Table S1. Model output for the carbon mineralization analysis. The optimal model (OM) was a LME model that incorporated Core Identity as a random effect (L. ratio = 10.709, df_1, p_{corr} = 0.001) and allowed the residual spread to increase exponentially over Time and to vary by Treatment (L. ratio = 123.925, df_2, p < 0.001):

$$Carbon_{ij} = Intercept + Time_{ij} + Treatment_{ij} + Month_{ij} + \\ Time_{ij} \times Treatment_{ij} + Treatment_{ij} \times Month_{ij} + a_i + \varepsilon_{ij}$$

$$a_i \sim N(0, \sigma^2_{Core})$$

$$\varepsilon_{ij} \sim N(0, \sigma^2_k \times e^{2\delta \times Time_{ij}})$$

where a_i is a random intercept and the index *i* refers to the core identity (*i* = 1,..., 18), *j* to the observations within each core (*j* = 1,...,6) and *k* to the treatment (*k* = 1,..., 2). Random effect (a), variance function (b), correlation coefficients of observations made within each variance grouping (intra-class correlation) and fixed effects (d). *Note the intercept (baseline) is the faecal pellet treatment in May.

(a)	**Model term**	**σ**
	Core ID	0.031

(b)	**Variance term**	**Variance estimates**
	δ	0.300
	Faecal pellet	$0.016^2 \times e^{2 \times 0.300 \times Time_{ij}}$
	Diatom	$(0.016 \times 4.130)^2 \times e^{2 \times 0.300 \times Time_{ij}}$

(c)	Time	Intra-class correlation FP	Diatom
	1	0.526	0.061
	2	0.250	0.019
	3	0.091	0.006
	4	0.029	0.002
	5	0.009	0.001

(d)	**Model term**	**Value ± SE**	**df**	**t**	**p**
	Intercept*	-0.035 ± 0.015	117	-2.250	0.027
	Time	0.053 ± 0.003	117	16.205	<0.001
	Diatom	-0.175 ± 0.043	20	-4.136	<0.001
	October	<-0.001 ± 0.010	20	-0.013	0.990
	Time×Diatom	0.138 ± 0.014	117	9.795	<0.001
	Diatom×October	0.138 ± 0.044	20	3.153	0.005