

SUPPLEMENTARY MATERIALS

Nitrogen and phosphorus uptake rates of different species from a coral reef community after a nutrient pulse

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Supplementary figure S1

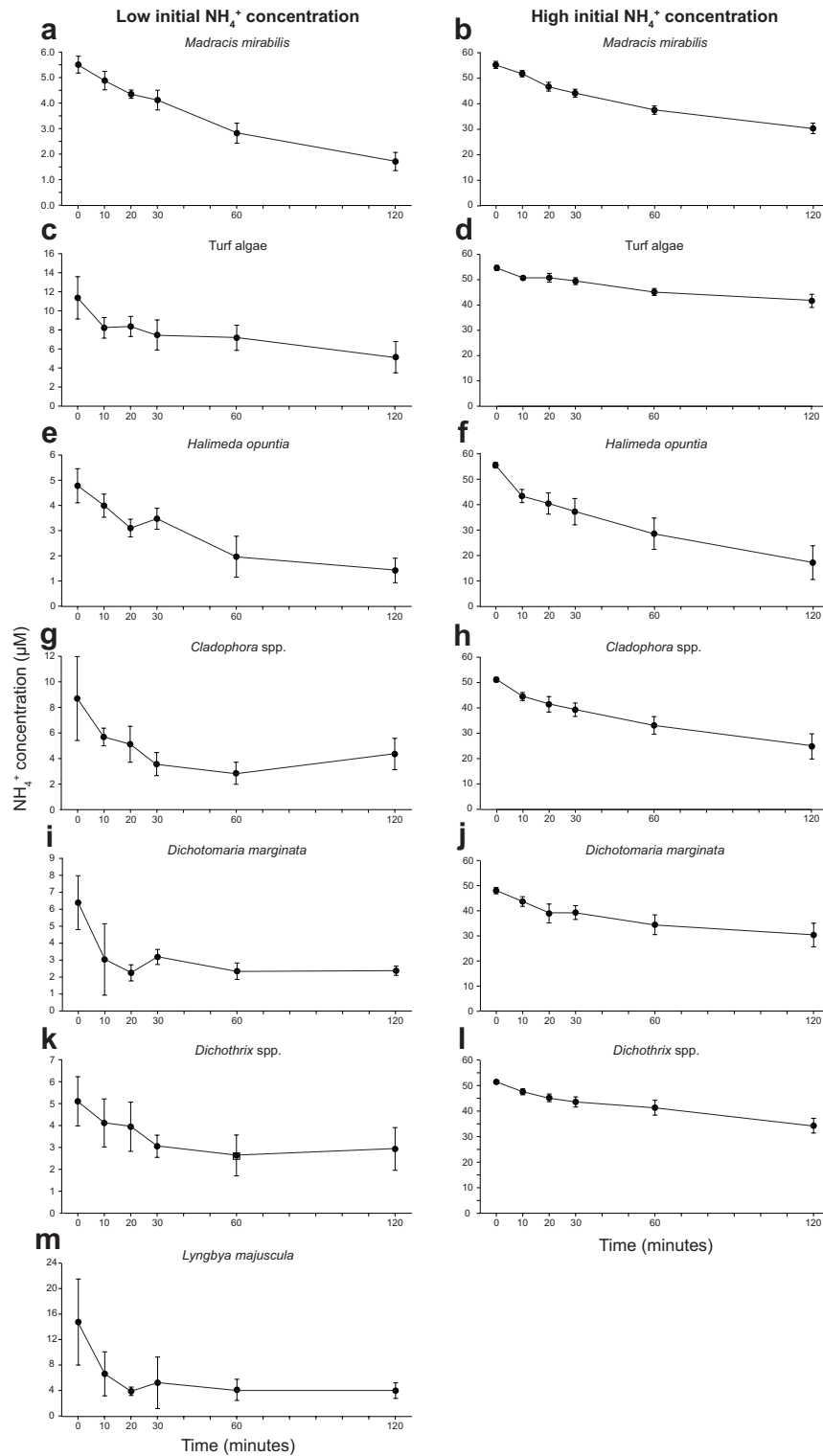


Figure S1. Decrease of NH_4^+ concentrations in the incubation water due to NH_4^+ uptake by benthic reef organisms from 5 m depth: (a,b) the coral *Madracis mirabilis*, (c,d) turf algae, (e,f) the macroalgae *Halimeda opuntia*, (g,h) *Cladophora* spp. and (i,j) *Dichotomaria marginata*, and (k,l) the benthic cyanobacteria *Dichothrix* spp., and (m) *Lyngbya majuscula*. The species were incubated at low (left column) and at high (right column) initial NH_4^+ concentrations. Error bars represent s.d. of the mean (n=9).

Supplementary figure S2

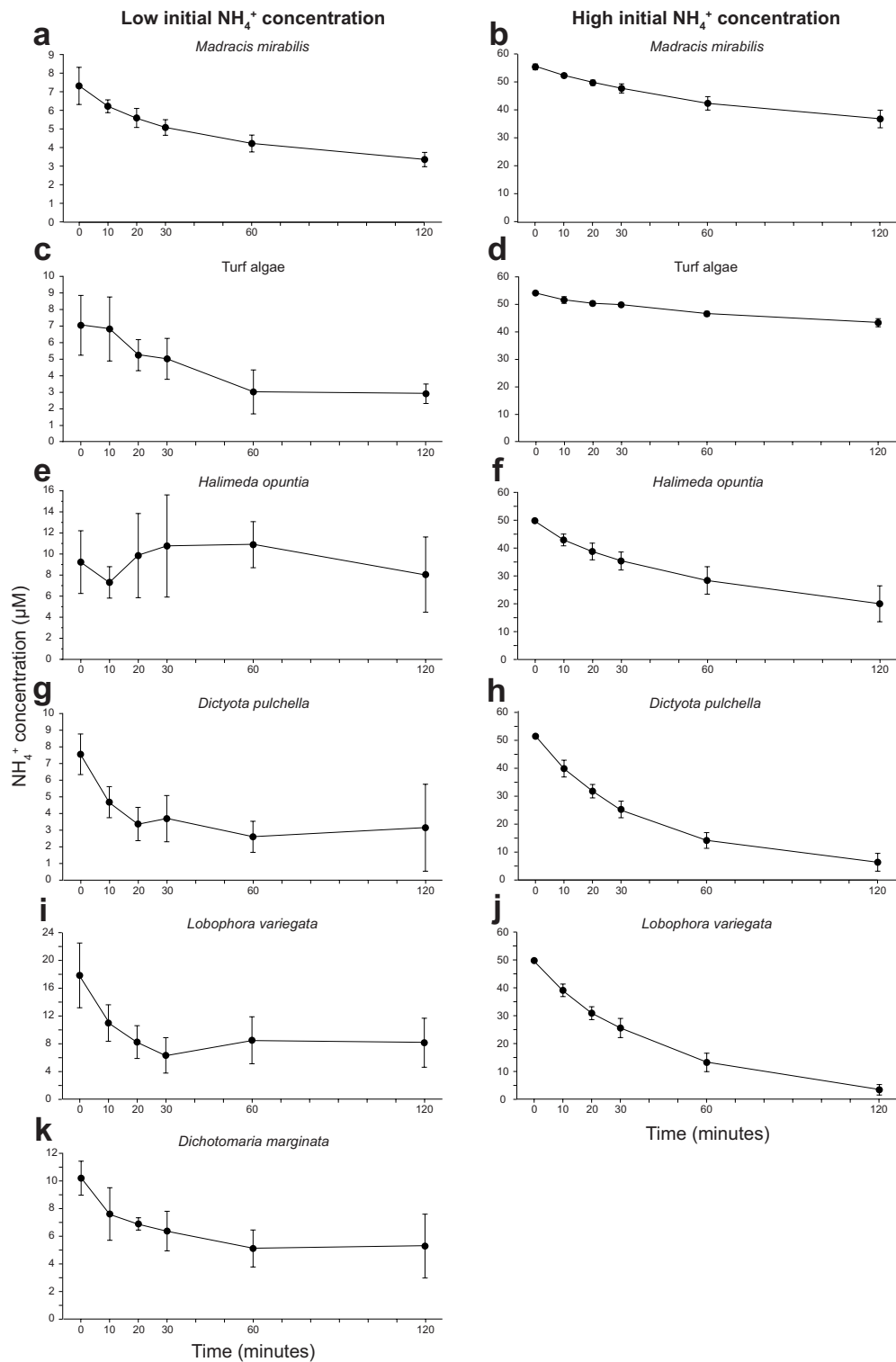


Figure S2. Decrease of NH_4^+ concentrations in the incubation water due to NH_4^+ uptake by benthic reef organisms from 20 m depth: (a,b) the coral *Madracis mirabilis*, (c,d) turf algae, (e,f) the macroalgae *Halimeda opuntia*, (g,h) *Dictyota pulchella*, (i,j) *Lobophora variegata*, and (k) *Dichotomaria marginata*. The species were incubated at low (left column) and at high (right column) initial NH_4^+ concentrations. Error bars represent s.d. of the mean (n=9).

Supplementary figure S3

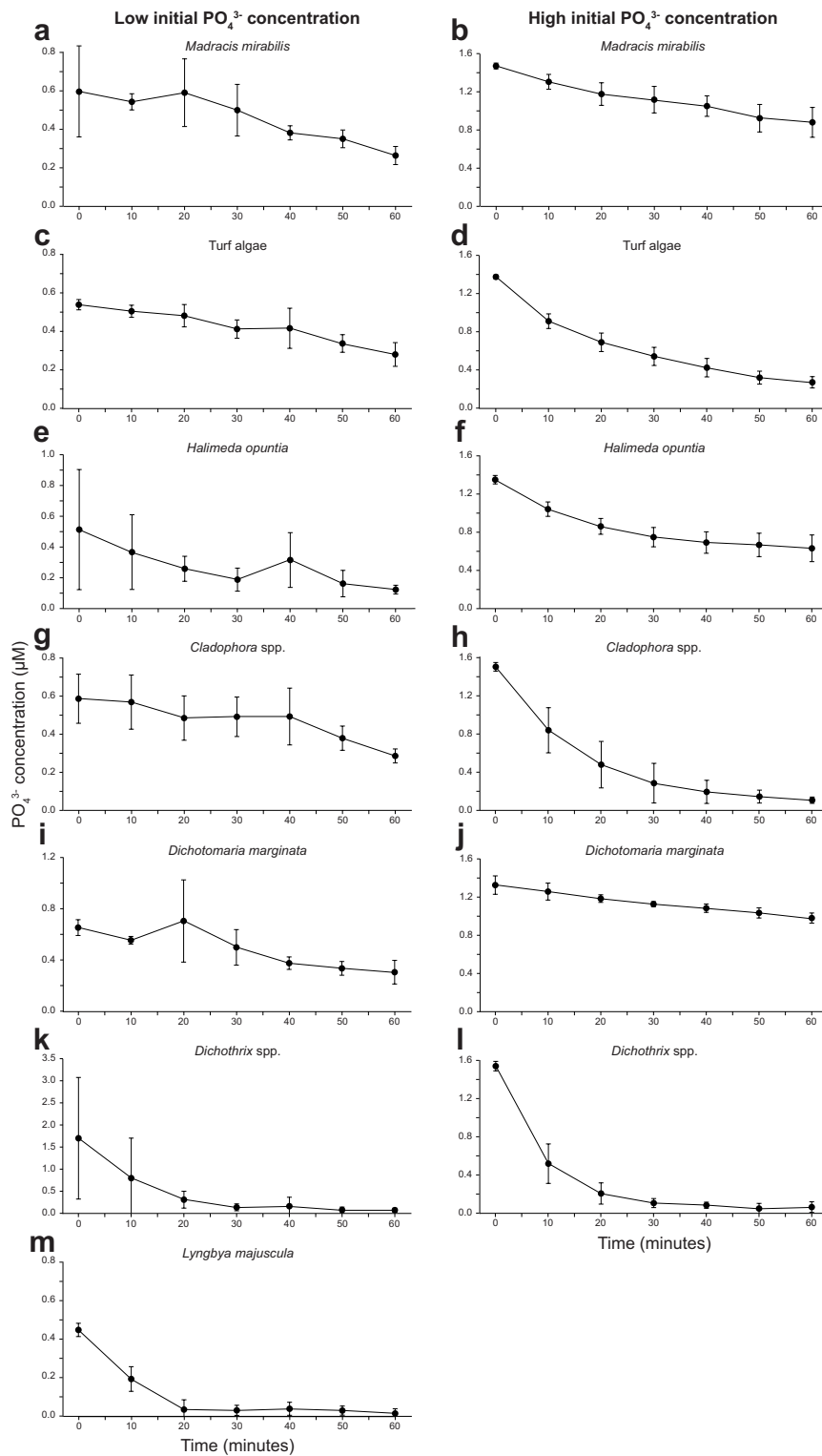


Figure S3. Decrease of PO_4^{3-} concentrations in the incubation water due to PO_4^{3-} uptake by benthic reef organisms from 5 m depth: (a,b) the coral *Madracis mirabilis*, (c,d) turf algae, (e,f) the macroalgae *Halimeda opuntia*, (g,h) *Cladophora* spp. and (i,j) *Dichotomaria marginata*, and (k,l) the benthic cyanobacteria *Dichothrix* spp., and (m) *Lyngbya majuscula*. The species were incubated at low (left column) and at high (right column) initial PO_4^{3-} concentrations. Error bars represent s.d. of the mean ($n=9$).

Supplementary figure S4

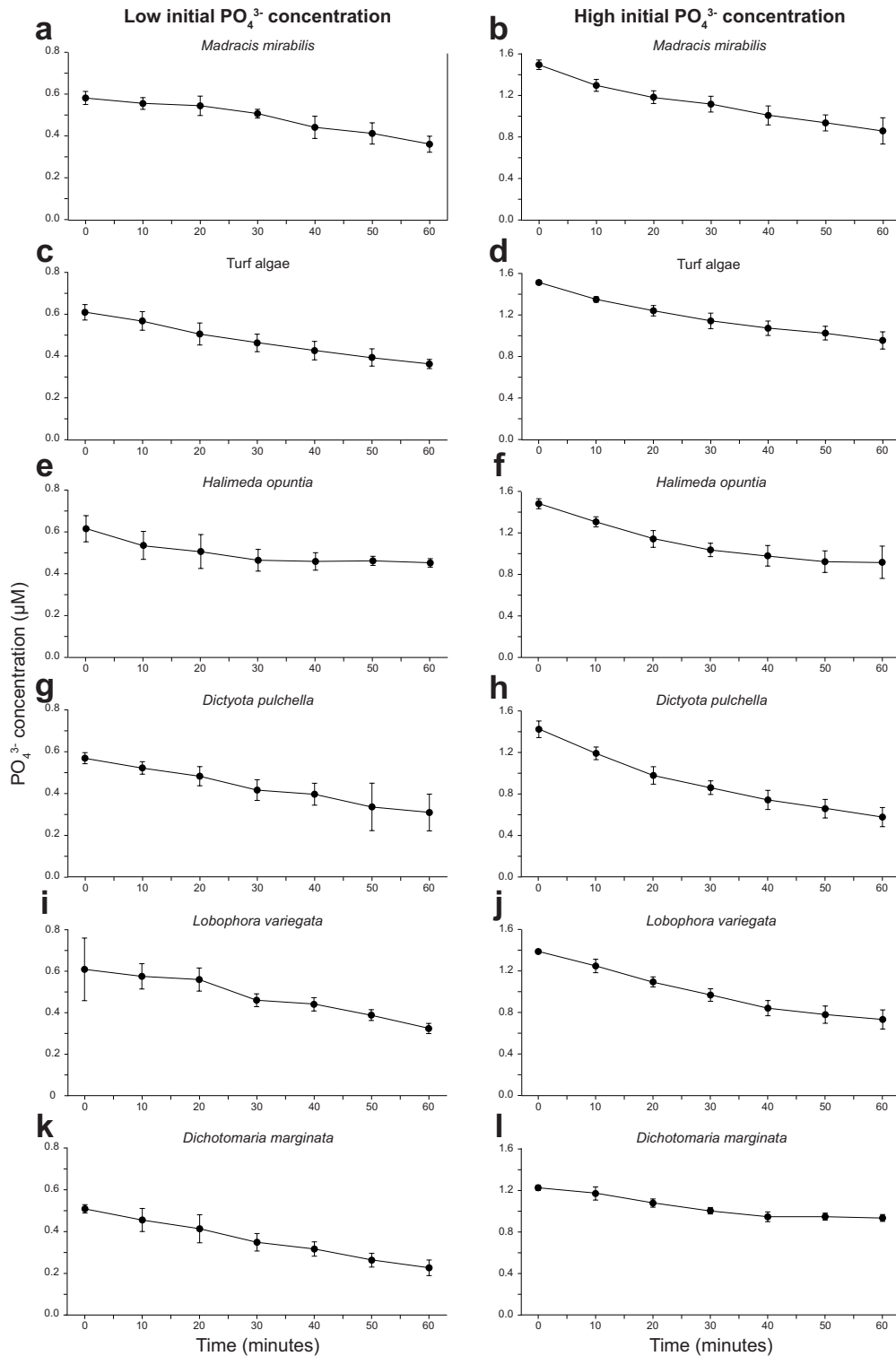


Figure S4. Decrease of PO_4^{3-} concentrations in the incubation water due to PO_4^{3-} uptake by benthic reef organisms from 20 m depth: (a,b) the coral *Madracis mirabilis*, (c,d) turf algae, (e,f) the macroalgae *Halimeda opuntia*, (g,h) *Dictyota pulchella*, (i,j) *Lobophora variegata*, and (k,l) *Dichotomaria marginata*. The species were incubated at low (left column) and at high (right column) initial PO_4^{3-} concentrations. Error bars represent s.d. of the mean (n=9).

Supplementary figure S5

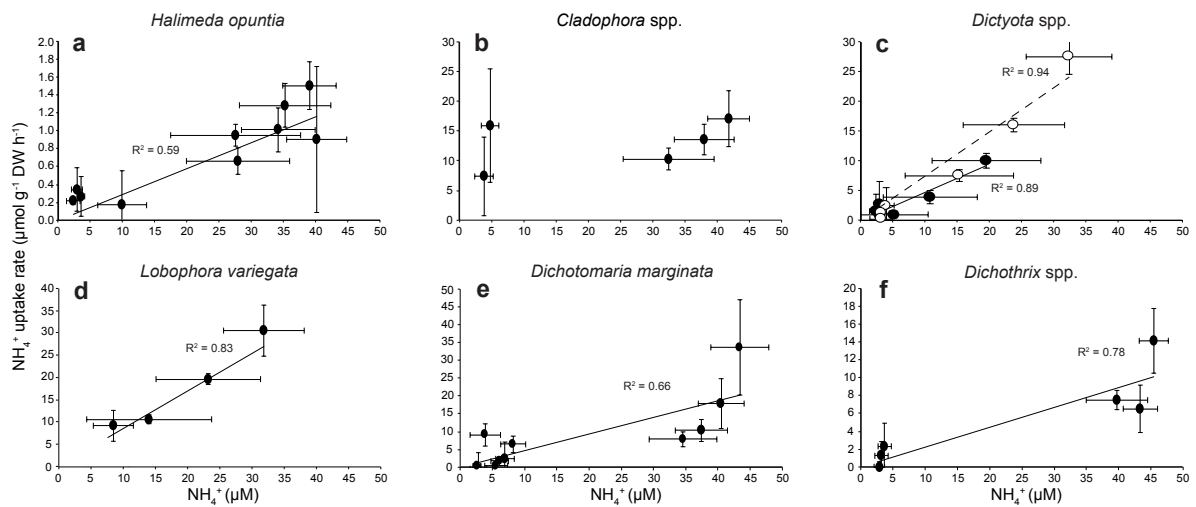


Figure S5. NH_4^+ uptake rates of the different species as function of the external NH_4^+ concentration. NH_4^+ uptake rates were calculated over 20 min time intervals during the nutrient uptake experiments. For those species with a biphasic NH_4^+ uptake, the first 10 min of the uptake experiments were not included. Data included specimens collected from both 5 and 20 m depth, and from uptake experiments performed at both low and high initial NH_4^+ concentrations. In (c), data for both *Dictyota menstrualis* (closed circles with solid trend line) and *Dictyota pulchella* (open circles with dashed trend line) are shown. Trend lines are based on linear regression forced through the origin, and are only shown if the regression was significant ($P < 0.05$). Error bars represent s.d. of the mean ($n=9$)

Supplementary figure S6

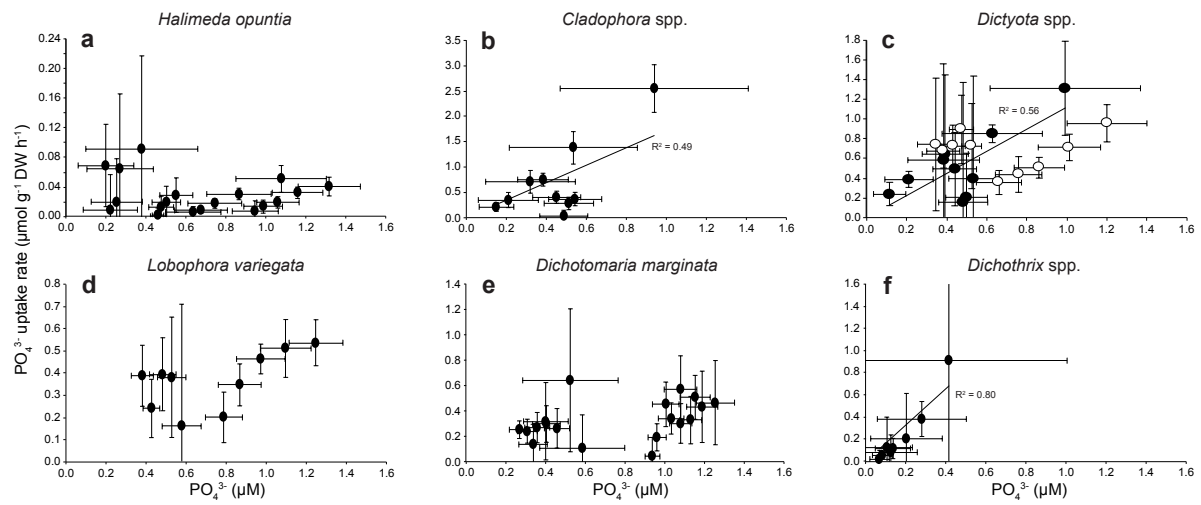


Figure S6. PO_4^{3-} uptake rates of the different species as function of the external PO_4^{3-} concentration. PO_4^{3-} uptake rates were calculated over 20 min time intervals during the nutrient uptake experiments. For those species with a biphasic PO_4^{3-} uptake, the first 10 min of the uptake experiments were not included. Data included specimens collected from both 5 and 20 m depth, and uptake experiments performed at both low and high initial PO_4^{3-} concentrations. In (c), data for both *Dictyota menstrualis* (closed circles with solid trend line) and *Dictyota pulchella* (open circles) are shown. Trend lines are based on linear regression forced through the origin, and are only shown if the regression was significant ($P < 0.05$). Error bars represent s.d. of the mean (n=9)

Supplementary Table S1

Table S1. Comparison of nutrient uptake rates (for NH_4^+ and PO_4^{3-}) between the initial time interval t_0 - t_{10} and the subsequent time interval t_{10} - t_{20} using paired sample t -tests. For each species, nutrient uptake rates were obtained from 9 replicate time series at 5 and/or 20 m depth and for high and low nutrient concentration treatments. Significant results ($P < 0.05$) are indicated in bold.

Species	NH_4^+			PO_4^{3-}		
	t	df	P	t	df	P
Turf algae	3.743	33	<0.001	3.176	31	0.003
<i>Lobophora variegata</i>	3.320	16	0.004	0.102	15	0.920
<i>Cladophora</i> spp.	4.075	16	<0.001	1.324	17	0.203
<i>Dichotomaria marginata</i>	1.619	26	0.118	0.921	35	0.363
<i>Halimeda opuntia</i>	4.869	33	<0.001	2.015	31	0.053
<i>Dictyota menstrualis</i>	2.954	16	0.009	1.007	15	0.330
<i>Dictyota pulchella</i>	2.408	16	0.028	1.889	17	0.076
<i>Lyngbya majuscula</i>	5.418	25	<0.001	4.972	26	<0.001
<i>Dichothrix</i> spp.	2.502	16	0.024	2.322	17	0.033
<i>Madracis mirabilis</i>	-0.892	33	0.379	0.605	35	0.549

Supplementary Table S2

Table S2. Areal density (i.e., dry weight per unit of area) of the different benthic species. The areal densities assume that the 1 m^2 reef area is completely covered by the benthic organism (100%) and takes the 3-D structure of the reef and organism into account. \pm represents s.e.m.

Benthic species	Depth (m)	Areal density (g DW m^{-2})
Hard corals	5	3065
	20	1961
Turf algae	5	127 ± 13.9
	20	68 ± 3.4
<i>Halimeda opuntia</i>	5	2590 ± 12.1
	20	2590 ± 12.1
<i>Dictyota menstrualis</i>	5	70 ± 0.9
<i>Dictyota pulchella</i>	20	70 ± 0.9
<i>Lobophora variegata</i>	20	100 ± 1.1
Cyanobacterial mats	5	11.1 ± 1.9
	20	6.2 ± 1.4