

Introduction

Freshwater species live in a large variety of habitats and differ greatly in their ecological preferences. Through evolutionary processes over millions of years, aquatic organisms, in particular aquatic insects, have diversified into a highly speciose fauna, with a wide variety of ecologies. Species may prefer lentic or lotic ecosystems, different zones of a river (springs or large rivers) or varied microhabitats (e.g. stones, sand or macrophytes). Many species are specialised on food sources and have developed distinct feedings strategies, ranging from algal grazers to predators. They often favour certain temperature regimes and current velocities and exhibit different life cycles patterns. While some species tolerate a wide range of ecological conditions, others are much more specific.

Ecological preferences of freshwater organisms, often referred to as "traits", are widely used as a tool for analysing freshwater biota. Besides applications in basic ecological research (e.g. food web analysis or ecosystem delineation) they are of special importance for integrating freshwater ecology knowledge into water management practice. For more than a century the ecology of lakes and rivers has been investigated and monitored using benthic invertebrates, based on their sensitivity to environmental stresses like organic pollution, acidity and others. More recently, complex systems for analysing the ecological quality of freshwater ecosystems based on the ecological preferences of occurring organisms have been developed and implemented in many parts of the world. In Europe, in particular, the last few years have seen much development in stream assessment systems, as recent legislation demands novel integrative tools. Ecological preferences of freshwater organisms are also increasingly used for assessing and predicting the impact of climate change on benthic communities of lakes and rivers (Durance & Ormerod 2007).

Despite the multitude of applications knowledge of freshwater organisms, their distribution, habitats, life cycles and indication potential is still scattered and incomplete. Thousands of papers have been published in regional and "grey" literature, often restricted to single species and in many cases in narrative form. For applications in community ecology and ecosystem assessment, however, this information needs to be transformed into comparable data, e.g. numerical values.

In some European countries knowledge on the ecological preferences of benthic invertebrates have been summarised; the most comprehensive compilations relate to Austria (Moog 1995, 2002), Germany (Schmedtje & Colling 1996), France (Tachet et al. 2000) and Slovakia (Sporka 2003). Although they were originally restricted to individual countries, these compilations are now widely used in other parts of Europe.

The current book series aims at an even more comprehensive approach: the evaluation of all available literature references on distribution and ecological preferences of selected