

MULTIPLICITY, CHARACTERISTICS, MAIN IMPACTS, AND STEWARDSHIP OF NATURAL AND ARTIFICIAL FRESHWATER ENVIRONMENTS: THE BENTHIC DIATOM PERSPECTIVE

Marco Cantonati

MUSE—Museo delle Scienze, Limnology and Phycology Section, Corso del Lavoro e della Scienza 3, 38123 Trento, Italy; marco.cantonati@muse.it

The rationale of this talk is to briefly examine the ecological characteristics, conservation status, and main impacts suffered by the diverse types of freshwater habitats, and then illustrate these using selected benthic-diatom examples/case studies from the own research. Among the habitats that will be considered there are: springs, glacial streams, high-mountain lakes and reservoirs, mires, large lakes, lowland ditches and modified springs, saline and desert springs, tropical running waters, streams in geographic areas with Mediterranean climate. The examples/case studies will include: a diatom species indicating spring (crenal) conditions in carbonate headwaters, macroscopic growth of a hard-water diatom species in a limestone-precipitating spring (LPS), high-mountain mires as habitats exceptionally rich in diatom species included in threat categories of the Red List, the proportion of aerial diatom species as an indicator of environmental instability or of an extended land-water ecotone in springs, Swiss springs as refugia for sensitive and endangered species and the LIHRe (Least-Impaired Habitat Relicts) concept, the effects of nitrate deposition on spring diatom assemblages in different part of the Alps and in the Alps as compared to the Himalaya, diatom assemblages of springs recovering from past acidification as compared to those of extremely-low alkalinity but non-acidified springs, diatom indicators of water-level and discharge fluctuations in lakes (reservoirs) and springs, numerous putative invasive diatom species in anthropogenically modified lowland streams and springs and in fish-stocked oasis springs, salinization indicators in a shallow oasis lake, diatom species with a strict relationship to specific lithological/hydrochemical types in springs and lakes, looking for the biogeography-effect by comparing diatoms from streams with the same environmental conditions but of geographically distant areas with the same climate, species replacement due to moderate nutrient enrichment in tropical streams. A closing discussion will briefly address benthic-diatom based assessments and biodiversity-inventorying in the multiplicity of inland-water habitats, and propose reflections on the risk of separating the two. It will be underpinned that species matter, and that only accurate, updated, and high-resolution species identification allows us to fully exploit the body of knowledge built up by environmental biologists in the last decades, and to meaningfully (and correctly) address ecological problems.