



Tiberti Rocco, Sabino Metta, Martina Austoni, Cristiana Callieri, Giuseppe Morabito, Aldo Marchetto, Michela Rogora, Gabriele A. Tartari, Jost von Hardenberg and Antonello Provenzale. 2013. Ecological dynamics of two remote Alpine lakes during ice-free season. *Journal of Limnology*, 72: 401-416.

We studied hydrochemistry and plankton dynamics in two remote alpine lakes: lake Nivolet superiore (2530 m asl) and lake Trebecchi superiore (2729 m asl) in the Gran Paradiso National Park (Western Italian Alps) in summer 2009. The aim of this study was to enhance the understanding of natural ecological dynamics in the pelagic habitat of alpine lakes by enlarging the number of biotic and abiotic variables usually considered to this end and by increasing the frequency of samplings, generally low in remote lakes. During the eight samplings performed in 2009, chemical and physical variables were measured both in situ and in the laboratory. We also followed the dynamics of all the compartments of the naturally simplified trophic chain of the two lakes from pico-prokaryotes to phytoplankton and zooplankton. Our results confirm the oligotrophic, close-to-pristine state of lake Nivolet and lake Trebecchi as they are not affected by hydromorphological alterations, they are naturally fishless and are not sensitive to acidification risk and acidity pulses. On the other hand, the two lakes have distinct abiotic conditions due to their glacial origin and to the lithological composition of their watersheds. We found some differences in the spatial variation of pico-prokaryotes, phytoplankton and zooplankton due to the different mixing regimes and maximum depth of the two lakes. Conversely, temporal patterns were similar in both lakes, related to ecological interactions and to changes in the abiotic conditions. The rapid succession of events in extreme ecosystems, such as the alpine lakes studied here, confirm the predominant role of external environmental factors (e.g. the duration of the ice-free season) and of ecological interactions among different trophic compartments. This research underlines the importance of seasonal niche partitioning among organisms with different size.