

Diatom 22: 56-60 (英文)

阿部信一郎¹・鹿間俊夫²・北村章二³ : 付着珪藻群落の増殖における窒素飽和濃度

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Shin-ichiro Abe¹, Toshio Shikama² and Shoji Kitamura³ : Nitrogen concentration saturating the growth of lotic benthic diatom assemblages

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Abstract

Effects of nitrogen on biomass accrual of benthic diatom assemblages were examined using indoor artificial streams supplied with spring water ($\text{NO}_3\text{-N}$, 0.306 mg/l ; $\text{PO}_4\text{-P}$, 0.075 mg/l ; SiO_2 , 35.3 mg/l ; pH 7.4 ; conductivity, 148 $\mu\text{S/cm}$) from the source of the Jigoku River, Nikko City, Japan. We manipulated the $\text{NO}_3\text{-N}$ concentration in the artificial streams at 0.306, 0.781, 1.586 and 2.349 mg/l and investigated the temporal pattern of the biomass accrual in each stream to estimate the intrinsic growth rate and maximum biomass using the logistic growth equation. The results showed that there were no significant differences in the intrinsic growth rate and maximum biomass between the streams at the four different $\text{NO}_3\text{-N}$ concentrations. As the concentration of phosphorus in spring water was greater than the concentration saturating benthic algal growth (0.025~0.050 mg/l), the ambient nitrogen concentration of 0.3 mg/l is already growth-saturating for lotic benthic diatom assemblages.

Key index words : benthic diatoms, biomass accrual, intrinsic growth rate, maximum biomass, nitrogen