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Less is better: Uncorrected versus pheopigment-corrected photometric chlorophyll-a estimation

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With 3 figures and 1 table

Abstract: Photometric determinations of uncorrected and pheophytin-corrected chlorophyll-a concentrations were compared with HPLC-determinations. All determinations were based on the same water samples, which were taken during a two-year survey of seven lakes with varying trophy and morphology.

Uncorrected and pheophytin-corrected chlorophyll-a concentrations determined from the same samples differed significantly. Furthermore, pheophytin-corrected chlorophyll-a concentrations differed significantly from the HPLC-determinations, whereas the uncorrected photometric measurements did not differ. In addition, measurements of the same samples with different photometers, showed a significantly increased variation for the pheophytin-corrected chlorophyll-a concentrations.

The presented data suggest the abandonment of the acidification of sample extracts resp. the determination of pheophytin-corrected chlorophyll-a concentrations, because i) the methodological procedure for the photometric determination of uncorrected chlorophylla concentrations is less time-consuming, ii) the accuracy of the resulting data is better and iii) measurements obtained with different photometers are better comparable.

Key words: chlorophyll-a, pheophytin, acidfication, photometry, HPLC, method.

Introduction

Chlorophyll-a is the main photosynthetic pigment of phytoplankton species. The concentration of chlorophyll-a is used as an index for the present biomass, assuming that the chlorophyll-a concentrations are proportional to the phytoplankton biomass, which is dependent on the available nutrients (WETZEL

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