

Environmental factors influencing the distribution of EPT assemblages in streams of Lake Balaton's catchment area, Hungary

ARNOLD MÓRA^{1*}, ILDIKÓ SZIVÁK², CSABA DEÁK³, RÉKA BODA², ZOLTÁN CSABAI², PÉTER SÁLY⁴, PÉTER TAKÁCS¹, TIBOR ERŐS¹ & PÉTER BÍRÓ¹

¹Hungarian Academy of Sciences, Balaton Limnological Research Institute, Klebelsberg Kuno 3., H-8237 Tihany, Hungary
E-mail: marnold@tres.blki.hu

²University of Pécs, Department of General and Applied Ecology, Ifjúság útja 6., H-7624 Pécs, Hungary

³Laboratory of Trans-Tiszaian Environmental Protection, Nature Conservation and Water Authority, Hatvan u. 16, H-4025 Debrecen

⁴Szent István University, Department of Zoology and Animal Ecology, Páter K. u. 1., H-2103 Gödöllő

(*) corresponding author

Abstract

Lake Balaton is the largest shallow lake in Central Europe. A large part of its catchment area is a reputable and popular tourism area, where the quality of surface waters is in the center of public and scientific interest. The inflows of Lake Balaton are vulnerable, due to the strong human activity upstream. Despite their significance, the aquatic macroinvertebrate communities of these inflow streams are poorly known. In the summer of 2008, we investigated the distributional pattern of EPT (Ephemeroptera, Plecoptera, Trichoptera) assemblages, and their relationships with selected physico-chemical factors and landscape characteristics at different spatial scales. Samples were taken according to the AQEM sampling protocol at 20 stream sections with different environmental conditions. Multivariate analyses were used for evaluation. Altogether 8131 specimens (6225 Ephemeroptera, 133 Plecoptera, 1773 Trichoptera) belonging to 55 species (25 Ephemeroptera, 2 Plecoptera, 28 Trichoptera) were identified. *Cloeon dipterum* (L.) and *Baetis* spp. were the most common mayfly taxa, while caddisfly communities were dominated by limnephilids [*Anabolia furcata* Brauer, *Potamophylax rotundipennis* (Brauer)] and hydropsychids [*Hydropsyche saxonica* McLachlan, *H. angustipennis* (Curtis)]. The distribution of EPT assemblages was highly affected by pH, conductivity, dissolved oxygen, temperature and total dissolved solids. At reach scale, relationships were detected between spatial patterns of EPT assemblages and structure of riparian vegetation, type of sediment, and some hydromorphological characteristics (e.g., depth and width of stream bed, cover of aquatic vegetation, etc.). At medium and large scale, the ratio of natural and human-impacted areas proved to be the most influential factor.

Key words: Trichoptera, Lake Balaton, Hungary, distribution

Introduction

Benthic macroinvertebrates have been commonly used as biological indicators of running-water-ecosystem condition for a long time (Rosenberg & Resh 1993). Among macroinvertebrates, the Ephemeroptera, Plecoptera and Trichoptera are the most commonly used taxa as water quality indicators, and their indices (ratio or total number of EPT taxa and/or individuals) are especially good for evaluation of the ecological status of streams (Bruns 2005). It is well known that the structure of macroinvertebrate communities is affected by local environmental factors, such as