Pulse feeding with nitrate and phosphate in relation to tissue composition and nutrient uptake by some macroalgae from the Red Sea at Ghardaqa (Egypt)

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Abstract

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This investigation aimed at determining the effects of experimental enrichment with either N or P or both elements on the tissue nutrient levels, and on the internal N: P molar ratios of three macroalgal species collected in the vicinity of Ghardaqa, Red Sea, Egypt

The results obtained showed that the rates of nutrient (nitrate and phosphate) uptake were highly species dependent. Uptake rates of both nutrients were significantly higher for *Codium* than for either *Dictyota* or *Galaxaura*. For the three algae, uptake, except nitrate by*Galaxaura*, was rapid during the first 6 h of immersion and declined during the rest of the experiment. The observed increases in N levels after 6 h of enrichment decreased sharply after 24 h of enrichment. The fluctuations in tissue-N were accompanied by fluctuations in protein levels. Total carbohydrate content of the three macroalgae was decreased in seawater treatments enriched with either N or N+P for 24 h compared with non-enriched plants or plants enriched with P only. For the three macroalgae, enrichment with P resulted in consistent increases in tissue-P levels over the experimental period. The changes in the N:P ratios of the three plants were significantly correlated with the increases in tissue -P as compared to tissue -N. *G. rugosa* appeared to be the most strongly nutrient - limited of the three algal species studied and *D. dichotoma* was the least.

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