

Supplementary Information

Viral lysing can alleviate microbial nutrient limitations and accumulate the recalcitrant dissolved organic matter components in soil

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Table S1. Relationships of the relative abundances of bacterial taxa with microbial physiological traits and optical properties of DOM.

Temp	OTU	Measured variables	Correlation	P value	Phylum	Class	Order	Family	Genus
25°C	OTU1838	SUV254	-0.505	0.023	p_Protobacteria	c_Gammaproteobacteria	o_Xanthomonadales	f_Rhodanobacteraceae	g_Rhodanobacter
25°C	OTU1838	SUV260	-0.520	0.019	p_Protobacteria	c_Gammaproteobacteria	o_Xanthomonadales	f_Rhodanobacteraceae	g_Rhodanobacter
25°C	OTU787	Angle	0.574	0.008	p_Protobacteria	c_Gammaproteobacteria	o_Xanthomonadales	f_Rhodanobacteraceae	g_Frateuria
25°C	OTU910	SUV254	-0.540	0.014	p_Protobacteria	c_Gammaproteobacteria	o_Xanthomonadales	f_Rhodanobacteraceae	g_Rhodanobacter
25°C	OTU910	SUV260	-0.550	0.012	p_Protobacteria	c_Gammaproteobacteria	o_Xanthomonadales	f_Rhodanobacteraceae	g_Rhodanobacter
25°C	OTU923	Angle	-0.674	0.001	p_Bacteroidota	c_Bacteroidia	o_Bacteroidales	f_Prevotellaceae	g_Prevotella
25°C	OTU923	HIX	0.681	0.001	p_Bacteroidota	c_Bacteroidia	o_Bacteroidales	f_Prevotellaceae	g_Prevotella
25°C	OTU1043	SUV254	-0.535	0.015	p_Protobacteria	c_Gammaproteobacteria	o_Xanthomonadales	f_Rhodanobacteraceae	g_Rhodanobacter
25°C	OTU1043	SUV260	-0.543	0.013	p_Protobacteria	c_Gammaproteobacteria	o_Xanthomonadales	f_Rhodanobacteraceae	g_Rhodanobacter
25°C	OTU26	SUV260	-0.511	0.021	p_Actinobacteriota	c_Actinobacteria	o_Micrococcales	f_Micrococcaceae	g_Pseudarthrobacter
25°C	OTU26	Angle	0.520	0.019	p_Actinobacteriota	c_Actinobacteria	o_Micrococcales	f_Micrococcaceae	g_Pseudarthrobacter
25°C	OTU960	Angle	-0.697	0.001	p_Bacteroidota	c_Bacteroidia	o_Sphingobacteriales	f_Sphingobacteriaceae	g_norank_f_ST-12K33
25°C	OTU960	HIX	0.652	0.002	p_Bacteroidota	c_Bacteroidia	o_Sphingobacteriales	f_Sphingobacteriaceae	g_norank_f_ST-12K33
25°C	OTU44	Angle	-0.538	0.014	p_Protobacteria	c_Alphaproteobacteria	o_Rhizobiales	f_Bejerinckiaceae	g_Methylovirgula
25°C	OTU44	HIX	0.534	0.015	p_Protobacteria	c_Alphaproteobacteria	o_Rhizobiales	f_Bejerinckiaceae	g_Methylovirgula
25°C	OTU43	Angle	0.522	0.018	p_Actinobacteriota	c_Actinobacteria	o_Micrococcales	f_Micrococcaceae	g_Simonomas
25°C	OTU768	Angle	-0.697	0.001	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Agathobacter
25°C	OTU768	HIX	0.652	0.002	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Agathobacter
25°C	OTU968	Angle	-0.681	0.001	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_Faecalibacterium
25°C	OTU968	HIX	0.704	0.001	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_Faecalibacterium
25°C	OTU51	SUV254	-0.616	0.004	c_norank_p_WPS-2	c_norank_p_WPS-2	c_norank_p_WPS-2	f_norank_o_norank_c_norank_p_WPS-2	g_norank_f_norank_o_norank_c_norank_p_WPS-2
25°C	OTU51	SUV260	-0.626	0.003	c_norank_p_WPS-2	c_norank_p_WPS-2	c_norank_p_WPS-2	f_norank_o_norank_c_norank_p_WPS-2	g_norank_f_norank_o_norank_c_norank_p_WPS-2
25°C	OTU51	Angle	0.680	0.001	c_norank_p_WPS-2	c_norank_p_WPS-2	c_norank_p_WPS-2	f_norank_o_norank_c_norank_p_WPS-2	g_norank_f_norank_o_norank_c_norank_p_WPS-2
25°C	OTU51	HIX	-0.734	0.000	c_norank_p_WPS-2	c_norank_p_WPS-2	c_norank_p_WPS-2	f_norank_o_norank_c_norank_p_WPS-2	g_norank_f_norank_o_norank_c_norank_p_WPS-2
25°C	OTU776	Angle	-0.695	0.001	p_Firmicutes	c_Clostridia	o_norank_c_Clostridia	f_Hungateiclostridiaceae	g_Fastidiosipila
25°C	OTU776	HIX	0.649	0.002	p_Firmicutes	c_Clostridia	o_norank_c_Clostridia	f_Hungateiclostridiaceae	g_Fastidiosipila
25°C	OTU932	Angle	-0.693	0.001	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Fusicatenibacter
25°C	OTU932	HIX	0.645	0.002	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Fusicatenibacter
25°C	OTU1329	HIX	0.528	0.017	p_Bacteroidota	c_Bacteroidia	o_Bacteroidales	f_Bacteroidaceae	g_Bacteroides
25°C	OTU30	SUV254	0.584	0.007	p_Actinobacteriota	c_Actinobacteria	o_Streptomycetales	f_Streptomycetaceae	g_Streptomyces
25°C	OTU30	SUV260	0.613	0.004	p_Actinobacteriota	c_Actinobacteria	o_Streptomycetales	f_Streptomycetaceae	g_Streptomyces
25°C	OTU30	Angle	-0.628	0.003	p_Actinobacteriota	c_Actinobacteria	o_Streptomycetales	f_Streptomycetaceae	g_Streptomyces
25°C	OTU30	HIX	0.698	0.001	p_Actinobacteriota	c_Actinobacteria	o_Streptomycetales	f_Streptomycetaceae	g_Streptomyces
25°C	OTU1054	Angle	-0.693	0.001	p_Cloacimonadota	c_Cloacimonadota	o_Cloacimonadales	f_Cloacimonadaceae	g_W5
25°C	OTU1054	HIX	0.645	0.002	p_Cloacimonadota	c_Cloacimonadota	o_Cloacimonadales	f_Cloacimonadaceae	g_W5
25°C	OTU840	Angle	-0.692	0.001	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Blaugia
25°C	OTU840	HIX	0.647	0.002	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Blaugia
25°C	OTU987	Angle	-0.699	0.001	p_Firmicutes	c_Clostridia	o_Peptostreptococcales-Tissierellales	f_norank_o_Peptostreptococcales-Tissierellales	g_W5053
25°C	OTU987	HIX	0.660	0.002	p_Firmicutes	c_Clostridia	o_Peptostreptococcales-Tissierellales	f_norank_o_Peptostreptococcales-Tissierellales	g_W5053
25°C	OTU994	Angle	-0.693	0.001	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Blaugia
25°C	OTU994	HIX	0.645	0.002	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Blaugia
25°C	OTU844	Angle	-0.697	0.001	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_unclassified_f_Ruminococcaceae
25°C	OTU844	HIX	0.652	0.002	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_unclassified_f_Ruminococcaceae
25°C	OTU938	Angle	-0.684	0.001	p_Protobacteria	c_Gammaproteobacteria	o_Alteromonadales	f_Pseudoalteromonadaceae	g_Pseudoalteromonas
25°C	OTU938	HIX	0.630	0.003	p_Protobacteria	c_Gammaproteobacteria	o_Alteromonadales	f_Pseudoalteromonadaceae	g_Pseudoalteromonas
25°C	OTU794	Angle	-0.697	0.001	p_Bacteroidota	c_Bacteroidia	o_Bacteroidales	f_Bacteroidaceae	g_Bacteroides
25°C	OTU794	HIX	0.652	0.002	p_Bacteroidota	c_Bacteroidia	o_Bacteroidales	f_Bacteroidaceae	g_Bacteroides
25°C	OTU1091	Angle	-0.693	0.001	p_Bacteroidota	c_Bacteroidia	o_Bacteroidales	f_Bacteroidaceae	g_Bacteroides
25°C	OTU1091	HIX	0.645	0.002	p_Bacteroidota	c_Bacteroidia	o_Bacteroidales	f_Bacteroidaceae	g_Bacteroides
25°C	OTU982	Angle	-0.571	0.009	p_Bacteroidota	c_Bacteroidia	o_Bacteroidales	f_Bacteroidaceae	g_Bacteroides
25°C	OTU1185	Angle	-0.693	0.001	p_Firmicutes	c_Clostridia	o_Clostridiales	f_Clostridiaceae	g_Clostridium sensu stricto 1
25°C	OTU1185	HIX	0.645	0.002	p_Firmicutes	c_Clostridia	o_Clostridiales	f_Clostridiaceae	g_Clostridium sensu stricto 1
25°C	OTU1327	Angle	-0.699	0.001	p_Firmicutes	c_Bacilli	o_Erysipelotrichales	f_Erysipelotrichaceae	g_Holdemanna
25°C	OTU1327	HIX	0.660	0.002	p_Firmicutes	c_Bacilli	o_Erysipelotrichales	f_Erysipelotrichaceae	g_Holdemanna
25°C	OTU1028	Angle	-0.697	0.001	p_Firmicutes	c_Negativicutes	o_Veillonellales-Selenomonadales	f_Veillonellaceae	g_Dialister
25°C	OTU1028	HIX	0.652	0.002	p_Firmicutes	c_Negativicutes	o_Veillonellales-Selenomonadales	f_Veillonellaceae	g_Dialister
25°C	OTU1154	Angle	-0.699	0.001	p_Firmicutes	c_Clostridia	o_norank_c_Clostridia	f_Hungateiclostridiaceae	g_Fastidiosipila
25°C	OTU1154	HIX	0.657	0.002	p_Firmicutes	c_Clostridia	o_norank_c_Clostridia	f_Hungateiclostridiaceae	g_Fastidiosipila
25°C	OTU1244	Angle	-0.699	0.001	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Eubacterium hallii group
25°C	OTU1244	HIX	0.657	0.002	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Eubacterium hallii group
25°C	OTU895	Angle	-0.697	0.001	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_Ruminococcus
25°C	OTU895	HIX	0.652	0.002	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_Ruminococcus
25°C	OTU602	Angle	-0.680	0.001	p_Protobacteria	c_Gammaproteobacteria	o_Diploricetiales	f_Diploricetaceae	g_norank_f_Diploricetaceae
25°C	OTU602	HIX	0.639	0.002	p_Protobacteria	c_Gammaproteobacteria	o_Diploricetiales	f_Diploricetaceae	g_norank_f_Diploricetaceae
25°C	OTU1165	Angle	-0.697	0.001	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_Ruminococcus
25°C	OTU1165	HIX	0.652	0.002	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_Ruminococcus
25°C	OTU898	Angle	-0.697	0.001	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Blaugia
25°C	OTU898	HIX	0.652	0.002	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Blaugia
25°C	OTU32	SUV254	0.551	0.012	p_Protobacteria	c_Gammaproteobacteria	o_Burkholderiales	f_Burkholderiaceae	g_Ralstonia
25°C	OTU32	SUV260	0.551	0.012	p_Protobacteria	c_Gammaproteobacteria	o_Burkholderiales	f_Burkholderiaceae	g_Ralstonia
25°C	OTU32	Angle	-0.687	0.001	p_Protobacteria	c_Gammaproteobacteria	o_Burkholderiales	f_Burkholderiaceae	g_Ralstonia
25°C	OTU32	HIX	0.546	0.013	p_Protobacteria	c_Gammaproteobacteria	o_Burkholderiales	f_Burkholderiaceae	g_Ralstonia
25°C	OTU879	Angle	-0.699	0.001	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_norank_f_Eubacterium coprostanoligenes group
25°C	OTU879	HIX	0.652	0.002	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_norank_f_Eubacterium coprostanoligenes group
25°C	OTU1035	Angle	-0.693	0.001	p_Firmicutes	c_Clostridia	o_Peptostreptococcales-Tissierellales	f_norank_o_Peptostreptococcales-Tissierellales	g_Gallicola
25°C	OTU1035	HIX	0.656	0.002	p_Firmicutes	c_Clostridia	o_Peptostreptococcales-Tissierellales	f_norank_o_Peptostreptococcales-Tissierellales	g_Gallicola
25°C	OTU607	Angle	-0.697	0.001	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Lachnospiraceae NK4A136 group
25°C	OTU607	HIX	0.652	0.002	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Lachnospiraceae NK4A136 group
25°C	OTU1191	Angle	-0.697	0.001	p_Firmicutes	c_Clostridia	o_Peptostreptococcales-Tissierellales	f_norank_o_Peptostreptococcales-Tissierellales	g_W5053
25°C	OTU1191	HIX	0.652	0.002	p_Firmicutes	c_Clostridia	o_Peptostreptococcales-Tissierellales	f_norank_o_Peptostreptococcales-Tissierellales	g_W5053
25°C	OTU921	Angle	-0.575	0.008	p_Bacteroidota	c_Bacteroidia	o_Bacteroidales	f_Bacteroidaceae	g_Bacteroides
25°C	OTU921	HIX	0.552	0.012	p_Bacteroidota	c_Bacteroidia	o_Bacteroidales	f_Bacteroidaceae	g_Bacteroides
25°C	OTU941	Angle	-0.543	0.013	p_Firmicutes	c_Bacilli	o_Bacillales	f_Bacillaceae	g_Bacillus
25°C	OTU839	Angle	-0.699	0.001	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_Ruminococcus
25°C	OTU839	HIX	0.660	0.002	p_Firmicutes	c_Clostridia	o_Oscillospirales	f_Ruminococcaceae	g_Ruminococcus
25°C	OTU600	Angle	-0.699	0.001	p_Firmicutes	c_Clostridia	o_Christensenellales	f_Christensenellaceae	g_Christensenellaceae R-7 group
25°C	OTU600	HIX	0.657	0.002	p_Firmicutes	c_Clostridia	o_Christensenellales	f_Christensenellaceae	g_Christensenellaceae R-7 group
25°C	OTU1179	Angle	-0.551	0.012	p_Bacteroidota	c_Bacteroidia	o_Bacteroidales	f_Bacteroidaceae	g_Bacteroides
25°C	OTU686	Angle	-0.697	0.001	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Blaugia
25°C	OTU686	HIX	0.652	0.002	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Blaugia
25°C	OTU1254	Angle	0.755	0.000	p_Protobacteria	c_Gammaproteobacteria	o_Xanthomonadales	f_Rhodanobacteraceae	g_Dyella
25°C	OTU1254	HIX	-0.548	0.012	p_Protobacteria	c_Gammaproteobacteria	o_Xanthomonadales	f_Rhodanobacteraceae	g_Dyella
25°C	OTU1064	Angle	-0.693	0.001	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Dorea
25°C	OTU1064	HIX	0.645	0.002	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Dorea
25°C	OTU814	SUV254	0.502	0.024	p_Protobacteria	c_Gammaproteobacteria	o_Pseudomonadales	f_Pseudomonadaceae	g_Pseudomonas
25°C	OTU814	Angle	-0.811	0.000	p_Protobacteria	c_Gammaproteobacteria	o_Pseudomonadales	f_Pseudomonadaceae	g_Pseudomonas
25°C	OTU814	HIX	0.664	0.001	p_Protobacteria	c_Gammaproteobacteria	o_Pseudomonadales	f_Pseudomonadaceae	g_Pseudomonas
25°C	OTU37	Angle	-0.521	0.019	p_Protobacteria	c_Alphaproteobacteria	o_Caulobacteriales	f_Caulobacteriaceae	g_norank_f_Caulobacteriaceae
25°C	OTU1214	Angle	-0.697	0.001	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Roseburia
25°C	OTU1214	HIX	0.652	0.002	p_Firmicutes	c_Clostridia	o_Lachnospirales	f_Lachnospiraceae	g_Roseburia
25°C	OTU757	SUV254	0.537	0.015	p_Protobacteria	c_Gammaproteobacteria	o_Enterobacteriales	f_Enterobacteriaceae	g_Escherichia-Shigella
25°C	OTU757	SUV260	0.525	0.017	p_Protobacteria	c_Gammaproteobacteria	o_Enterobacteriales	f_Enterobacteriaceae	g_Escherichia-Shigella
25°C	OTU757	Angle	-0.555	0.011	p_Protobacteria	c_Gammaproteobacteria	o_Enterobacteriales	f_Enterobacteriaceae	g_Escherichia-Shigella
25°C	OTU757	HIX	0.690	0.001	p_Protobacteria	c_Gammaproteobacteria	o_Enterobacteriales	f_Enterobacteriaceae	g_Escherichia-Shigella
25°C	OTU866	Angle	-0.697	0.001	p_Acidobacteriota	c_A			

Table S2. Soil properties in different groups (mean ±std dev).

Soil properties	25-SM	25-DV	25-V	25-2 ¹ V	25-10 ¹ V	15-SM	15-DV	15-V	15-2 ¹ V	15-10 ¹ V	Day
TN	0.939±0.010	0.936±0.006	0.924±0.014	0.917±0.008	0.929±0.012	0.901±0.013	0.839±0.022	0.828±0.019	0.833±0.015	0.816±0.016	7day
SOC	13.157±0.179	13.349±0.212	13.066±0.045	13.436±0.169	13.808±0.102	13.262±0.150	12.978±0.185	13.335±0.134	13.261±0.090	13.185±0.222	7day
C/N	14.007±0.075	14.269±0.198	14.149±0.197	14.653±0.153	14.876±0.304	14.725±0.195	15.496±0.262	16.115±0.233	15.932±0.256	16.163±0.133	7day
DOC	381.475±15.788	388.300±21.582	258.013±4.297	391.825±13.741	484.188±19.134	537.375±13.895	252.800±2.635	245.263±6.003	444.838±20.871	388.250±19.979	7day
DON	121.763±1.014	114.288±2.577	97.125±1.176	116.063±2.172	133.800±2.434	131.988±4.523	102.763±0.741	100.063±1.852	121.513±8.878	114.725±7.412	7day
MBC	376.667±13.614	283.111±66.168	320.222±23.435	387.556±98.145	322.000±23.401	246.222±37.102	420.667±50.937	379.111±6.206	143.333±59.908	252.889±31.865	7day
MBN	14.815±3.069	20.741±1.001	7.407±1.210	21.481±1.512	28.333±7.354	27.407±9.017	19.259±1.090	21.235±6.696	40.000±5.030	24.444±3.230	7day
MC/N	23.039±6.527	13.650±3.190	45.496±4.795	18.637±5.568	13.891±3.799	10.970±2.064	22.262±3.501	23.155±6.011	3.583±1.498	10.345±1.304	7day
MBP	2.205±0.045	9.046±0.265	13.645±0.918	4.538±1.493	4.499±0.277	7.642±2.258	2.095±0.470	6.295±0.649	2.211±0.757	7.994±0.595	7day
MC/P	171.365±9.510	32.008±8.525	24.033±2.984	103.391±24.227	72.872±7.914	59.030±32.860	221.999±39.675	62.355±6.878	87.304±28.071	31.218±1.976	7day
MN/P	6.774±1.517	2.299±0.068	0.564±0.116	6.944±2.597	6.322±1.700	5.906±2.863	11.171±3.244	3.270±0.846	26.466±9.499	3.116±0.262	7day
TP	0.288±0.011	0.350±0.022	0.415±0.013	0.287±0.006	0.303±0.007	0.314±0.009	0.317±0.005	0.305±0.008	0.456±0.003	0.302±0.008	7day
C/P	45.885±1.950	36.762±1.262	31.564±0.998	46.908±0.750	43.100±2.207	43.308±0.422	40.896±0.302	43.896±1.514	29.101±0.343	41.365±2.422	7day
N/P	3.276±0.143	2.580±0.116	2.233±0.085	3.202±0.061	2.907±0.188	2.942±0.041	2.641±0.041	2.729±0.131	1.828±0.033	2.559±0.144	7day
AP	3.762±0.121	2.858±0.190	1.702±0.126	3.408±0.169	3.010±0.205	4.618±0.214	6.502±0.850	3.131±0.346	3.770±0.344	3.577±0.552	7day
NH ₄ ⁺	8.984±0.843	10.192±0.271	11.265±0.167	8.060±0.252	6.961±0.572	8.362±0.430	11.177±0.090	12.061±0.048	13.635±0.861	9.737±0.368	7day
NO ₃ ⁻	0.763±0.001	0.799±0.016	0.650±0.013	0.749±0.013	0.864±0.004	0.836±0.019	0.614±0.012	0.610±0.011	0.798±0.010	0.791±0.015	7day
BG/MBC	0.125±0.045	2.032±0.406	0.260±0.034	1.258±0.446	1.054±0.120	2.660±0.575	0.083±0.009	0.177±0.006	6.402±3.271	1.701±0.271	7day
CBH/MBC	0.195±0.015	0.557±0.094	0.022±0.002	0.441±0.132	0.262±0.025	2.113±0.356	0.045±0.006	0.008±0.001	5.434±2.575	1.318±0.210	7day
NAG/MBC	0.032±0.002	0.061±0.010	0.036±0.006	0.278±0.152	0.359±0.091	0.502±0.107	0.061±0.018	0.095±0.008	1.455±0.661	0.421±0.077	7day
LAP/MBC	0.051±0.018	0.061±0.010	0.036±0.006	0.066±0.023	0.025±0.004	0.088±0.016	0.065±0.011	0.067±0.003	0.227±0.076	0.125±0.038	7day
AP/MBC	1.203±0.167	1.615±0.210	1.622±0.070	2.366±0.812	1.040±0.141	1.278±0.188	1.098±0.169	1.175±0.038	4.525±2.101	1.199±0.163	7day
TN	0.85±0.007	0.844±0.025	0.815±0.01	0.992±0.177	0.838±0.014	0.843±0.054	0.801±0.019	2.519±0.984	10.324±1.637	26.069±4.210	28day
SOC	13.085±0.106	12.951±0.239	13.015±0.132	13.135±0.500	13.272±0.195	13.324±0.173	13.215±0.218	13.492±0.174	12.940±0.140	13.044±0.170	28day
C/N	15.396±0.163	15.373±0.238	15.974±0.176	14.463±2.270	15.862±0.437	15.976±0.868	16.509±0.206	9.227±3.410	1.357±0.224	0.540±0.085	28day
DOC	313.400±9.617	284.000±7.478	254.083±17.714	302.867±6.405	354.267±10.746	256.583±1.602	234.167±4.529	224.533±6.323	273.767±11.024	239.033±11.849	28day
DON	97.000±1.059	97.633±2.053	92.883±3.924	102.933±1.158	116.433±1.455	93.283±0.631	85.517±1.567	81.600±2.340	87.667±2.796	81.0167±3.331	28day
MBC	424.593±21.671	498.370±21.173	543.111±10.685	501.185±57.555	606.185±91.567	330.173±28.026	327.407±11.214	310.815±10.895	314.444±23.583	347.778±86.684	28day
MBN	48.642±5.144	37.037±5.452	53.827±0.630	74.012±33.369	66.975±21.406	73.827±25.979	57.963±34.404	10.617±2.744	30.617±6.723	36.543±7.029	28day
MC/N	9.026±1.107	14.481±2.352	10.100±0.310	11.545±5.696	11.246±2.387	7.123±2.833	11.574±3.670	45.336±21.676	11.613±2.371	11.209±3.898	28day
MBP	6.546±0.426	17.262±0.565	22.451±0.514	18.219±0.670	15.390±0.702	11.135±1.494	10.394±0.968	9.227±0.379	7.489±1.314	11.886±1.235	28day
MC/P	65.833±6.065	29.005±1.780	24.241±0.839	27.464±2.723	40.372±7.497	31.892±5.680	32.501±3.906	33.730±0.735	46.303±8.228	28.672±6.608	28day
MN/P	7.375±0.335	2.182±0.374	2.401±0.054	4.101±1.791	4.514±1.510	6.072±1.402	5.561±3.304	1.150±0.293	4.408±1.207	3.207±0.670	28day
TP	0.275±0.003	0.284±0.004	0.282±0.002	0.274±0.005	0.263±0.011	0.307±0.003	0.256±0.011	0.284±0.001	0.295±0.003	0.290±0.003	28day
C/P	47.542±0.720	45.684±1.385	46.113±0.642	48.045±2.476	50.798±2.398	43.483±1.017	52.087±3.273	47.571±0.630	43.798±0.049	44.994±0.419	28day
N/P	3.089±0.057	2.976±0.123	2.887±0.020	3.592±0.575	3.198±0.080	2.742±0.139	3.161±0.229	8.875±3.464	35.017±5.694	89.843±14.487	28day
AP	1.758±0.052	2.117±0.10	1.626±0.179	1.684±0.180	1.380±0.021	2.762±0.209	1.635±0.080	1.494±0.141	2.351±0.153	1.774±0.10	28day
NH ₄ ⁺	9.417±0.889	14.241±0.242	13.210±0.628	12.704±0.782	11.163±0.477	8.687±0.797	9.658±0.161	9.870±0.047	9.758±0.482	11.039±1.105	28day
NO ₃ ⁻	0.685±0.028	0.719±0.008	0.648±0.026	0.756±0.030	0.809±0.038	0.566±0.019	0.562±0.012	0.592±0.014	0.732±0.018	0.812±0.071	28day
BG/MBC	0.400±0.058	0.799±0.031	0.243±0.035	0.704±0.195	0.892±0.081	0.244±0.060	0.156±0.007	0.241±0.039	0.419±0.055	0.263±0.100	28day
CBH/MBC	0.053±0.002	0.181±0.005	0.066±0.002	0.099±0.013	0.258±0.045	0.017±0.002	0.018±0.002	0.103±0.006	0.204±0.020	0.067±0.021	28day
NAG/MBC	0.035±0.005	0.452±0.044	0.045±0.020	0.251±0.063	0.465±0.025	0.060±0.006	0.054±0.005	0.052±0.008	0.086±0.010	0.069±0.024	28day
LAP/MBC	0.048±0.008	0.017±0.002	0.242±0.011	0.005±0.003	0.008±0.002	0.124±0.004	0.108±0.004	0.147±0.012	0.122±0.004	0.164±0.052	28day
AP/MBC	1.448±0.117	0.841±0.056	1.043±0.043	0.892±0.096	0.891±0.207	1.694±0.290	1.659±0.045	1.586±0.156	1.542±0.380	1.730±0.583	28day
TN	0.901±0.007	0.877±0.013	0.861±0.011	0.872±0.007	0.899±0.013	0.871±0.009	0.864±0.010	0.885±0.016	0.840±0.008	0.865±0.015	98day
SOC	14.212±0.201	13.879±0.102	13.483±0.111	14.214±0.139	13.961±0.076	13.763±0.145	13.795±0.091	14.323±0.122	13.831±0.108	13.986±0.167	98day
C/N	15.768±0.163	15.836±0.132	15.668±0.094	16.314±0.237	15.549±0.280	15.797±0.067	15.984±0.247	16.213±0.388	16.466±0.225	16.181±0.218	98day
DOC	350.975±27.968	322.762±12.813	296.825±14.224	365.675±5.075	410.113±15.218	314.088±35.513	317.525±14.926	361.463±20.914	318.788±21.305	345.600±15.155	98day
DON	101.150±2.007	92.913±2.133	85.188±2.696	91.488±2.051	103.025±4.204	83.163±3.087	76.813±1.523	84.413±1.238	77.613±1.474	94.138±4.099	98day
MBC	672.296±57.824	681.778±56.198	702.667±62.951	516.445±94.851	551.111±143.495	696.593±18.167	759.333±55.986	722.667±36.083	673.111±52.840	1053.667±315.634	98day
MBN	108.519±11.401	112.593±16.324	98.889±3.698	49.074±14.147	141.389±76.560	85.185±4.455	76.852±8.952	81.482±8.644	73.827±7.146	127.160±41.065	98day
MC/N	6.269±0.455	6.299±0.584	7.071±0.408	11.864±1.580	9.411±2.672	8.226±0.367	10.087±0.650	9.030±0.560	9.281±0.804	8.513±0.469	98day
MBP	36.626±1.767	34.362±4.811	9.899±6.512	22.891±7.547	22.901±5.166	58.207±4.909	25.695±7.477	20.949±3.082	36.329±17.992	59.458±2.833	98day
MC/P	18.461±1.767	20.404±1.487	158.844±46.910	59.946±41.064	53.823±23.869	12.186±0.921	46.136±20.284	37.279±6.405	67.901±48.954	17.567±5.176	98day
MN/P	2.983±0.350	3.326±0.427	23.629±7.445	6.180±4.394	8.537±4.353	1.492±0.140	5.043±2.542	4.279±0.929	8.474±6.492	2.120±0.677	98day
TP	0.246±0.007	0.248±0.002	0.225±0.026	0.211±0.016	0.273±0.005	0.227±0.026	0.284±0.006	0.246±0.003	0.241±0.011	0.259±0.003	98day
C/P	57.946±1.231	55.871±0.442	62.610±8.043	68.309±4.592	51.231±0.965	63.904±9.323	48.705±1.212	58.146±0.907	57.848±2.796	54.121±1.093	98day
N/P	3.677±0.100	33.529±0.039	3.996±0.511	4.190±0.282	3.297±0.067	4.040±0.573	3.046±0.032	3.592±0.099	3.512±0.153	3.347±0.091	98day
AP	1.378±0.192	1.107±0.004	0.852±0.027	1.388±0.113	0.678±0.082	1.418±0.032	1.098±0.198	1.262±0.074	1.034±0.064	1.409±0.125	98day
NH ₄ ⁺	1.002±0.092	0.890±0.089	1.146±0.145	1.106±0.108	0.816±0.093	0.880±0.059	0.944±0.053	1.042±0.164	0.965±0.063	0.590±0.026	98day
NO ₃ ⁻	0.319±0.032	0.295±0.026	0.317±0.000	0.285±0.004	0.184±0.204	0.166±0.012	0.207±0.031	0.274±0.016	0.235±0.018	0.184±0.014	98day
BG/MBC	0.420±0.032	0.345±0.020	0.564±0.045	0.791±0.154	0.552±0.166	0.172±0.026	0.134±0.009	0.376±0.049	0.033±0.071	0.135±0.023	98day
CBH/MBC	0.125±0.009	0.082±0.011	0.271±0.019	0.420±0.082	0.378±0.100	0.017±0.004	0.016±0.002	0.091±0.018	0.124±0.025	0.033±0.007	98day
NAG/MBC	0.145±0.038	0.043±0.004	0.232±0.010	0.445±0.093	0.512±0.170	0.049±0.013	0.029±0.001	0.258±0.043	0.136±0.044	0.046±0.011	98day
LAP/MBC	0.099±0.004	0.085±0.009	0.037±0.002	0.049±0.011	0.023±0.009	0.100±0.010	0.094±0.010	0.099±0.010	0.224±0.032		