

Supplemental Table 1. The Q_{10} values of CO_2 , CH_4 and CO_2+CH_4 production among different vegetation types.

		283 - 293 K	293 – 303 K
CO_2	Phragmites vegetation	1.94	1.90
	Juncus vegetation	4.69	2.53
	Miscanthus+Cirsium vegetation	2.17	2.10
CH_4	Phragmites vegetation	2.31	1.79
	Juncus vegetation	4.47	1.66
	Miscanthus+Cirsium vegetation	6.24	1.96
$CO_2 + CH_4$	Phragmites vegetation	2.00	1.88
	Juncus vegetation	4.63	2.31
	Miscanthus+Cirsium vegetation	2.34	2.09

Supplemental Table 2. The rate constant at 10°C (k_{10}) and activation energy of rate constant (E_I) for CO₂ and CH₄ production in each vegetation types

	Vegetation types	k_{10}	E_I
CO ₂	Phragmites vegetation	$1.60 \times 10^{-3} \pm 2.60 \times 10^{-5}$ a	$7.04 \times 10^4 \pm 5.08 \times 10^2$ b
	Juncus vegetation	$3.63 \times 10^{-4} \pm 8.31 \times 10^{-5}$ b	$1.04 \times 10^5 \pm 8.02 \times 10^2$ a
	Miscanthus+Cirsium vegetation	$1.03 \times 10^{-3} \pm 6.18 \times 10^{-5}$ c	$7.53 \times 10^4 \pm 2.40 \times 10^2$ b
CH ₄	Phragmites vegetation	$2.25 \times 10^{-4} \pm 2.67 \times 10^{-6}$ a	$5.30 \times 10^4 \pm 3.71 \times 10^2$ b
	Juncus vegetation	$1.72 \times 10^{-4} \pm 7.61 \times 10^{-6}$ b	$5.96 \times 10^4 \pm 1.18 \times 10^3$ b
	Miscanthus+Cirsium vegetation	$5.92 \times 10^{-5} \pm 4.96 \times 10^{-6}$ c	$7.66 \times 10^4 \pm 3.04 \times 10^2$ a

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338 **Supplemental Table 3. Decomposition rate constant (k_I) of CO₂, CH₄ and**
 339 **CO₂+CH₄ production from each vegetation soils under each incubation**
 340 **temperature**

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		283 K	293 K	303 K
CO ₂	Phragmites vegetation	1.60×10^{-3}	4.44×10^{-3}	1.15×10^{-2}
	Juncus vegetation	3.63×10^{-4}	1.65×10^{-3}	6.78×10^{-3}
	Miscanthus+Cirsium vegetation	1.03×10^{-3}	3.08×10^{-3}	8.55×10^{-3}
CH ₄	Phragmites vegetation	2.25×10^{-4}	4.86×10^{-4}	9.97×10^{-4}
	Juncus vegetation	1.72×10^{-4}	4.07×10^{-4}	9.13×10^{-4}
	Miscanthus+Cirsium vegetation	5.92×10^{-5}	1.80×10^{-4}	5.97×10^{-4}
CO ₂ +CH ₄	Phragmites vegetation	1.80×10^{-3}	5.47×10^{-3}	1.54×10^{-2}
	Juncus vegetation	5.00×10^{-4}	2.22×10^{-3}	8.96×10^{-3}
	Miscanthus+Cirsium vegetation	1.06×10^{-3}	3.39×10^{-3}	9.98×10^{-3}

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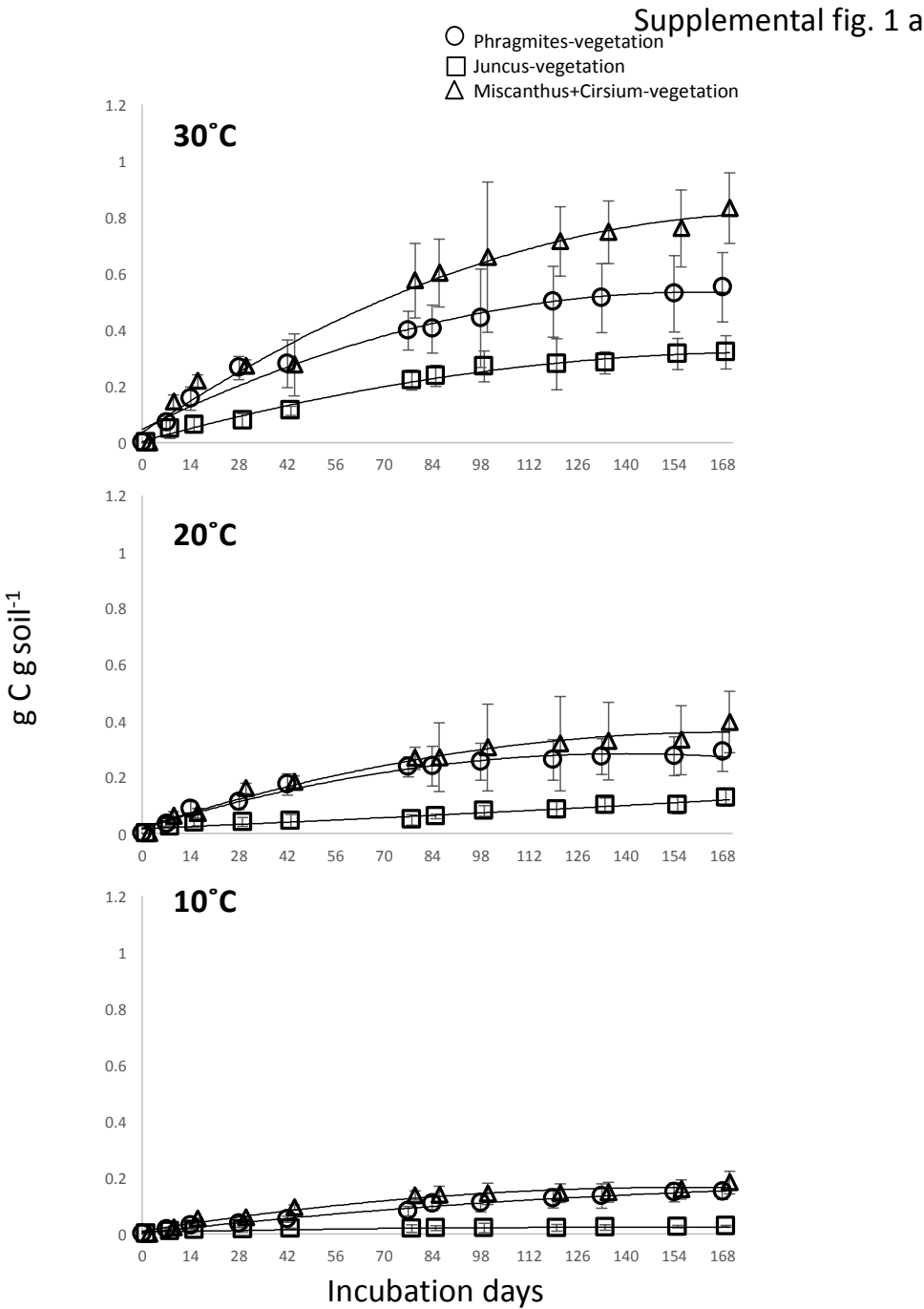
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6 345 **Supplemental figure 1.** CO₂ and CH₄ production during incubation period in each
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9 346 vegetation types and incubation temperature. Opened circle; P-vegetation, opened
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12 347 square; J-vegetation and opened triangle; M&C-vegetation. (a) CO₂ production and (b);
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15 348 CH₄ production
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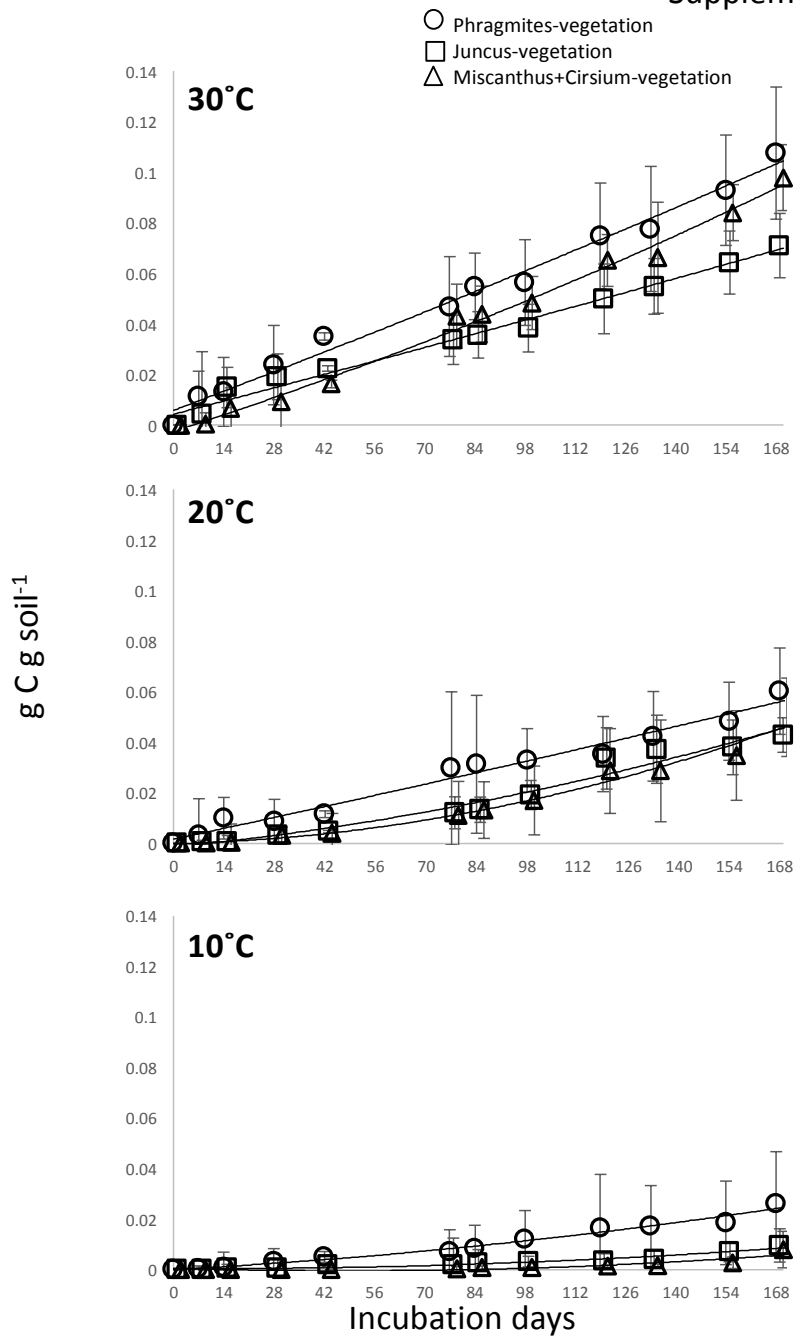
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Error bars indicate the standard variation of each sample (n=5).

Supplemental fig. 1 b



Error bars indicate the standard variation of each sample (n=5).