Biomass-size distribution of the aquatic community in limed, circumneutral and acidified reference lakes

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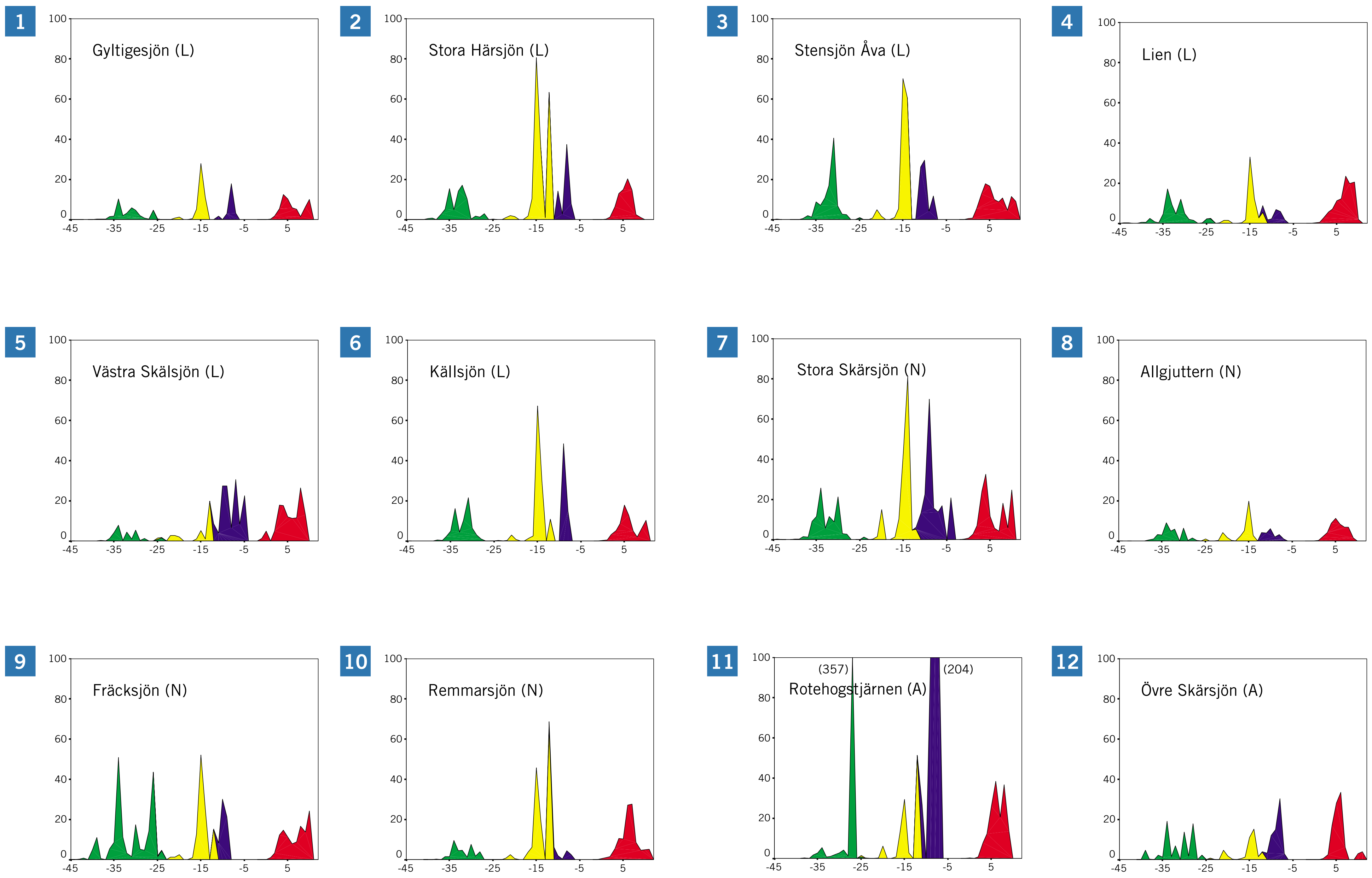

Figure 1. Relative biomass (%) in log_2-mass classes, within phytoplankton (green area), zooplankton (yellow area), benthic invertebrates (blue area), and benthic fish (red area), respectively. L = limed, N = circumneutral, or A = acidic.

❶ ***Objectives*** **• To explore national monitoring data from Swedish lakes as biomass-size distributions (BSD's), using relative biomass of phytoplankton, zooplankton, benthic invertebrates and benthic fish expressed along a joint scale of individual size. • To preliminary test if BSD's of limed lakes are not different from BSD's of non-limed circumneutral lakes.**

❷ ***Material and methods*** The study lakes were part of either the ISELAW program (six limed lakes, first liming 1977-1984) or the national program for environmental monitoring (two acidic and four circumneutral lakes). Swedish standard methods were used for sampling phytoplankton, zooplankton, benthic invertebrates and benthic fish. Semi-quantitative BSD's were compiled using data from 1997and 1998 (www.ma.slu.se, www.fiskeriverket.se)

❸ ***Results*** Semi-quantitative BSD's revealed a considerable variation between lakes (Fig. 1). Mean biomass of limed and circumneutral lakes was more similar to each other than to means of two acidic lakes, both as mean total biomass within organism groups (Fig. 2) and as mean BSD (Fig. 3), although no group of lakes was significantly different from the other (MANOVA, P >> 0.05).

❹ ***Conclusions***
The preliminary result, i.e. similarity of mean BSD's in limed and non-limed circumneutral lakes is in accordance with the liming objective. A more powerful test would, however, require a higher number of lakes in each category and/or a less heterogeneous set of lakes in terms of other confounding characteristics of the lakes, e.g. lake morphometry and productivity.

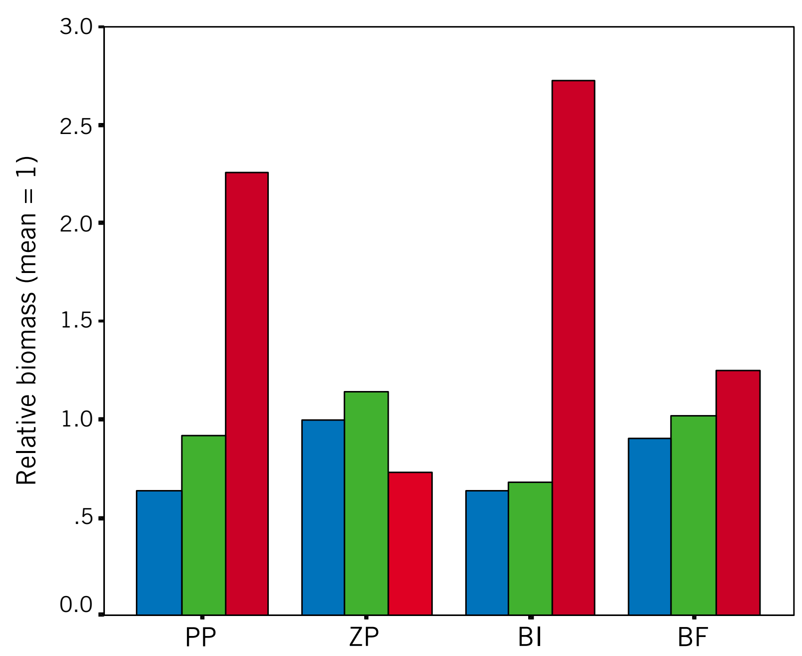

Figure 2. **Relative biomass of phytoplankton (PP), zooplankton (ZP), benthic invertebrates (BI), and benthic fish (BF) in 6 limed (blue bars), 4 circumneutral (green bars), and 2 acidic lakes (red bars). A mean of 1 is equal to 516 mm^3/m^3 (PP), 976 mm^3/m^3 (ZP), 2.65 g/m^2 (BI), and 16.7 g/m^2 gillnet area (BF).**

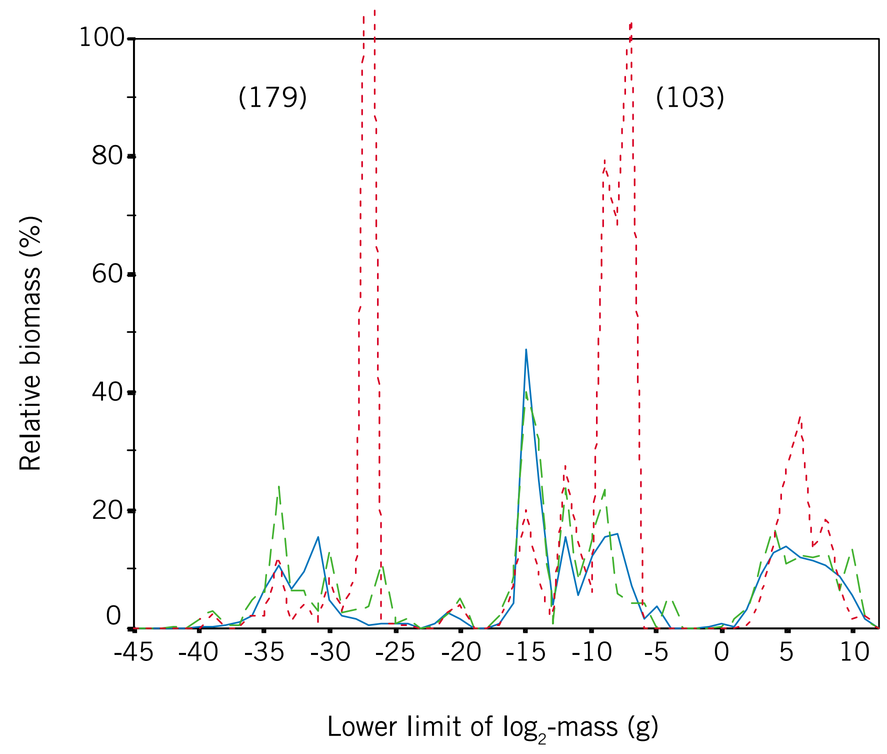

Figure 3. **Mean relative biomass distributions within 6 limed (solid line), 4 circumneutral (long dashed line), and 2 acidic lakes (short dashed line).**

Ca2+

ISELAW

Integrated Studies of the Effects of Liming Acidified Waters

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