Geophysical Research Abstracts, Vol. 7, 04961, 2005
SRef-ID: 1607-7962/gra/EGU05-A-04961

δ^{15}N of fresh and detrital phytoplankton in a tidal estuary as calculated from δ^{15}N of ammonium

L. De Brabandere, N. Brion, F. Dehairs and W. Baeyens

Laboratory of Analytical and Environmental Chemistry, Vrije Universiteit Brussel, Belgium (ldebraba@vub.ac.be / Fax: +32 2-6293274 / Phone: +32 2-6293264)

Stable N isotopes are frequently used to assess seasonal variation in the trophic levels of aquatic consumers. This requires a thorough investigation of the variability of the δ^{15}N signature of the organisms at the base of the food web. However, since suspended matter is usually a mixture of terrestrial detritus, sewage, phytoplankton and microzooplankton, δ^{15}N signatures of the primary producers are difficult to assess.

Since for estuaries under anthropogenic stress NH_4^+ will often be the main nutrient assimilated by the primary producer community, the NH_4^+ δ^{15}N can be used as an efficient proxy of the δ^{15}N of primary producers. We measured the seasonal evolution of δ^{15}N signatures of NH_4^+ and calculated the *in situ* isotopic fractionation for NH_4^+ taking into account assimilation and nitrification. Then, we compared the calculated seasonal pattern of δ^{15}N of phytoplankton with the δ^{15}N pattern of copepods to assess the relative importance of phytoplankton in the diet of copepods. In addition, we show that the increase in the δ^{15}N signature of SPOM in eutrophic estuaries relative to pristine systems is mediated through the phytoplankton community and related to the intensity of NH_4^+ consumption processes enriching the δ^{15}N of NH_4^+.