Supplemental Table 3. ANOVA of alpha-diversity metrics and beta-dispersion for stress subset with Tukey's post-hoc tests. ANOVA analyses for Shannon's diversity, richness, and beta-dispersion across stress subset including the factors Stress (which of the 8 stresses or control were considered), Substrate (which of the 3 substrates in this dataset), Replicate, and the interaction term Stress:Substrate, or by individual ModuleName (the specific stress x substrate module) and Replicate. These factors have to be run in separate ANOVA analyses due to the interdependence of factors Stress / Substrate and ModuleName. ANOVA calculations used the 'aov' function in the 'stats' package in R. Tukey's calculations used the 'HSD.test' function as part of the 'agricolae' package in R. Note: this subset does not include control soils, so as to focus on specific comparisons between stresses and the substrates used within this subset.

Shannon's Diversity by Stress x Substrate

Factor	Degrees of Freedom	Sum of Squares	Mean Squares	F Statistic	p-value	
Stress	8	11.691761	1.4614701	2.0682972	0.04570733	*
Substrate	2	6.644949	3.3224747	4.7020224	0.01113422	*
Replicate	6	4.903521	0.8172535	1.156591	0.33553979	
Stress:Substrate	16	10.076346	0.6297716	0.8912634	0.58077072	
Residuals	102	72.073757	0.7066055			

Shannon's Diversity by ModuleName

Factor	Degrees of Freedom	Sum of Squares	Mean Squares	F Statistic	p-value	
ModuleName	26	28.314722	1.0890278	1.541211	0.06616414	.
Replicate	6	5.001855	0.8336425	1.179785	0.32302886	
Residuals	102	72.073757	0.7066055			

Shannon's Diversity (by Stress) - Tukey's post-hoc tests

Stress	value	groups
10%C	1.9575387	a
late	1.7880318	a
heat	1.6515898	a
salt	1.5503691	a
control	1.5359458	a
pH8	1.5005037	a
light	1.377234	a
2,4-D	1.0762257	a
PEG	0.9838901	a

Shannon's Diversity (by Subtrate) - Tukey's post-hoc tests

Substrate	value	groups
xylan	1.682759	a
xylose	1.610749	ab
n-acetylglucosamine	1.180268	b

Shannon's Diversity (by ModuleName) - Tukey's post-hoc tests

ModuleName	value	groups
10%C_xylose	2.55783	a
late_xylan	2.2943745	ab
xylose	2.0680091	ab
salt_xylan	2.0258973	ab
xylan	1.8982978	ab
heat_xylan	1.8785432	ab
pH8_xylan	1.7240041	ab
10%C_n-acetylglucosa	1.7209537	ab
late_xylose	1.6800718	ab
heat_xylose	1.606175	ab
10%C_xylan	1.5938325	ab
light_xylan	1.4780847	ab
light_xylose	1.4741586	ab
heat_n-acetylglucosar	1.4700513	ab
PEG_xylose	1.4677898	ab
salt_xylose	1.4256398	ab
pH8_n-acetylglucosam	1.3989831	ab
late_n-acetylglucosam	1.3896492	ab
pH8_xylose	1.3785238	ab
2,4-D_xylan	1.2918247	ab
salt_n-acetylglucosam	1.1995701	ab
light_n-acetylglucosar	1.1794589	ab
2,4-D_n-acetylglucosa	1.0983121	ab
PEG_xylan	0.9599766	ab
2,4-D_xylose	0.8385404	ab
n-acetylglucosamine	0.6415306	ab
PEG_n-acetylglucosam	0.523904	b

Richness by Stress x Substrate

Factor	Degrees of Freedom	Sum of Squares	Mean Squares	F Statistic	p-value	
Stress	8	313065.33	39133.17	1.880985	0.07096913	.
Substrate	2	75883.24	37941.62	1.8237119	0.1666496	
Replicate	6	86339.18	14389.86	0.6916669	0.65682012	
Stress:Substrate	16	223739.23	13983.7	0.6721443	0.81497838	
Residuals	102	2122070.61	20804.61			

Richness by ModuleName

Factor	Degrees of Freedom	Sum of Squares	Mean Squares	F Statistic	p-value
ModuleName	26	595042	22886.23	1.1000555	0.3556944
Replicate	6	103985	17330.83	0.8330282	0.5471197
Residuals	102	2122071	20804.61		

Richness (by Stress) - Tukey's post-hoc tests

Stress	value	groups
salt	202.73333	a
2,4-D	89.6	ab
10%C	73.93333	ab
late	64.93333	ab
pH8	53.26667	ab
light	50.66667	ab
control	47.66667	ab
heat	47.33333	ab
PEG	34.06667	b

Richness (by Substrate) - Tukey's post-hoc tests

Substrate	value	groups
xylan	98.66667	a
xylose	80.84444	a
n-acetylglucosamine	41.88889	a

Richness (by ModuleName) - Tukey's post-hoc tests

ModuleName	value	groups
salt_xylose	280.4	a
salt_xylan	275.2	a
2,4-D_xylan	204.4	a
10%C_xylose	92.6	a
late_xylan	83.8	a
10%C_xylan	66.8	a
pH8_xylan	66.8	a
late_xylose	65.8	a
10%C_n-acetylglucosamine	62.4	a
xylose	60.2	a
xylan	59	a
pH8_xylose	55.6	a
light_xylan	55.2	a
light_xylose	54.2	a
salt_n-acetylglucosamine	52.6	a
heat_n-acetylglucosamine	51.8	a
heat_xylose	47	a
late_n-acetylglucosamine	45.2	a
heat_xylan	43.2	a
light_n-acetylglucosamine	42.6	a
PEG_xylose	41	a
pH8_n-acetylglucosamine	37.4	a
2,4-D_n-acetylglucosamine	33.6	a
PEG_xylan	33.6	a
2,4-D_xylose	30.8	a
PEG_n-acetylglucosamine	27.6	a
n-acetylglucosamine	23.8	a

Faith's PD by Stress x Substrate

Factor	Degrees of Freedom	Sum of Squares	Mean Squares	F Statistic	p-value	
Stress	8	6513.717	814.2147	2.5457469	0.0143238	*
Substrate	2	1339.45	669.725	2.0939813	0.1284603	
Replicate	6	1392.786	232.131	0.7257874	0.6298121	
Stress:Substrate	16	3662.243	228.8902	0.7156547	0.7723484	
Residuals	102	32622.997	319.8333			

Faith's PD by ModuleName

Factor	Degrees of Freedom	Sum of Squares	Mean Squares	F Statistic	p-value
ModuleName	26	11293.725	434.374	1.3581264	0.1420069
Replicate	6	1614.471	269.0785	0.8413087	0.5409283
Residuals	102	32622.997	319.8333		

Faith's PD (by Stress) - Tukey's post-hoc tests

Stress	value	groups
salt	28.62886	a
2,4-D	12.341872	ab
10%C	10.224346	ab
late	9.214669	ab
light	7.858116	b
pH8	7.140995	b
heat	6.798053	b
control	5.340764	b
PEG	3.951114	b

Faith's PD (by Substrate) - Tukey's post-hoc tests

Substrate	value	groups
xylan	13.828405	a
xylose	10.532364	a
n-acetylglucosamine	6.138827	a

Faith's PD (by ModuleName) - Tukey's post-hoc tests

ModuleName	value	groups
salt_xylan	39.194797	a
salt_xylose	37.245484	a
2,4-D_xylan	27.828453	a
late_xylan	11.907575	a
10%C_xylose	11.500579	a
10%C_xylan	10.487426	a
light_xylose	9.834703	a
salt_n-acetylglucosamine	9.446299	a
10%C_n-acetylglucosamine	8.685034	a
pH8_xylose	8.322625	a
light_xylan	8.081991	a
late_n-acetylglucosamine	7.944574	a
xylan	7.911596	a
late_xylose	7.791858	a
pH8_xylan	7.77859	a
heat_xylan	7.161245	a
heat_xylose	6.68275	a
heat_n-acetylglucosamine	6.550164	a
light_n-acetylglucosamine	5.657655	a
pH8_n-acetylglucosamine	5.321769	a
xylose	5.319765	a
2,4-D_n-acetylglucosamine	4.873736	a
2,4-D_xylose	4.323427	a
PEG_xylan	4.103975	a
PEG_n-acetylglucosamine	3.979283	a
PEG_xylose	3.770083	a
n-acetylglucosamine	2.790932	a

Weighted UniFrac Beta-Dispersion by Stress x Substrate

Factor	Degrees of Freedom	Sum of Squares	Mean Squares	F Statistic	p-value	
Stress	8	0.18705252	0.023381565	5.1082324	2.32E-05	***
Substrate	2	0.04889128	0.024445642	5.3407041	0.00622506	**
Replicate	6	0.08688816	0.01448136	3.163781	0.00690726	**
Stress:Substrate	16	0.06779635	0.004237272	0.9257281	0.542613	
Residuals	102	0.46687767	0.004577232			

Weighted UniFrac Beta-Dispersion by ModuleName

Factor	Degrees of Freedom	Sum of Squares	Mean Squares	F Statistic	p-value	
ModuleName	26	0.30487505	0.011725963	2.561802	4.29E-04	***
Replicate	6	0.08575327	0.014292212	3.122457	0.00752091	**
Residuals	102	0.46687767	0.004577232			

Weighted UniFrac Beta-Dispersion (by Stress) - Tukey's post-hoc tests

Stress	value	groups
salt	0.13558591	a
10%C	0.11664556	a
control	0.09714968	ab
late	0.0969968	ab
pH8	0.0788559	ab
light	0.07159997	ab
heat	0.05548898	ab
2,4-D	0.02515461	b
PEG	0.01802855	b

Weighted UniFrac Beta-Dispersion (by Substrate) - Tukey's post-hoc tests

Substrate	value	groups
xylan	0.10284022	a
xylose	0.07179021	ab
n-acetylglucosamine	0.05720489	b

Weighted UniFrac Beta-Dispersion (by ModuleName) - Tukey's post-hoc tests

ModuleName	BetaDisper	groups
10%C_xylan	0.191033205	a
xylan	0.155639327	ab
salt_xylan	0.145399226	ab
salt_xylose	0.143630581	ab
salt_n-acetylglucosamine	0.117727929	ab
light_xylose	0.116277571	ab
late_xylan	0.11615672	ab
pH8_xylan	0.095725837	ab
late_n-acetylglucosamine	0.092090331	ab
xylose	0.086558933	ab
pH8_n-acetylglucosamine	0.083804198	ab
late_xylose	0.082743357	ab
light_xylan	0.081804553	ab
10%C_xylose	0.0805482	ab
10%C_n-acetylglucosamine	0.078355272	ab
heat_xylan	0.069811351	ab
heat_xylose	0.059615044	ab
2,4-D_xylan	0.058577198	ab
pH8_xylose	0.057037678	ab
n-acetylglucosamine	0.049250765	ab
heat_n-acetylglucosamine	0.037040559	ab
PEG_n-acetylglucosamine	0.030161673	ab
light_n-acetylglucosamine	0.016717796	b
PEG_xylose	0.01250938	b
PEG_xylan	0.011414597	b
2,4-D_n-acetylglucosamine	0.009695457	b
2,4-D_xylose	0.007191175	b

Unweighted UniFrac Beta-Dispersion by Stress x Substrate

Factor	Degrees of Freedom	Sum of Squares	Mean Squares	F Statistic	p-value	
Stress	8	0.57830705	0.072288381	9.08897	2.33E-09	***
Substrate	2	0.02913335	0.014566677	1.831499	0.165	
Replicate	6	0.08039141	0.013398568	1.68463	0.132	
Stress:Substrate	16	0.18616653	0.011635408	1.462944	0.129	
Residuals	102	0.81124869	0.007953418			

Unweighted UniFrac Beta-Dispersion by ModuleName

Factor	Degrees of Freedom	Sum of Squares	Mean Squares	F Statistic	p-value	
ModuleName	26	0.79429792	0.03054992	3.841106	5.64E-07	***
Replicate	6	0.07970042	0.013283403	1.67015	0.1358799	
Residuals	102	0.81124869	0.007953418			

Unweighted UniFrac Beta-Dispersion (by Stress) - Tukey's post-hoc tests

Stress	value	groups
salt	0.4766595	a
2,4-D	0.3948245	ab
control	0.3252769	bc
pH8	0.3233761	bc
10%C	0.2952385	bc
heat	0.294555	bc
late	0.2826826	c
PEG	0.2780101	c
light	0.25526	c

Unweighted UniFrac Beta-Dispersion (by Substrate) - Tukey's post-hoc tests

Substrate	value	groups
xylan	0.3454179	a
n-acetylglucosamine	0.3186845	a
xylose	0.311192	a

Unweighted UniFrac Beta-Dispersion (by ModuleName) - Tukey's post-hoc tests

ModuleName	BetaDisper	groups
2,4-D_xylan	0.5121057	a
salt_xylan	0.5079299	a
salt_xylose	0.4955536	ab
salt_n-acetylglucosamine	0.4264949	abc
2,4-D_n-acetylglucosamine	0.3632508	abc
n-acetylglucosamine	0.3568762	abc
pH8_n-acetylglucosamine	0.3454876	abc
heat_xylose	0.3365939	abc
PEG_xylan	0.3252792	abc
xylan	0.3236727	abc
pH8_xylose	0.3184173	abc
10%C_xylan	0.3166579	abc
late_xylose	0.3125608	abc
2,4-D_xylose	0.3091171	abc
pH8_xylan	0.3062233	abc
heat_n-acetylglucosamine	0.3058527	abc
10%C_n-acetylglucosamine	0.3035968	abc
late_xylan	0.2981349	abc
xylose	0.2952819	abc
light_xylan	0.277539	bc
light_n-acetylglucosamine	0.2657729	c
10%C_xylose	0.2654608	c
PEG_n-acetylglucosamine	0.2634772	c
PEG_xylose	0.245274	c
heat_xylan	0.2412184	c
late_n-acetylglucosamine	0.237352	c
light_xylose	0.2224682	c