

MOBILITY OF CHROMIUM AND LEAD ORIGINATING FROM WEAVING  
INDUSTRY: IMPLICATIONS FOR RELATIVE DATING OF LOWLAND RIVER  
FLOODPLAIN DEPOSITS (THE OBRA RIVER, POLAND)

MARCIN SŁOWIK, ZYGMUNT MŁYNARCZYK, TADEUSZ SOBCZYŃSKI

**Abstract:** Laboratory and field experiments have been conducted to study mobility of chromium and lead in floodplain sediments. The main goal of the research was to verify a hypothesis whether changes of chromium and lead concentration could be used to estimate the relative age of floodplain deposits. The basis for undertaking such research was the presence of weaving industry centers in the Obra River valley between the 16<sup>th</sup> and the 19<sup>th</sup> century and using Cr and Pb compounds in paint recipes. The Cr and Pb contents were also analyzed in three vertical profiles unaffected by the field experiments. The age of organic sediments in each of the profiles was determined using the radiocarbon analysis. The results of the laboratory experiments have shown that the highest contents of the elements were noted in the surface layer of the sediments placed in the column. However, the contents decreased during the last phase of the experiments and both vertical and horizontal migration of both elements was observed. A more intensive mobility was observed in the field test. Its cause could be the changes of the groundwater level, floodplain inundation and pH conditions in alluvial deposits. Such processes may have influenced migration of the compounds originating from the weaving industry production; Cr and Pb contents detected in the profiles unaffected by the field experiment were too small to be used for relative dating of alluvial deposits. Moreover, the alluvial deposits with increased contents of the studied elements may be older than the period of the weaving industry development. Cr and Pb mobility was especially intensive in the profiles situated within the near bed zone of the floodplain due to regular inundation, and the activity of erosion and accumulation processes entraining the studied elements back to transport in the river bed.