

Population Dynamics

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Calculations and Statistics

CCF analysis

Repeated Measures ANOVA (RMANOVA)

Table 1: RMANOVA table for SRIM8 phage between N-limited vs. P-limited environments. lim: nutrient limitation (nitrogen-limited [NL] or phosphorus-limited [PL]); day.fac: time in the experimental timecourse

	numDF	denDF	F-value	p-value
(Intercept)	1	230	16114	0
lim	1	4	0.359	0.5813
day.fac	58	230	10.22	0
lim:day.fac	58	230	2.588	2.771e-07

Table 2: RMANOVA table for +Ph *Synechococcus* between N-limited and P-limited environments

	numDF	denDF	F-value	p-value
(Intercept)	1	245	8342	0
lim	1	4	0.1678	0.7031
day.fac	62	245	3.443	3.889e-12
lim:day.fac	62	245	2.428	7.777e-07

Table 3: RMANOVA table comparison between -Ph and +Ph N-limited *Synechococcus*. day.fac: time in experimental timecourse; type: *Synechococcus* exposure to phage [control, treatment]

	numDF	denDF	F-value	p-value
(Intercept)	1	123	11512	0
day.fac	62	123	3.673	4.008e-10
type	1	2	2.563	0.2505
day.fac:type	62	123	1.526	0.02413

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Table 4: RMANOVA table comparison between -Ph and +Ph P-limited *Synechococcus*. day.fac: time in experimental timecourse; type: *Synechococcus* exposure to phage [control, treatment]

	numDF	denDF	F-value	p-value
(Intercept)	1	182	7906	0
day.fac	62	182	2.207	2.575e-05
type	1	3	4.784	0.1166
day.fac:type	62	182	0.9614	0.5613

Table 5: RMANOVA for -Ph *Synechococcus* in N-limited vs. P-limited environments

	numDF	denDF	F-value	p-value
(Intercept)	1	60	1629	0
lim	1	1	0.01077	0.9342
day.fac	62	60	0.9176	0.6315
lim:day.fac	62	60	0.9089	0.6454

Stability (1/CV) and associated tables

Table 6: Average population density and stability by treatment

Limitation	Treatment	Synechococcus mean densitiy (+/- SEM)	Synechococcus mean stability	Phage mean density (+/- SEM)	Phage mean stability
N	Control	1.3e+07(4e+06)	33	NaN(NA)	NA
N	Infect	1.7e+07(1e+07)	8.8	2.5e+08(1.4e+08)	15
P	Control	1.8e+07(9e+06)	20	NaN(NA)	NA
P	Infect	1.1e+07(1e+07)	11	2.4e+08(9.5e+07)	20

Table 7: Average population density and stability by chemostat

Chemostat	Treatment	Synechococcus mean densitiy (+/- SEM)	Synechococcus mean stability	Phage mean density (+/- SEM)	Phage mean stability
NL1	Control	1.3e+07(4e+06)	33	NaN(NA)	NA
NL2	Infect	1.8e+07(1e+07)	8	1.5e+08(7.9e+07)	14
NL3	Infect	1.6e+07(1e+07)	10	2.9e+08(1.5e+08)	17
NL5	Infect	1.7e+07(2e+07)	8.8	3.1e+08(1.6e+08)	18
PL1	Control	2.5e+07(1e+07)	30	NaN(NA)	NA
PL2	Infect	1.3e+07(1e+07)	11	1.6e+08(5.9e+07)	22
PL3	Control	9864044(4e+06)	21	NaN(NA)	NA
PL4	Infect	1.1e+07(7e+06)	11	2.4e+08(8.8e+07)	21
PL5	Infect	9399556(1e+07)	12	3.1e+08(1.1e+08)	20

Topographic statistics and associated tables

Table 8: Descriptive statistical summary of population data. (continued below)

lim	cID	microbe	mean	var	sem	stab	start.abd
N	NL2	Phage	151575375	1.881e+16	79190498	13.53	2102121
N	NL3	Phage	292205382	6.38e+16	145831435	16.55	2362910
N	NL5	Phage	312565642	7.765e+16	160881119	17.79	2299688
P	PL2	Phage	161267374	1.047e+16	59073946	22.24	2102121
P	PL4	Phage	243403403	2.342e+16	88361764	21.33	2299688
P	PL5	Phage	312523940	3.66e+16	110450827	20.25	1841331
N	NL2	Syn	17594096	4.371e+14	12070003	7.99	9599786
N	NL3	Syn	16110168	3.023e+14	10039048	9.962	22353787
N	NL5	Syn	16985817	8.152e+14	16484799	8.775	23186422
P	PL2	Syn	12944893	6.116e+14	14277915	11	42190080
P	PL4	Syn	10812795	1.329e+14	6655700	10.77	31571541
P	PL5	Syn	9399556	3.232e+14	10380093	11.54	9874066

final.abd	min.day	min.abd	max.day	max.abd
157137459	72	1422488	16	573074216
261895765	2	2362910	30	940323547
378381691	2	2299688	30	1.029e+09
237940680	2	2102121	32	659870095
378302664	2	2299688	146	7.46e+08
5.74e+08	2	1841331	21	859404750
20629744	23	93339	98	84902597
17710626	44	300299	100	80035767
1.82e+08	39	117089	166	1.82e+08
74192632	79	496642	146	153895345
19439567	63	297912	146	52700866
111891383	93	393297	166	111891383

Table 10: t-test summary for population mean and stability of +Ph Synechococcus and phage

microbe	analysis	t	df	pvalue
syn	mean	-5.233	4	0.006
syn	stability	3.563	4	0.024
phage	mean	-0.195	4	0.855
phage	stability	3.831	4	0.019

Figures

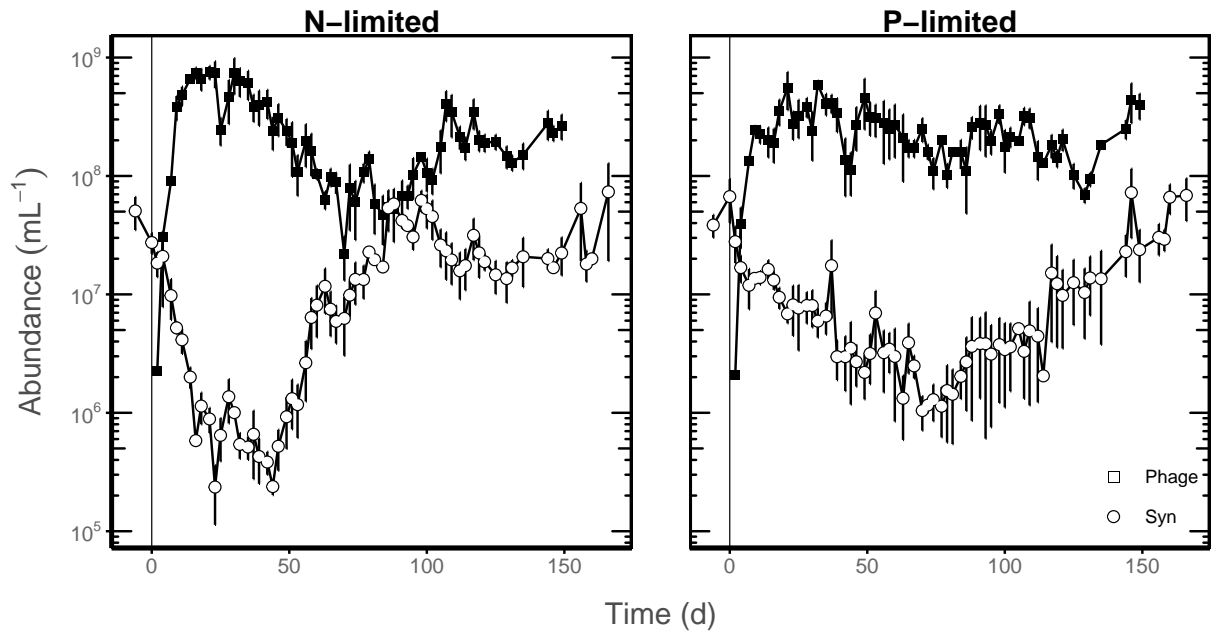


Figure 1: Fig1: Average Synechococcus and phage population dynamics in N-limited and P-limited treatment chemostats

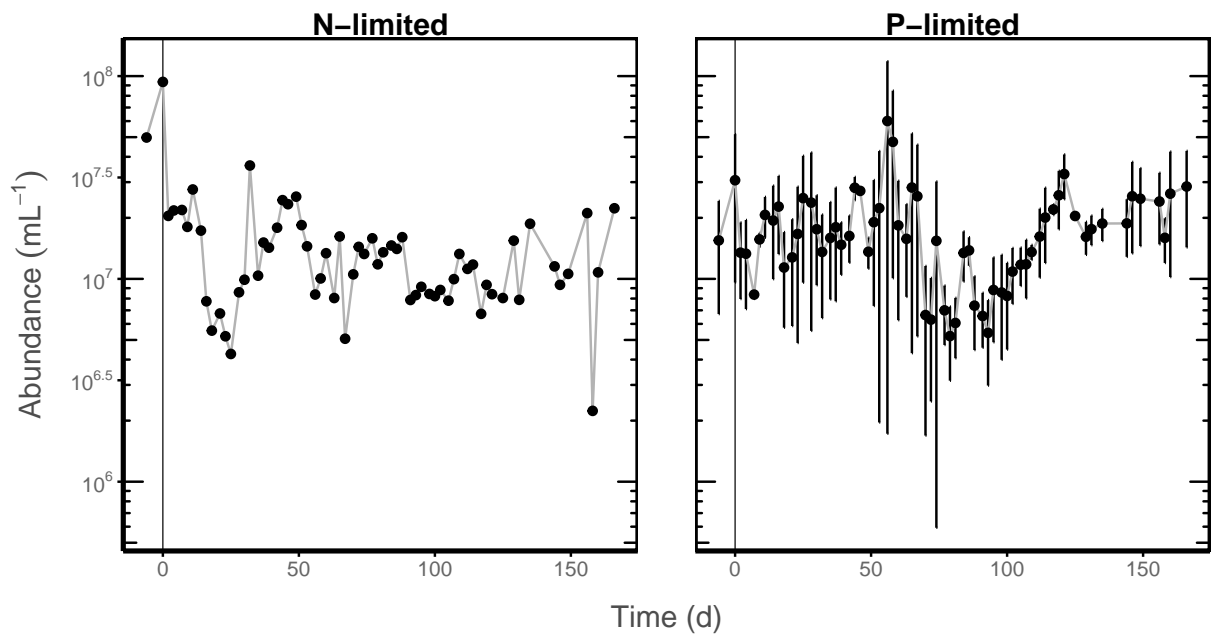


Figure 2: FigS2: Average population dynamics for N-limited and P-limited control chemostats