

zooplankton are essential for understanding fluctuations in POPs (persistent organic pollutants) concentration in different compartments of the pelagic food web.

39-P Limnology at work: when scientific research leads to the successful recovery of the polluted Lake Orta. *Monica Beltrami, Pietro Volta*

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Lake Orta (18.2 km², 1.3 km³, 143 m max depth) has been severely polluted since 1926, when the lake began to receive industrial effluents containing high concentrations of copper and ammonia. Chromium-, nickel-, and zinc-rich effluents from plating factories have also contributed to pollution levels, and pH dropped below 4.0 as a result of the oxidation of ammonia to nitrates. More than 60 papers have documented the evolution of the chemical characteristics of both water and sediment, and the sudden decline of plankton, as well as benthos and fish. As a remedial action the lake was limed from May 1989 to June 1990 with 10,900 tons of CaCO₃. The treatment was immediately effective in raising the pH and decreasing the metal concentrations in the water column, and plankton and fish communities quickly rebounded, albeit as a poorly structured biological community. In the following years, the post-liming recovery of Lake Orta was tracked by monitoring its hydrochemistry and running a series of ecotoxicological studies. In 2015, a new research, based on toxicity testing of the main tributaries and the lake water column, coupled with the chemical assessment of the water quality, re-assessed the lake conditions and the real improvement of the environment.

39-P Water quality and long-term trends in the trophic conditions of the manmade Pertusillo lake (Basilicata, south of Italy): review of 50 years of monitoring activities. *Maria Francesca Scannone*¹ - *Vito Dario Colucci*²

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The aim of this study was to describe and discuss the long-term trophic conditions of the Pertusillo lake, a manmade lake completed in 1962. It is one of the strengths of Basilicata and Puglia regions water supply schemes, in fact, the water is employed into a hydroelectric power plant, for irrigation and production of drink water. The lake lies within a National Park and in the same area, are also located: the largest oil field of Continental Europe, 30.000 inhabitants, industrial, agricultural and zootechnical activities, authorized and illegal discharges of waste water. The study provides an overview of the complex dynamics of the lake Pertusillo, that is also subjected to a natural eutrophication process. The assessment of long-term ecological status was conducted through the collection and interpretation of historical dataset. The dataset was obtained from the review of 50 years of different monitoring activities (since 1963 to 2012), conducted by research centres, universities and regional environmental agency. The research has showed that the Pertusillo is a mesotrophic lake, and the water body has presented an accentuated trophic level just a few years after it was built. The lake has an extended summer stratification (thermal gradient of 12°C). The transparency, variable from 1 to 4 meters, is strongly influenced by the presence of suspended particles of silt. Oxygen concentrations vary from values of supersaturation (> 120% O₂) to anoxic values (<5% O₂). In this review, special attention is given to nutrients and phytoplankton dynamics, furthermore, a significant relationship between the level of nutrients and algal biomass has been established. The historical analysis of the algal species suggests that the present composition is not significantly different than in the past. It is therefore plausible to assume that the lake has not undergone radical environmental changes in 50 years. The seasonal increases in phytoplankton production (algal blooms) have favored anoxia condition in the hypolimnion during 1970, 1990 and 2010. Environmental data show that the lake had an experience of eutrophication in the 2010, while has recovered a mesotrophic status in 2012. Pertusillo lake has particular geomorphologic conditions which do not exclude a early silting of the lake basin and a subsequent self-cleaning capacity reduction of the lake. In conclusion, the knowledge of long-term trophic conditions can constitute a reference point for future actions to be taken to reduce the loads of nutrients incoming to the lake. Moreover, the monitoring of natural and anthropogenic pressure represents a relevant environmental challenge.