

In the sediments of landslide fens (formed in depressions occurring within landslides), changes of the climate and the natural environment of the Carpathians have been recorded since the Late Glacial (last 14-15 thousands years). These sediments reflect variations in vegetation (recorded as pollen and plant macrofossils changes), as well as a periodic increase in climate humidity, during which mineral sediment was supplied to peat bogs and the horizons of silt and clay were formed in the peats. Comprehensive studies of the sediments of landslide fens allow for a fairly detailed reconstruction of palaeoenvironmental (and palaeoclimate) changes, which may also be important for understanding the climate change taking place today. So far, on the basis of that type of analyses, the alterations in the natural environment of the Carpathians during the Holocene epoch (the last 11.7 thousands years) have been well recognized. However, knowledge about changes in the natural environment occurring earlier, during the so-called Late Glacial (the end of the last glacial period, covering about 15-11.7 thousands years), is still insufficient for the Western Carpathians. Although in the Southern Carpathians several profiles of peatlands with a very long sequence of the Late Glacial sediments have been elaborated so far (Feuerdan et al., 2007), very few similar sites exist in the Western Carpathians. This small number makes it difficult to reconstruct the palaeoenvironmental changes in this part of the Carpathians for the Late Glacial, although some recent studies indicate that the climate change in the subarctic conditions prevailing here at that time was abrupt and frequent. Such research is possible to conduct for the sediments of the Kotoń (731 m. asl) and Klaklowo (472 m. asl) landslide fens in the Beskid Makowski Mts. (N part of the Polish Western Carpathians). The beginning of accumulation of organic and mineral sediments in these peatlands took place about 15-13.5 thousands years ago. During the grant implementation, the sediment profiles of both fens, which contain long sequences of the Late Glacial deposits, will be analyzed: the Kotoń - 3m (total sediment thickness is 4.5m), and the Klaklowo - 2.7m (3.7m of sediment thickness). Based on the analysis of plant macrofossils (seeds, leaves, needles, wood) occurring in sediments and lithological study of these sediments (loss on ignition, grain size analysis) conducted by a PhD student for two profiles in each fen, and with the support of numerous absolute dates derived from radiocarbon method (^{14}C), changes in palaeoenvironment in the vicinity of landslide fens will be reconstructed for the Late Glacial period (local record). More specifically, the changes taking place within the two distinct locations: top part of the mountain (Kotoń) and the valley zone (Klaklowo), will be compared. Analysis of the pollen grains in deposits (palynological analysis) performed by specialized laboratories will allow to determine how local changes in the natural environment reflect climatic (and environmental) changes regional or common in character. Comparison of changes in plant macrofossils composition among two profiles taken from different parts of the same fen, will allow to determine to what extent the macrofossil analysis of just one profile is representative for a given fen, especially during the Late Glacial when plant species were characterized by low biodiversity. The studies will also allow for a more detailed reconstruction of the plant cover history in the vicinity of fens during the short-term (190 yrs) cooling of the climate in the so-called Older Dryas Stadial (13540-13350 calendar years). In such a short period of time in both bogs a horizon of sediment with a thickness of 0.5 m was formed. Moreover, based on the analysis of plant macrofossils, the hypothesis concerning the presence of refugium of thermophilous plants (linden, oak, hazel) during the Late Glacial on the Kotoń landslide, as indicated by the analysis of pollen in the sediments performed so far, will be verified. The considerable thickness of the Late Glacial sediments makes it also possible to search for volcanic ash levels (the so-called tephra) associated with numerous volcanic eruptions which occurred during the Late Glacial and form important stratigraphic horizons. These are eruptions from: the region of the Campi Flegrei in southern Italy, Laacher See in the Eifel Mts. in Germany, or the Sfanta Ana in the Romanian Carpathians.