

Mechanisms underlying recovery of zooplankton in Lake Orta after liming

The goal of this study was to improve the understanding of the large-scale mechanisms underlying the recovery of the zooplankton of Lake Orta from historical contamination following the liming intervention (1989/90). The pollution has been severe and long-lasting (1929-1990). Previous analysis of subfossil Cladocera remains and rotifer resting stages in sedimentary archives, coupled with long-term monitoring data of planktonic pelagic population has indicated both the extinction of many taxa than the attempt of recolonization by rotifers.

Our results highlighted that the most number of new taxa recorded by countings belonged to Rotifers, and that, Calanoids and big Cladocera predators (*Bythotrephes* and *Leptodora*) living in the nearby Lake Maggiore, 17 years after liming, were still absent. We assessed, also, the annual persistence of Crustacea and Rotifer taxa (P) as an estimator of whether introduced propagules that survived, also thrived. We found that the rate of introduction of zooplankton colonists and their persistence in the water column of Lake Orta have changed over time (1971-2007). New rotifers taxa attempted to colonize the lake after middle '80, when the discharge of toxic substances decreased, but their persistence was low ($P < 0.5$) until the beginning of 2000s. The unexpected high values of Crustacea persistence recorded in Lake Orta in 2001 and 2007, in comparison to other environments (Sudbury lakes), could be related to the lack of zooplanktivorous fish in the pelagic waters.

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