

Epilithic diatoms as indicators of water quality and ecological status of streams of Sudety Mountains (South-Western Poland)

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With 1 plate, 2 figures and 3 tables in the text

Abstract: Epilithic diatom communities in high-altitude streams in the Polish part of Sudety Mountains were studied in the years 2004–2006 to assess water quality and ecological status. In the Polish river typology, these water bodies have been separated as the type 3: the Sudety stream characterized by a small catchment area (< 100 km²), V- or U-shaped valley, high velocity of flow, significant channel slope and a bed composed of boulders, stones and cobbles. The stream sections under study are located in Karkonosze Mountains and in Śnieżnik Massif and have been chosen following the European Union's recommendations for reference sites. The Karkonosze streams possess slightly acidic or neutral waters, with very poor electrolyte content, low total hardness and low total P content. Streams in Śnieżnik Massif have alkaline waters, with poor or medium electrolyte content, higher total hardness and higher total P content. Altogether 184 diatom taxa were determined. Species diversity ranged from poor (8–9 taxa) to moderately rich (82 taxa). The most abundant were *Diatoma mesodon*, *Eunotia exigua*, *Achnanthidium minutissimum*, *Fragilaria capucina* var. *rumpens*, *Encyonema minutum*, *Fragilariforma virescens*, *Gomphonema gracile* and *Tabellaria flocculosa*. Three diatom indices were applied in order to assess water quality: the Trophic Index (TI), the Saprobic Index (SI) and the Index of Pollution Sensibility (IPS). The TI values varied from 0.53 to 1.83 and in majority of the streams indicated ultraoligotrophic or oligotrophic waters. The SI values changed from 1.09 to 1.55 and indicated none (oligosaprobic) or slight (oligo-β-mesosaprobic) organic pollution. The IPS values were usually not lower than 17.7 and indicated waters of low trophic and unpolluted or imperceptibly polluted. Most of the streams studied may serve as reference sites for the Polish type 3 of running waters, i.e. the stream of Sudety Mts.

Introduction

Sudety Mountains are included in the Ecoregion 9: Central Highlands (Directive 2000/60/EC, Annex XI) and the Czech Massif province. The Polish part of them covers an area of ca. 4.1 thousand km². The highest summit Śnieżka reaches 1602 m a. s. l. (KONDRACKI 2001).

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0945-3784/07/0161-0287 \$ 4.75

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