



The benthic invertebrate community as indicator for fine sediment stress in fluvial ecosystems in intensively used areas of the pre-Alpine foothills in Austria

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According to the Water Framework Directive (WFD), the benthic community of riverine ecosystems is one of the major quality elements for evaluating the ecological status of rivers.

Based on the increasing awareness of fine sediment as one of the causes for forfeiting the good ecological status, the declared aim of the WFD, the responsible water authorities in Upper Austria have called for detailed knowledge concerning the influence of anthropogenically induced high fine sediment loads on the quality elements. Thus, a study was carried out in four sites in two neighbouring river systems. The benthic fauna was separately collected from 40 micro-habitats with a standardised method and analysed in detail. Overall, 26,500 specimens were collected and determined; 142 taxa from 52 families could be identified.

From this dataset, different standardised indices were calculated. All the data - from the species abundance up to these indices (e.g. eutrophic levels, feeding types,) - was statistically intersected with a wide range of abiotic data. This includes hydro-morphological aspects, proportions of the different uses in the catchments (e.g. arable land, settlements, streets, forests) and information on the grain size distribution.

The main outcomes of this study are: (i) 18 Taxa can be used as indicator organisms concerning fine sediment stress in the named area; 28 Taxa were determined as indicators for coarse sediment; (ii) the explanatory power of the different indices concerning fine sediment stress could be depicted; (iii) the most determining hydro-morphological factors responsible for the local impact of fine sediments on the benthic fauna were identified; this knowledge can be used for mitigation measures; (iv) the data can be used to analyse available time series of standardized benthic samplings from the last decades to show the development of the fine sediment stress within this time period.