

Calcareous spring-fed fens as powerful palaeoclimatic and palaeobiological archive and unique ecosystem and refuge, hosting rare and endangered species of plants and animals

The ongoing climate changes and their unknown consequences led scientists to look for the way to predict what may happen in the near and more distant future. It was early realized that natural archives may help to understand the ongoing changes and to foresee how the global environment may react. One of the most important and reliable archive on land are deposits formed in wetlands. In the proposed project we concentrate on the specific type of wetland, calcareous spring-fed fens, persistence of which depends on the active supply with waters rich in carbonate ions and therefore depends on the climate humidity. Combination of peculiar ecological conditions at the spring-fed fens was found suitable by a number of plants and animals adapted to mineral rich substrates, including endangered species present on the 'Red List'. Sites selected for the present project are located in the young glacial area of the eastern Baltic region. Postglacial sediment records of the spring-fed fens in this area, so far have received very limited attention by palaeoecologists and palaeoclimatologists.

The major objectives of the proposed project include determination the spring-fed fen sensitivity as a palaeohydrological archive, and recognition of plant and mollusc history at the sites studied with special attention paid to reaction of taxa specific to spring-fed fens, including endangered and protected species, to environmental changes.

Since the calcareous spring-fed fens are widespread across the globe occurring on different continents, wherever the carbonate rocks occur, they are potential powerful palaeoclimatic and palaeobiological archive. Therefore, verification of the application of the spring-fed fens deposits in detailed palaeohydrological studies may be of broad interest among quaternary palaeoclimatologists.

Study of population dynamics and continuity of occurrence in the sediments may help to assess vulnerability of the sites studied to future climatic changes. It is very important for the conservation strategy of the rare spring-fed fen ecosystems. In order to properly manage the protection and restoration of the spring-fed fens it is essential to know the history of the fen development, reaction of the ecosystem to environmental changes, history of population dynamics and continuity of occurrence.