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HIGH RESOLUTION DYNAMICS OF *PLANKTOTHRIX RUBESCENS* IN LAKE LEDRO (EASTERN ITALIAN ALPS) IN RELATION TO ENVIRONMENTAL CONDITIONS

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Among the Cyanobacteria, the phycoerythrin-rich, potentially toxic *Planktothrix rubescens* creates recurrent blooms in several oligo-mesotrophic and thermally stratified lakes. Lake Ledro (Z_{\max} : 48 m) is a subalpine hardwater lake (650 m a.s.l.) located in SW Trentino (Eastern Italian Alps). It is a modified lake exploited for hydroelectric production. After a massive *Planktothrix rubescens* surface bloom occurred in the lake during the winter 2009/2010, the Autonomous Province of Trento funded a research project aimed at studying the physical, chemical, and biological factors promoting the development of *Planktothrix* populations. The seasonal abundance, and vertical and horizontal distribution of *Planktothrix rubescens* were studied at high spatial resolution by using *in vivo* spectrofluorimetry with a BBE Fluoroprobe from June 2011 to December 2012. Environmental and meteorological variables were measured on discrete samples and *in situ* by multiparameter probes and instrumentations fixed on a platform moored to the lake bottom. The horizontal distribution of *Planktothrix* was evaluated by measurements made with the fluorometric probe along the maximum length of the lake. The high spatial frequency measurements showed a strict positioning of the cyanobacterium in 2-4 m thick water layers located just below the euphotic depth (10-18 m, in summer), with biovolumes ranging between 4 and 12 $\text{mm}^3 \text{ l}^{-1}$. High resolution horizontal fluorometric measurements highlighted the presence of a stable layer of *Planktothrix* over the lake thalweg. The thickening was characterized by differences in both abundance and depth at the extremities of the water basin. The development of *Planktothrix* was associated to the presence of microcystins in the lake, with concentrations, ranging from 0.5 to 9 $\mu\text{g l}^{-1}$. The recent *Planktothrix* outbreaks during the very last years fostered a complementary paleolimnological investigation aimed at defining the historical development of *Planktothrix* in Lake Ledro. Using cyanobacterial pigments, the analyses of the varved sediment cores, still in progress, will allow to evaluate the secular fluctuations of this species in relation to climatic variability, human impact and lake basin management.