: TP ratio; N: P ratio, TN: TP ratio.

Table S4. Chemical properties of litters in different stages of wetland drying process in June.

	TOC	TN	TP	C: N	C: P	N: P
TAW	276.1 ± 22.5 ^b	9.81 ± 0.91 ^b	1.05 ± 0.091 ^{b,c}	28.1 ± 2.52 ^d	264.0 ± 22.4 ^c	9.38 ± 0.85 ^a
PAW	361.6 ± 30.2 ^a	12.2 ± 1.11 ^a	1.28 ± 0.013 ^a	29.7 ± 2.71 ^{c,d}	282.9 ± 25.6 ^c	9.57 ± 0.91 ^a
PAD	347.7 ± 29.8 ^a	10.1 ± 0.95 ^b	1.07 ± 0.095 ^b	34.7 ± 3.12 ^{b,c}	320.4 ± 28.5 ^b	9.35 ± 0.88 ^a
PA+PAL	362.3 ± 32.3 ^a	9.20 ± 0.88 ^{b,c}	1.04 ± 0.096 ^{b,c}	39.6 ± 3.33 ^{a,b}	348.7 ± 30.5 ^{a,b}	8.86 ± 0.82 ^a
PAL	357.7 ± 31.3 ^a	8.70 ± 0.83 ^c	0.98 ± 0.087 ^c	41.1 ± 3.55 ^a	360.2 ± 32.6 ^a	8.77 ± 0.78 ^a

Note: TOC, total organic carbon; TN, total nitrogen; TP, total phosphorus; C: N, TOC: TN ratio; C: P, TOC: TP ratio; N: P ratio, TN: TP ratio. Values are Mean ± SE (*n* = 9). Different letters indicate statistically significant differences between different stages. TAW, *T. augustifolia* wetland; PAW, *P. australis* wetland; PAD, *P. australis* dry land; PA+PAL, mixed grassland with *P. australis* and *P. arundinacea* L.; PAL, *P. arundinacea* L. grassland.

Table S5. Chemical properties of litters in different stages of wetland drying process in October.

	TOC	TN	TP	C: N	C: P	N: P
TAW	296.6 ± 25.6 ^b	9.26 ± 0.87 ^b	0.97 ± 0.088 ^{b,c}	32.9 ± 2.85 ^c	308.5 ± 28.5 ^c	9.37 ± 0.91 ^{b,c}
PAW	375.3 ± 32.3 ^a	13.1 ± 1.12 ^a	1.20 ± 0.101 ^a	28.8 ± 2.41 ^d	314.0 ± 28.4 ^c	10.9 ± 0.99 ^a
PAD	360.9 ± 29.5 ^a	10.9 ± 0.91 ^b	1.13 ± 0.095 ^{b,c}	33.0 ± 2.93 ^c	321.9 ± 29.6 ^{b,c}	9.77 ± 0.95 ^b
PA+PAL	371.0 ± 33.2 ^a	9.72 ± 0.87 ^{b,c}	1.08 ± 0.099 ^b	38.1 ± 3.42 ^b	342.3 ± 31.2 ^{a,b}	9.00 ± 0.85 ^c
PAL	366.6 ± 30.5 ^a	9.11 ± 0.83 ^c	1.00 ± 0.092 ^c	40.5 ± 3.62 ^a	364.6 ± 32.4 ^a	9.00 ± 0.81 ^c

Note: TOC, total organic carbon; TN, total nitrogen; TP, total phosphorus; C: N, TOC: TN ratio; C: P, TOC: TP ratio; N: P ratio, TN: TP ratio. Values are Mean ± SE ($n = 9$). Different letters indicate statistically significant differences between different stages. TAW, *T. augustifolia* wetland; PAW, *P. australis* wetland; PAD, *P. australis* dry land; PA+PAL, mixed grassland with *P. australis* and *P. arundinacea* L.; PAL, *P. arundinacea* L. grassland.

Table S6. Summary statistics (F statistic and probability level) of a one-way ANOVA on the effects of different succession stages on soil physical and chemical properties in June and October.

	June		October	
	F	p	F	p
SWC	369.4	<0.01	88.1	<0.01
BD	64.8	<0.01	79.9	<0.01
pH	3.74	0.02	3.12	0.03
Clay	32.8	<0.01	10.5	<0.01
Silt	18.7	<0.01	22.3	<0.01
Sand	49.9	<0.01	12.1	<0.01
SOC	221.9	<0.01	230.7	<0.01
TN	259.4	<0.01	135.8	<0.01
TP	139.2	<0.01	29.6	<0.01
AN	201.3	<0.01	89.1	<0.01
NN	128.9	<0.01	37.4	<0.01
C: N	42.7	<0.01	76.5	<0.01
C: P	92.8	<0.01	44.5	<0.01
N: P	48.7	<0.01	6.05	<0.01

Note: SWC, soil water content; BD, soil bulk density; Clay, soil clay content; Silt, soil silt content; Sand, soil sand content; SOC, soil organic carbon; TN, total nitrogen content; AN, ammonium nitrogen content; NN, nitrate nitrogen content; TP, soil total phosphorus content; CN, soil C: N ratio; CP, soil C: P ratio; NP, soil N: P ratio.

Table S7. Summary statistics (F statistic and probability level) of a one-way ANOVA on the effects of different succession stages soil microbial properties in June and October.

	June		October	
	F	p	F	p
MBC	306.9	<0.01	573.2	<0.01
MBN	524.1	<0.01	304.6	<0.01
MBC: SOC	35.2	<0.01	25.5	<0.01
BR	131.6	<0.01	53.2	<0.01
qCO ₂	80.5	<0.01	80.5	<0.01
Bac	485.8	<0.01	419.2	<0.01
Fun	132.6	<0.01	113.1	<0.01
FBR	195.7	<0.01	65.4	<0.01

Note: MBC, microbial biomass carbon; MBN, microbial biomass nitrogen; BR, basal respiration; qCO₂, microbial metabolic quotient; Bac, bacteria abundance; fun, fungi abundance; FBR, fungi: bacteria ratio.

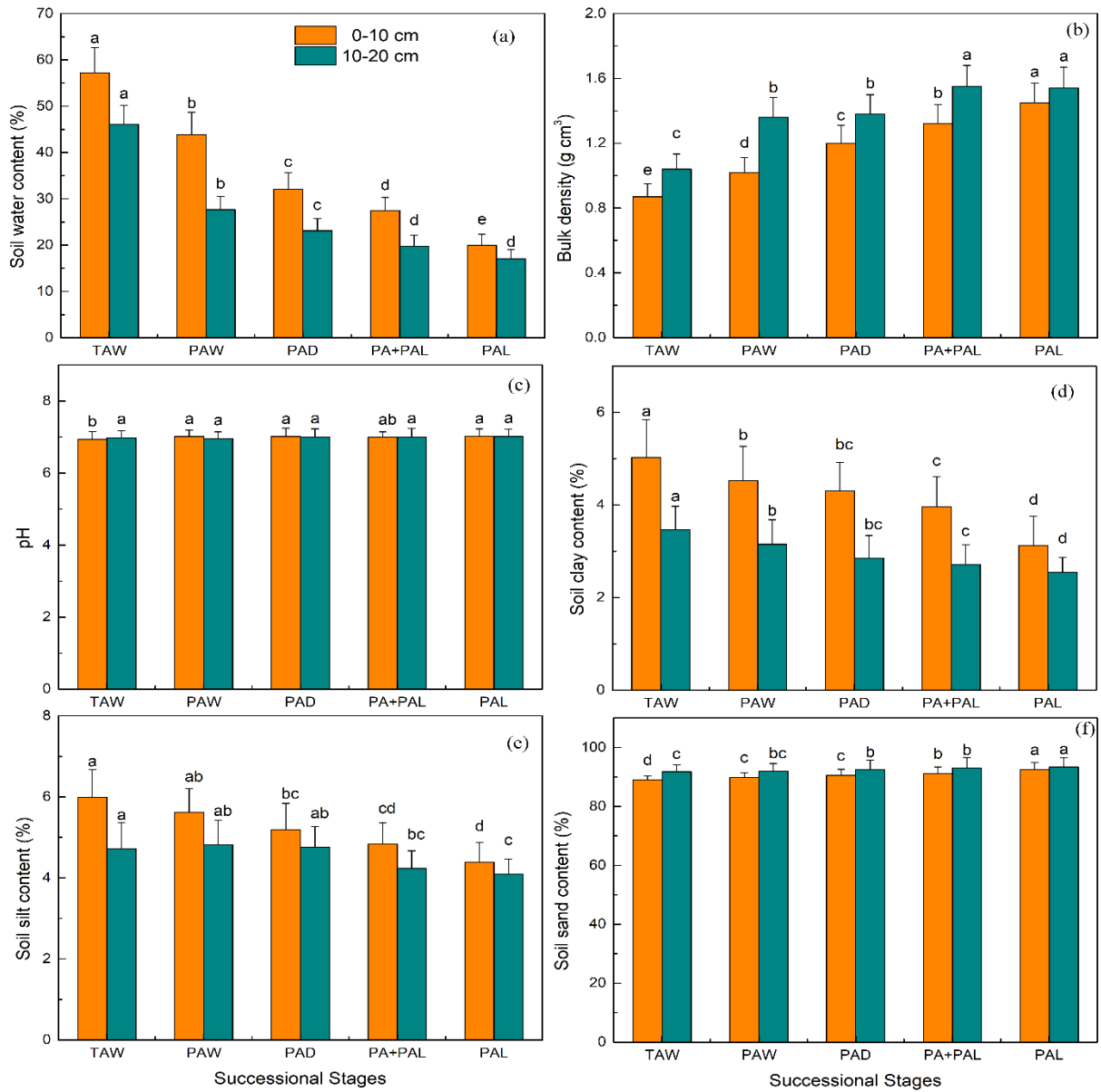


Figure S1. Soil water content (a), bulk density (b), pH (c), soil clay content (d), soil silt content (e) and soil sand content (f) in different stages of wetland drying process in June. Values are Mean $\pm$ SE ($n = 9$). Different letters over the bars indicate statistically significant differences between different stages. TAW, *T. augustifolia* wetland; PAW, *P. australis* wetland; PAD, *P. australis* dry land; PA+PAL, mixed grassland with *P. australis* and *P. arundinacea* L.; PAL, *P. arundinacea* L. grassland.

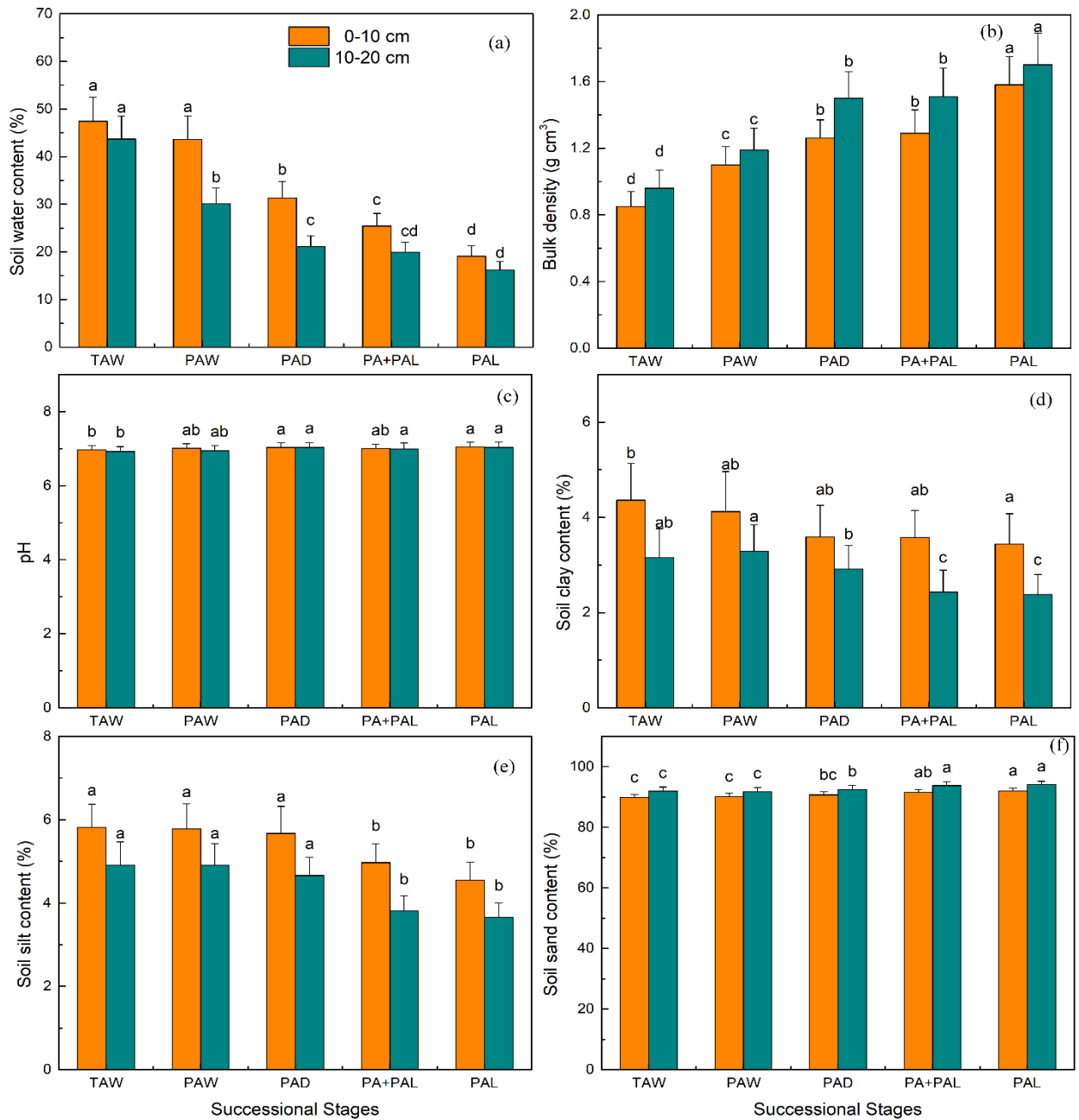


Figure S2. Soil water content (a), bulk density (b), pH (c), soil clay content (d), soil silt content (e) and soil sand content (f) in different stages of wetland drying process in October. Values are Mean $\pm$ SE ($n = 9$). Different letters over the bars indicate statistically significant differences between different stages. TAW, *T. augustifolia* wetland; PAW, *P. australis* wetland; PAD, *P. australis* dry land; PA+PAL, mixed grassland with *P. australis* and *P. arundinacea* L.; PAL, *P. arundinacea* L. grassland.

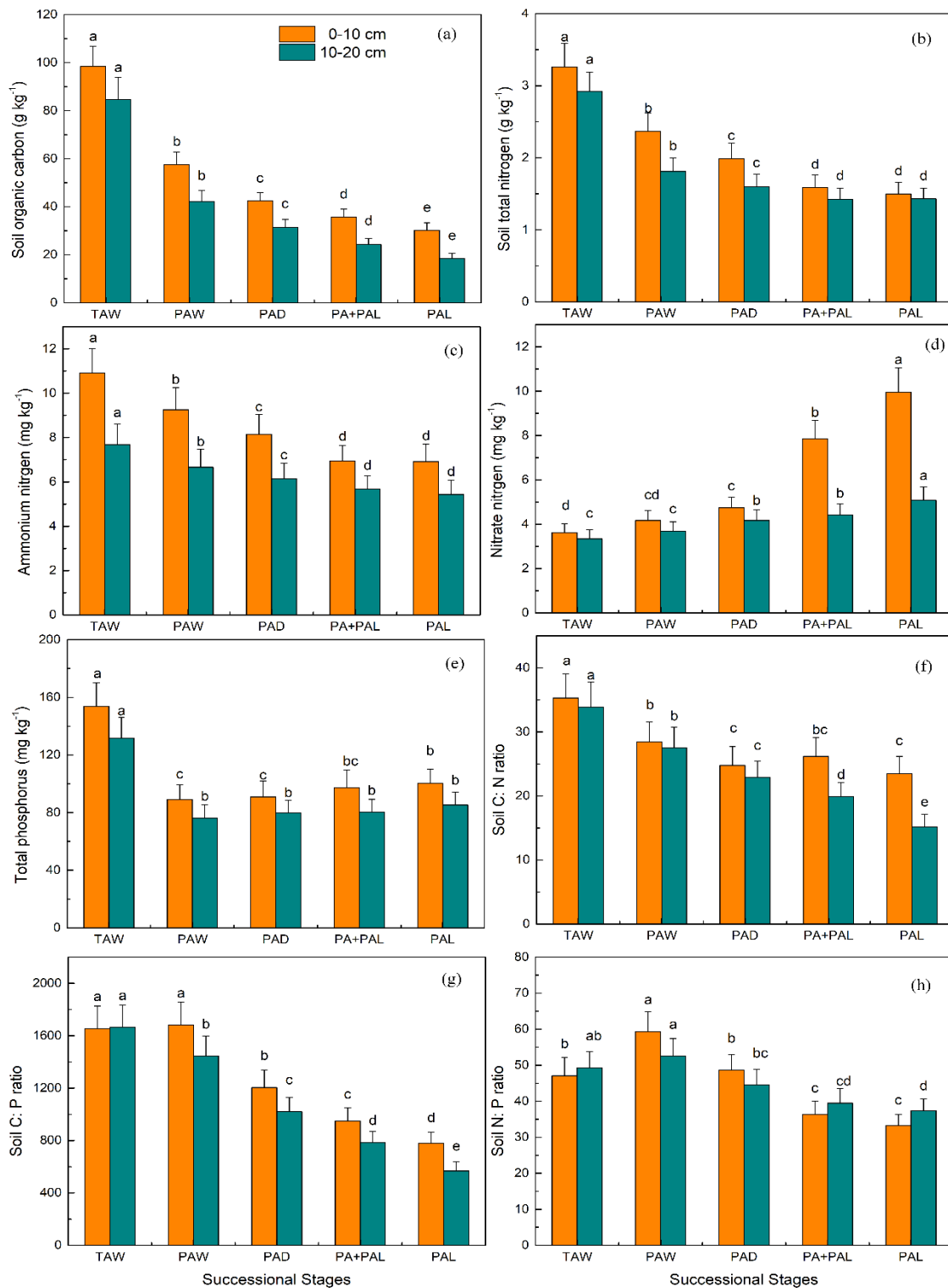


Figure S3. Soil organic carbon (a), total nitrogen content (b), ammonium nitrogen (c), nitrate nitrogen (d), total phosphorus content (e), soil C: N ratio (f), soil C: P ratio (g) and soil N: P ratio (h) in different stages of wetland drying process in June. Values are Mean ± SE ($n = 9$). Different letters over the bars indicate statistically significant differences between different stages. TAW, *T. augustifolia* wetland; PAW, *P. australis* wetland; PAD, *P. australis* dry land; PA+PAL, mixed grassland with *P. australis* and *P. arundinacea* L.; PAL, *P. arundinacea* L. grassland.

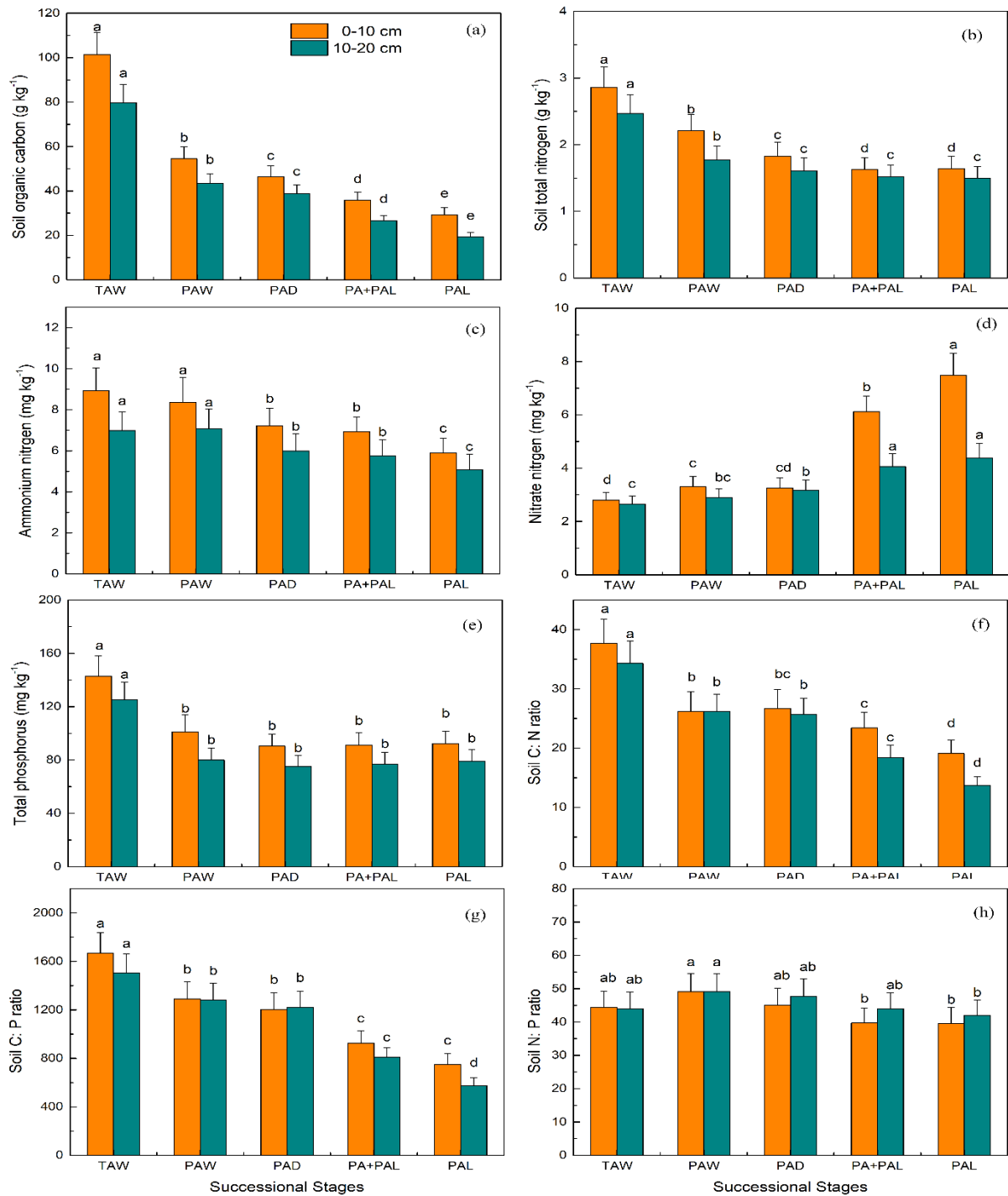


Figure S4. Soil organic carbon (a), total nitrogen content (b), ammonium nitrogen (c), nitrate nitrogen (d), total phosphorus content (e), soil C: N ratio (f), soil C: P ratio (g) and soil N: P ratio (h) in different stages of wetland drying process in October. Values are Mean $\pm$ SE ($n = 9$). Different letters over the bars indicate statistically significant differences between different stages. TAW, *T. augustifolia* wetland; PAW, *P. australis* wetland; PAD, *P. australis* dry land; PA+PAL, mixed grassland with *P. australis* and *P. arundinacea* L.; PAL, *P. arundinacea* L. grassland.

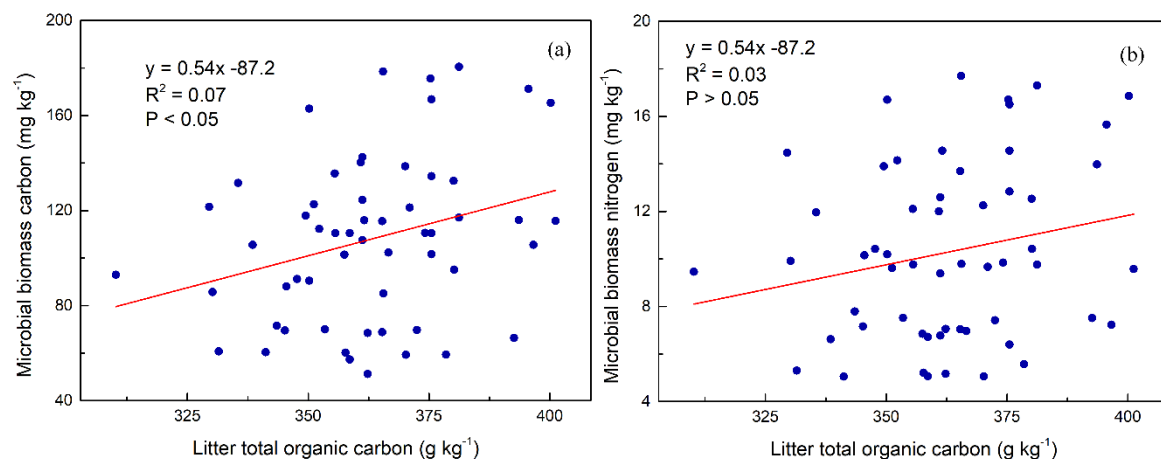


Figure S5. The relationships between soil MBC (a) and MBN (b) contents and litter total organic carbon content.

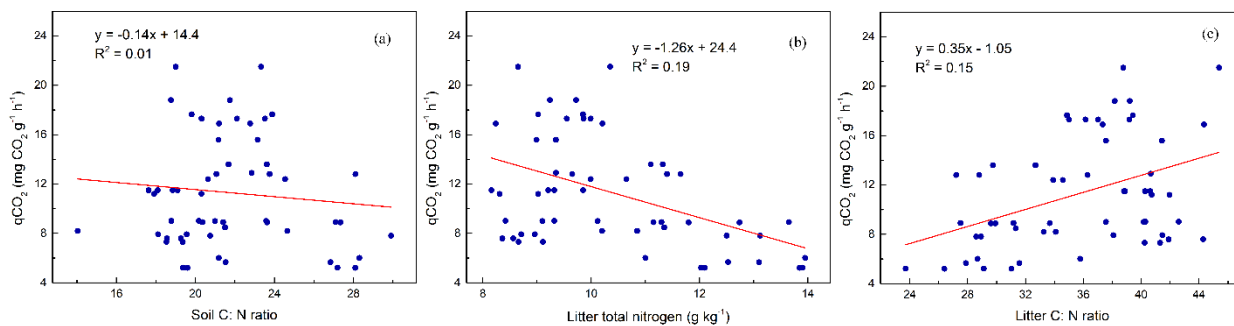


Figure S6. The relationships between soil microbial metabolic quotient (qCO_2) with soil C: N ratio (a), litter total nitrogen content (b) and litter C: N ratio (c).

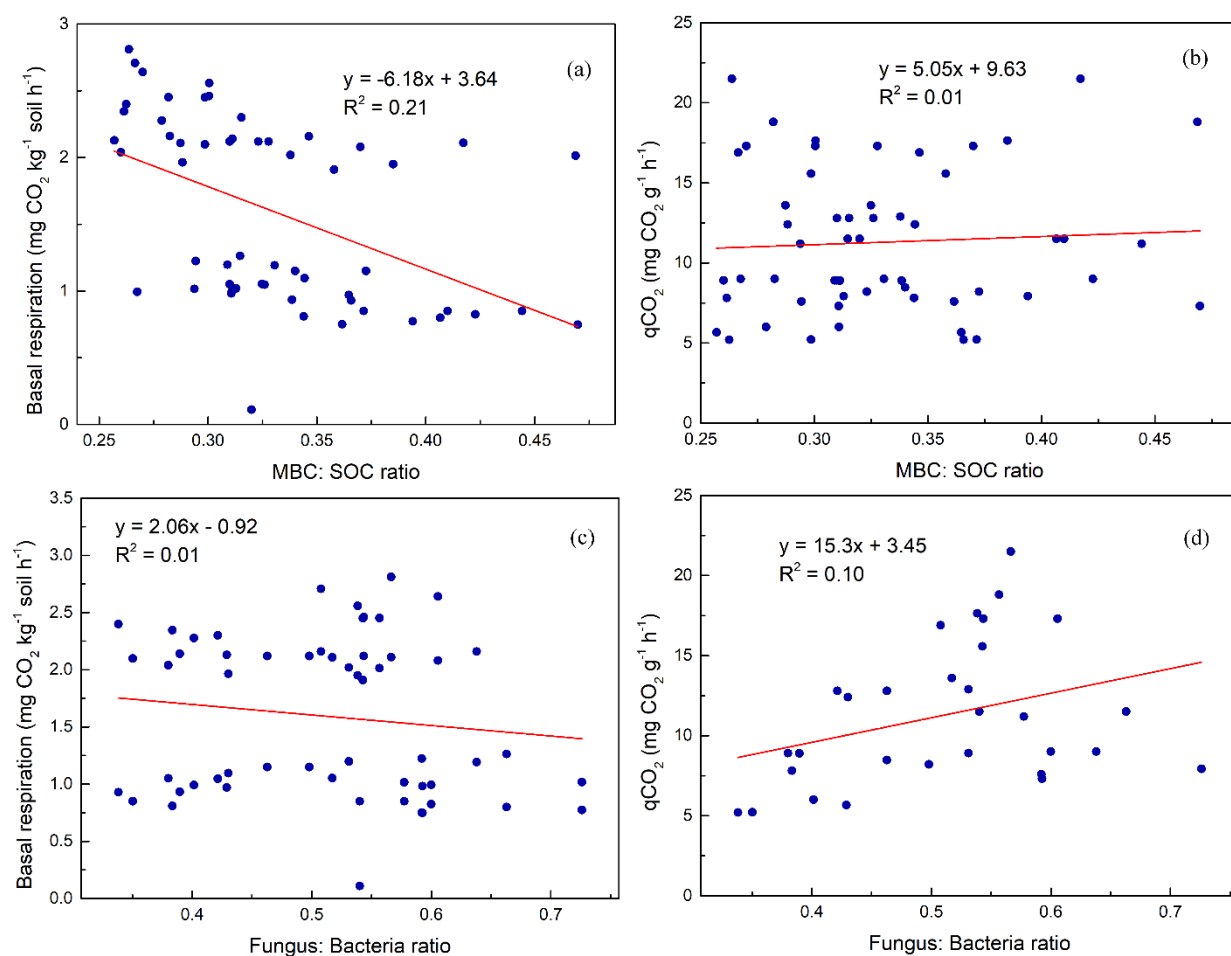


Figure S7. The relationships between soil basal respiration and microbial quotient (MBC: SOC ratio) (a) and fungi: bacteria ratio (c) and the relationships between soil microbial metabolic quotient ($q\text{CO}_2$) (b) and microbial quotient (MBC: SOC ratio) and fungi: bacteria ratio (d).