



Nitrogen (^{15}N) retention in small *Thalassia hemprichii* seagrass plots in an offshore meadow in South Sulawesi, Indonesia

Stapel, Johan, Marten A. Hemminga, Cornelis G. Bogert, Yvonne E. M. Maas

Limnol. Oceanogr., 46(1), 2001, 24-37 | DOI: 10.4319/lo.2001.46.1.0024

ABSTRACT: Nitrogen retention was investigated during 240 d in 1 X 1 m field plots of the tropical seagrass *Thalassia hemprichii*. Shoots were enriched with ^{15}N by brief exposure of the leaves to an elevated concentration of ^{15}N ammonium in the water column. Hereafter, the ^{15}N absorbed in the seagrass system declined rapidly. The decline was initially dominated by the loss of ^{15}N in detached leaf fragments. Of the lost leaf fragments, 19% were recovered within the boundaries of the experimental plots, and 25% were deposited outside these boundaries but inside the seagrass meadow. Of the remaining 56%, the fate could not be resolved, but export from the meadow is probably limited to ~10%. During the course of time, the ^{15}N half-life increased from 1 to ~2 months because of ^{15}N accumulation in compartments from which it was not easily exported (roots, rhizomes, and sedimentary detritus). The limited nitrogen retention in the seagrass plots is ascribed to the combined effects of a major allocation of nitrogen to leaf production, restricted nitrogen resorption from senescent leaves (28% of the gross N demand), and a dynamic environment facilitating detachment and export of leaf fragments from the experimental plots. At the scale of the whole meadow, however, nitrogen conservation via the detrital pathway could be of considerable significance. We found indications for a rather efficient reabsorption by the plant of nitrogen regenerated from seagrass leaf litter, with a meaningful role for the leaves, and postulate that increasing patch size may coincide with increasing nitrogen conservation in the system as a whole.

Article Links

[Download Full-text PDF](#)

[Return to Table of Contents](#)

Please Note

Articles in L&O appear in PDF format. Open access articles may be freely downloaded by anyone. Other articles are available for download to subscribers only, or may be purchased for \$10 per article. All L&O articles are moved into Open Access after three years.

