

Differential effects of grazer species on periphyton of a temperate rocky shore

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Supplement 1. Quantification of grazer per capita and per biomass effects on periphyton production, richness and diversity (Table S1) estimated through experimental manipulation of grazer identity in the field

Estimation of per capita and per biomass effect of different grazers on periphyton. In order to quantify per capita and per biomass (g) effects of each grazer species on periphyton productivity (biomass estimated through acrylic plates), taxa richness and diversity estimated through experimental plot sampling, we used the ‘Dynamic Index’ (DI), which is recommended when resources exhibit positive exponential growth (Berlow et al. 1999) as during early succession. The index was calculated as:

$$DI = [\ln (Cov_{EN}/Cov_{EX})]/(N, B \times t) \quad \text{Eq (S1)}$$

where Cov_{EN} is the specific periphyton biomass, richness and diversity observed in the herbivore enclosures, Cov_{EX} is the periphyton in the grazer exclusions, N, B is the density and biomass (g) of herbivores, respectively, in the experimental plots and t is the elapsed time of experiments, in this case in days. Confidence intervals (95%) for effects estimates were obtained through a bootstrapping procedure (Manly 1997). It should be noted that non-significant values (95% CI crossing zero) are not different from grazer exclusion treatment.

Table S1. Per capita and per body mass (g) effects of grazer species on periphyton taxa richness and diversity recorded inside experimental plots in the field. 95% CI were estimated through bootstrapping procedure. Those values with 95% CI crossing zero (i.e. with negative and positive values) are not significantly different from grazer exclusion plots

Grazer species	Per capita (no. of species ind. ⁻¹ d ⁻¹)	95% CI (Bootstrapped)	Per body mass (no. of species g ⁻¹ d ⁻¹)	95% CI (Bootstrapped)
Richness				
<i>S. araucana</i>	0.0254	0.0102: 0.0405	0.0124	0.00043: 0.0220
<i>S. lessoni</i>	0.0113	0.0062: 0.0163	0.0451	0.0237: 0.0666
<i>F. crassa</i>	0.0424	0.0121: 0.0727	0.0009	0.0002: 0.0016
<i>C. granosus</i>	-0.0037	-0.0113: 0.0001	-0.0006	-0.0018: 0.0006
Diversity				
<i>S. araucana</i>	0.0101	0.0012: 0.0190	0.0052	0.0015: 0.0107
<i>S. lessoni</i>	0.0054	0.0031: 0.0077	0.0216	0.0117: 0.0315
<i>F. crassa</i>	0.0181	0.0041: 0.0320	0.0004	0.00007: 0.0006
<i>C. granosus</i>	-0.0181	0.0053: 0.0017	-0.0003	-0.0008: 0.0003

LITERATURE CITED

- Berlow E, Navarrete SA, Briggs C, Power M, Menge BA (1999) Quantifying variation in strengths of species interactions. *Ecology* 80:2206–2224
- Manly BFJ (1997) Randomization, bootstrap and Monte Carlo methods in biology. Chapman & Hall, Boca Raton, FL

Supplement 2.

Indirect effects of grazer identity on periphyton taxa diversity and richness measures through their effects on bare rock cover and ulvoid algae. We fit both polynomial quadratic and linear regression on each periphyton taxa diversity and richness, which were previously found to be significant when all grazer species were considered (see Table 4 in main text), and then recalculate these measures without the species *Chiton granosus* (Table S2) which was the only species with negative effects on periphyton productivity, overall taxa richness and diversity.

Table S2. Summary of polynomial quadratic and linear regression analyses on periphyton taxa diversity (H') and richness (S), using bare rock and ulvoid cover as predictor variables (x), without the species *Chiton granosus*. * $p < 0.05$. ↓ Arrow indicates loss of significance from previous condition when overall grazers were considered for analyses. **nc**: no change

Quadratic	y_0	a	b	R^2
Bare rock (%) (x)				
y Diatoms H'	1.18	0.010	-1.748×10^{-4}	0.1548 ↓
Ulvoids (%) (x)				
y Diatoms S	4.428	0.166	-0.002	0.251 ↓
Cyanophytes H'	0.345	0.014	-1.644×10^{-4}	0.366* nc
Cyanophytes S	0.975	0.124	-0.001	0.415* ↓
Linear	y_0	a		R^2
Bare rock (%) (x)				
y Diatoms H'	1.25	-0.003		0.013 ↓