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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

Diatoms assemblages in headwaters influenced by glaciers and permafrost under alpine deglaciation

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In the present context of climate warming, the influence of permafrost (soil remaining at ≤0°C for at least two consecutive years) to the Alpine hydrology is increasing, while glaciers and snowpack shrink. As observed in previous studies, water emerging from rock-glaciers (rocky landforms resulting from mountain permafrost) exhibit distinctive features (e.g. constantly cold and clear water, stable channels, high solute and trace elements concentrations) that determine characteristic habitat conditions and biotic communities. We investigated the physical and chemical conditions, and benthic diatoms assemblages during the vegetative period of two consecutive years in a set of kryal (glacier-fed), krenal (groundwater-fed) and rock-glacial (rockglacier-fed) headwaters of the Eastern Italian Alps. The three stream typologies showed distinct physical habitat, while differences in water chemistry were related to lithology, water origin and seasonality. The diatom abundance appeared inhibited by the glacial ablation in summer, and affected by increasing solute concentrations in autumn. We observed a general shift of the maximum annual abundance from autumn to spring/early summer. The progressive glacier retreat, and the consequent reduction of environmental harshness and habitat heterogeneity in Alpine catchments, may enhance diatoms abundance and α-diversity, and cause a decrease in β-diversity.