



Tiberti R., G. A. Tartari & A. Marchetto. 2010. Geomorphology and hydrochemistry of 12 Alpine lakes in the Gran Paradiso National Park, Italy. *Journal of Limnology*, 69: 242-256.

Twelve Alpine lakes located in the Gran Paradiso National Park, in the western Italian Alps, were sampled during the ice free period in 2008 and analysed for the main morphological, chemical and physical variables in relation to the characteristics of their watershed, with the aim to create a reference database for present and future ecological studies and to support conservation politics with scientific data. The results highlighted that weathering process and direct precipitation input are the main factors determining the hydrochemistry of the studied lakes; moreover the morphological characteristics highly affects the physical properties of the lakes starting from stratification process. The acidification status, the atmospheric input of N compounds and the supply of nutrients were considered in detail. The studied lakes seem to be well preserved by acidification risk. Comparing data from Gran Paradiso National Park with data from European mountain regions ranging in N deposition rates, allows to consider long range anthropogenic impact: the detection of relative low Total Nitrogen (TN) concentration is not necessarily a synonym of a soft impact of long range pollutants, being the final nitrogen concentration dependent from retention process, closely related to catchment characteristics, besides N deposition rates; moreover the dominance of Inorganic Nitrogen (IN) on Organic Nitrogen (ON) highlights that the lakes are interested by N deposition and probably by long range transport of pollutants produced in the urbanized area surrounding the massif. However the Gran Paradiso National Park area is by far less affected by atmospheric pollutants than other Alpine regions, as the Central Alps. Total Phosphorus (TP) concentration in Gran Paradiso lakes (1-13 $\mu\text{g L}^{-1}$, mean level = 4 $\mu\text{g L}^{-1}$) is an index of oligotrophic and ultraoligotrophic conditions and according to Redfield's ratio phosphorus is mainly the phytoplankton growth limiting element, assuming a key role in biological processes and food-web dynamics; the high TN:TP ratio values detected in the studied lakes reflects the low N retention capacity of alpine sparse vegetation by comparison with prairies or forests.

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