



XXV Congresso AIOL

On-line – 30 giugno-2 luglio 2021

Contributi innovativi dell'oceanologia e della limnologia alla
conoscenza, al recupero e alla salvaguardia delle risorse
acquatiche minacciate dai cambiamenti globali

Strumenti e approcci innovativi nelle scienze acquatiche in un
mondo che cambia

Biomonitoring survey of the hydrographical network in the MAB UNESCO Alpi Ledrensi and Judicaria Biosphere Reserve (Project AcquaViva)

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Conventional taxonomic identifications based on the discrimination of diacritical morphological traits and culture based techniques have often proved inadequate in the study of microbial biodiversity (bacteria and protists) and biogeography of aquatic ecosystems. Moreover, investigations are generally focused on lakes and rivers that are also of interest for economic exploitation, therefore disregarding the small and/or ephemeral water bodies. Yet, due to their patchy and temporal habitat complexity, these neglected hydrographical elements can host a vast microbial diversity. In this work, we will report the results of a large survey of biodiversity carried out on water and sediments collected in the MAB UNESCO Alpi Ledrensi and Judicaria Biosphere Reserve (Project Acqua Viva) using high throughput sequencing (HTS) of 16S and 18S rDNA markers. The survey was carried out in 2019 in 20 sites of different sizes and characteristics. The study has allowed to disclose a high number of amplicon sequence variants (ASVs) belonging to a wide range of bacterial/cyanobacterial and protists groups. The presence of potentially toxigenic cyanobacteria was detected only in a few water bodies, including Lake Ledro, which showed the presence of *Planktothrix rubescens* and, for the first time, *Tychonema bourrellyi* in the pelagic samples.

Analysis of global satellite products for the Essential Climate Variable 'Lakes' in the LTER framework

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The ESA CCI Lakes is a multi-disciplinary project (<https://climate.esa.int/en/projects/lakes/>) to exploit satellite data to create the largest and longest possible consistent, global record of lake climate variables: lake water level, extent, temperature, surface-leaving reflectance, and ice cover. The first version of the database includes 250 globally distributed lakes with temporal coverage ranging, depending on the variable, from 1992 up to 2019. The dataset is now growing to 2000 lakes and by next November the new version of satellite products will be accessible. In this study the potential of the dataset is being explored for different case studies (i.e. Mendota, Erken, Balaton, Iseo, Garda, Trasimeno, and Peipsi) as part of the Long-Term Ecosystem Research (LTER) network. Satellite products of chlorophyll-a, turbidity and lake surface temperature from 2002 to 2019 are compared and integrated with the corresponding in situ data in the LTER dataset. Time-series of satellite data are then explored to examine trends in the context of key meteo-climatic variables.