ABSTRACT

The aims of the thesis were to document the history of the Cladocera (Crustacea) community structure in the Starolesnianske Lake (the High Tatra Mountains, Slovakia) with regards to environmental changes (e. g., Medieval Warm Period, Little Ice Age, anthropogenic acidification, recovery from acidification), and to analyze in detail the development of zooplankton (Cladocera, Copepoda, Rotifera) during the peaking acidification and recovery from acidification (1978 – 2015). Based on results of both the approaches, the appropriateness of using historical data on zooplankton in Tatra lakes between 1909 – 1913 (Minkiewicz, 1914) as a reference condition for the evaluating biological recovery from acidification should have been assessed. The methods used were paleolimnological analyses of lake sediment (namely subfossil Cladocera), analysis of recent zooplankton, and analyses of lake water chemistry.

It was found that in the historical record, relative abundances of Cladocera species significantly changed cca 150 years ago (at the end of the Little Ice Age and, in the main, in the period of anthropogenic acidification). The lake, though, has had a very stable species composition of Cladocera during the last cca 2,000 years, represented by four species: *Alona quadrangularis, Alonella excisa, Ceriodaphnia quadrangula*, and *Chydorus sphaericus*. During the peaking acidification, only *Chydorus sphaericus* occurred in the pelagial. With the continuing biological recovery from acidification, *Alona quadrangularis* and *Ceriodaphnia quadrangula* have reappeared. On the base of the obtained results, the Medieval Warm Period is recommended as a reference period for biological (Cladocera) recovery from acidification rather than the (so far being used) beginning of the 20th century.

Keywords: paleolimnology, Cladocera, lake sediment, the High Tatra Mountains, acidification, recovery from acidification, climatic changes