

# Annual profiles of photosynthetic lipophilic pigments in four freshwater lakes in relation to phytoplankton counts as well as to nutrient data

Peter Voitke, Toralf Schiwietz, Katrin Teubner and Johannes-Günter Kohl<sup>1</sup>

Humboldt-University of Berlin

With 6 figures and 7 tables in the text

---

**Abstract:** Phytoplankton structure and dynamics of four eutrophic lakes of Berlin were studied in 1992. The biomass change of relevant classes – Cyanophyceae, Bacillariophyceae, Cryptophyceae, and Chlorophyceae – is well represented by HPLC-analysis of photosynthetic lipophilic pigments simultaneously carried-out. Nevertheless, an estimation of algal class biovolumes or phytoplankton composition, on the basis of chromatographically recorded pigment data is restricted to a semi-quantitative consideration. Different pigment amounts in individual species of the same algal class or varying marker pigment/chlorophyll-a ratios are discussed as a reason for the misleading pigment-based quantification of phytoplankton dynamics. However, the analysis of the obtained data points to the possibility of using HPLC-aided pigment determinations in connection with microscopic cell counting for a detection of variable physiological states under field conditions; provided that mass developments of algae are dominated by a single species as common in eutrophic lakes. For time periods with dominating *Planktothrix agardhii* or *Microcystis spec.* a positive correlation was found between their content of the cyanophyte specific pigment echinenone and increasing nitrogen availability. In contrast, no relations could be detected between the changing fucoxanthin content of *Aulacoseira spec.* and any of the measured environmental parameters (nutrient concentrations or light climate).

## Introduction

Algae and photosynthetic procaryotes such as blue-green algae (cyanobacteria) contain, in contrast to higher plants, some specific lipophilic pigments

---

<sup>1</sup> **Authors' address:** Institute of Biology/Ecology, Humboldt-University of Berlin, Luisenstraße 53, D-10117 Berlin, Germany.