

***Interactive comment on* “Thermocline depth and euphotic zone thickness regulate the abundance of diazotrophic cyanobacteria in Lake Tanganyika” by Benedikt Ehrenfels et al.**

Anonymous Referee #2

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This study presents a very partial view on phytoplankton of Lake Tanganyika as only large phytoplankton (>10 µm) was analyzed, while it has been demonstrated more than the half of phytoplankton biomass can not be counted correctly in an inverted microscope because of its small size.

The reader gets the impression that this study deals with the whole phytoplankton community, with statements like “filamentous genera *Dolichospermum* and *Anabaenopsis*, are key players under these conditions (up to 41.7 % of phytoplankton community)”. This is not true because picophytoplankton, which accounts for >50% (up to 80%) of phytoplankton biomass, was totally ignored in this study. For example Fig. 2 gives the

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impression that phytoplankton is dominated by chlorophytes, which is not true. This is actually reinforced in the text line 207:“The phytoplankton community in Lake Tanganyika was dominated by chlorophytes, diatoms, and cyanobacteria (Fig. 2)”. It is not true!

The authors focus their discussion on N limitation, but P is also a main limiting factor in such oligotrophic systems. Why N and not P? The literature on East African Great lakes suggests that P is actually the main limiting factor!

Another major fragility of this work is that the authors draw conclusions based only on circumstantial observations, linking nutrient concentration profiles with microscope observations of phytoplankton >10um. Their conclusions are not supported by any experiment nor statistical analysis. Taking into account that ecological processes in Lake Tanganyika are totally dominated by microbial compartments smaller than 10um, which were not took into account in this study, their conclusions probably do not stand.

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