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Svanhalova, Blanka ; Zahradkova, Svetlana ; Bojkova, Jindriska

Masaryk University, Department Of Botany And Zoology, Kotlarska 2, BRNO. 61137 - CZECH REPUBLIC, blanka.svanhalova@email.cz

LONG-TERM CHANGES OF MAYFLY TAXOCOENOSSES: A CASE STUDY FROM THE CZECH REPUBLIC

Long-term studies of benthic macroinvertebrate assemblage composition can serve as a basis for fluvial ecosystem impact assessment on local, regional and even a global scale. However, the appropriate data are infrequent. One of the available datasets comprises information on Ephemeroptera of the Czech Republic, collected in the 1950's, 1990's and today. The 1st period of the investigation represents the time before intensive development of industry and agriculture in the 1970's and 1980's; the 2nd period can be characterised as the beginning of the phase of some mitigation of organic pollution and acidification. Reducing of organic pollution and acidification stressed the impacts of stream morphology degradation and changed hydrology in the 2nd period, which are further intensified by climate changes today (3rd period). Thirty localities situated on stretches of different stream types (from nearly pristine to variously impacted as well as from different stream order and altitude) were evaluated from the Morava (March) River basin (the Danube tributary) and the Odra (Oder) River basin. A comparable number of species (about 45) was identified in all periods, but the average number of species per locality varied with the lowest value in the 2nd period (ca 8). The significant species exchange was stated among periods. Some sensitive potamal species disappeared (e.g. *Choroterpes picteti*) and were substituted by generalists. The species with higher resistance to drought substituted those with lower resistance (e.g. *Habrophlebia fusca* and *H. lauta*), especially at coline headwaters. The functional composition of taxocoenoses (current preferences, fixation of life cycles etc.) was changed in medium size streams, which were frequently impacted by various impoundments. The organic pollution (especially in potamal zones), changes of hydrological regime (drying-out of small streams) and stream morphology (habitat degradation and/or impoundments of middle and large streams) led to rather irreversible changes in species composition of the localities investigated.

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Svitok, Marek¹ ; Hrivnák, Richard² ; О»аheповá, Helena² ; Dúbravková, Daniela³ ; Pajove-Balang, Peter⁴ ; Slobodník, Vladimír⁵

¹Technical University In Zvolen. Masaryka 24, ZVOLEN. 96053 - SLOVAKIA, svitok@vsl.tuzvo.sk

²Institute of Botany, Slovak Academy of Sciences

³Homeland Museum in Považská Bystrica

⁴University of P. J. Šafárik

⁵State Nature Conservancy

PLANT COMMUNITIES OF CREATED WETLANDS IN CENTRAL EUROPE: DIVERSITY AND SPECIES COMPOSITION AT LOCAL AND REGIONAL LEVEL

Half the area of global wetlands has already been lost, and degradation processes continue to be uncontrolled in many parts of Europe. There is an articulated need for studies targeting wetland biodiversity at the regional scale. The purpose of this study was to assess the relative importance of regional and local processes to wetland plant diversity in created depressional wetlands in Central Europe (central Slovakia). The origin of these habitats is related to underground coal mining that resulted in changes to surface landforms and subsequent appearance of flooded terrain depressions called Koľské mokrade wetlands. Twelve wetlands were sampled for vegetation, water chemistry, morphological and hydrological data in 2008. A total of 39 plant species were found in the wetlands, dominated by *Typha latifolia* L. Wetland plant diversity was negatively related to electrical conductivity. Other local specific variables (e.g. water depth, pH, nutrients, wetland age) did not show any significant relationship with diversity measures. When analysing community composition, age, water depth and conductivity emerged as the most important factors. This supports the hypothesis that local environmental variables affect both species diversity and composition. Contrary, we did not find any significant linear relationships between plant communities and measures of connectivity among wetlands. Nevertheless, floristic data revealed a small-scale (0.8211;500 m) positive autocorrelation, indicating that wetlands in near proximity are more similar in species composition than more distant wetlands. Our results suggest rapid development of wetlands within an agricultural landscape. The importance of site-specific factors appeared to be predominant. Similar plant species composition in nearby wetlands may suggest dispersal limitation or effect of shared local factor (e.g. age). This exposes potential difficulties in successional studies that use space-for-time substitution. This study was supported by the Scientific Grant Agency of the Ministry of Education and the Slovak Academy of Sciences (VEGA 2/0013/08 and 1/0529/09).