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DIATOM COMMUNITIES IN MOUNTAIN RIVERS HOSTING AQUACULTURE ACTIVITIES: A CASE STUDY FROM TRENTINO (NORTHERN ITALY)

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We investigated benthic diatom communities to assess alterations in water quality of streams receiving trout farm effluents. Diatom samples were collected from 22 sites upstream and downstream of 11 trout farms during summer 2024 in the Province of Trento, which, with ~60 farms, represents one of the main salmonid-producing areas in Italy. Aquaculture can alter water quality through the release of nutrients, organic matter, chemicals, and pharmaceuticals, potentially resulting in shifts in diatom community composition.

Using light microscopy, we identified preliminary 137 diatom taxa, belonging to 41 genera, with taxonomic richness ranging from 15 to 41 taxa per site. Assemblages were dominated by *Achnanthidium* (up to 86% relative abundance), followed by *Cocconeis*, which showed local dominance (up to 53%). Representative LM plates are provided for dominant or taxonomically relevant taxa, supporting the documentation of the assemblages. Furthermore, we address challenges regarding the identification of taxonomically complex taxa and their inclusion in lists used for indices calculation. These include small species within the *Achnanthidium minutissimum* complex, intermediate forms between *A. pyrenaicum* and *A. delmontii* (difficult to assign to either species), and taxa within the *Cocconeis* genus, some of which currently lack sensitivity (s) and indicator (v) values for the IPS (Specific Pollution Sensitivity Index) and TI (Trophic Index-Rott) indices. The Intercalibration Common Metric Index (ICMi), a WFD-compliant metric combining IPS and TI values, classified most stations as having at least a "Good" ecological status. Moreover, diatom guild analysis revealed a dominance of low-profile taxa, typical of low-nutrient and fast-flowing environments. Nevertheless, a longitudinal decrease in low-profile taxa was generally observed from upstream to downstream sites and a reduction in water quality was detected downstream of five trout farms.

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