**Introduction**

Cadmium is a heavy metal that is a significant pollutant of aquatic ecosystems. Sources of cadmium are either natural (erosion processes) or anthropogenic (waste from cement manufacture and metallurgical works, municipal refuse and sewage sludge, and atmospheric deposition)(citace). In view of global warming, it is still not clear how the two factors of increased temperature and cadmium pollution will interact together.

Water quality programs based on biotic indicators are being implemented worldwide to monitor aquatic ecosystems with the aim of improving their management and ultimately, achieving better ecological status(citace).

Periphytons are among the primary accumulators of metals in natural rivers because of their fast reproduction and comparatively high biomass. Diatoms are key components of periphyton and have long been used as biological indicators of hydrosystem disturbance(citace).Their most important phenotypic synapomorphy is the rigid silica cell wall (frustule), which is composed of two complementary parts (thecae). The upper part of frustules, called the valve, is characterized by various types of symmetric patterns(citace).

The test organism used in this work is Eunotia bilunaris, a diatom species complex occurring mostly in oligotrophic waters with a low pH, peatland aquatic habitats in boreal ecosystems. The valves of E. bilunaris are typical for arcuate isopolar outlines with rounded polar ends that are slightly tapered(citace).

Diatoms are generally sensitive to the environmental conditions of their habitats, which is reflected in the changes of their species composition in natural communities and in the patterns of morphological variation of frustules. Geometric morphometry provides the ability to automatically induce teratological changes in cells, thus allowing for use in the bioindication of heavy metals in water(citace).

Cadmium led to the development of abnormal valve outlines in many species of Diatoma such as interruption of the raphe, abnormal pore shape and pattern, also caused unusual colony formation(citace).

Based on the current literature, the presence of deformities in contaminated environments is considered an indication of stress. However, the percentage of deformities alone often fails at highlighting the magnitude of toxic exposure. In other words, not all studies have succeeded in showing a relationship between the proportion of abnormal valves and contamination level along a gradient of exposure(citace)(citace)(citace).

This thesis is focused on the applicability of selected diatom species as an indicator of heavy metal contamination. The focus is on the magnitude of teratological changes that occur under conditions of temperature gradient and an attempt to create a scale, to help in the practical evaluation. For this purpose, cells of Eunotia bilunaris were collected from peatlands, and were grown in a cross gradient of cadmium contamination and temperatures. Cell teratology was assessed using morphometrics. The results should demonstrate how global warming can exacerbate water pollution, and help develop a transparent scaling of these changes.