



Geochronology of Danube Delta sediments The PN-II-RU-TE-2012-3-0351 project

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The sedimentation processes and the associated morphological changes within the Danube Delta and along the deltaic coast are complex and less understood. One of the main objectives of the project is the determination of sedimentation rates in several lacustrine units from the Danube Delta area, lakes in which the sedimentation rate clearly reflects the variation of the rivers solid discharge. Several undisturbed bottom lake sediments from the Danube Delta were extruded and the analysis of the vertical variation of the sedimentary facies, combined with ^{210}Pb and ^{137}Cs radiometric methods is undertaken in order to get a high resolution data of the sedimentation rates during the last one century. Additionally, sedimentation pattern in the proximity of the fluvial levees will be investigated for the first time at several locations in order to get insight into the lateral and temporal variations in sediment accumulation rates.

Another objective is the assessment of the sedimentation rates on the Danubian continental shelf. This investigation will identify the tendency of the sediment deposition rates offshore of the closure depths during the last century and, more importantly, the main actual depocenters repartition and the associated sedimentation rates will be identified. The sedimentation rates data will contribute to the analysis of the sedimentary linkage between the river discharge, the longshore currents and the shoreline dynamics in order to isolate and quantify the role of the river solid discharge contribution to the long shore transport and to the shoreline dynamics and river distributaries mouth changes.

The third objective is the geochronological investigation of the youngest deltaic lobes (Sfântu Gheorghe, Sfântu Gheorghe secondary delta, Chilia secondary delta) by means of luminescence dating in order to obtain a high accuracy of their evolution in time (e.g. last 3000 years).

This study represents the first investigation of sedimentation rates and fluxes within the Danube Delta and over the associated Danubian continental shelf, using the radiometric method of ^{210}Pb (^{210}Po) and ^{137}Cs . The detailed stratigraphical survey of the deltaic sediments will provide an accurate view of the sedimentation characteristics in the last ~ 100 years, including the impact of the hydrotechnical works built within the Danube basin on the sedimentation rates and on the deltaic continental shelf evolution. Another important aspect of the present project is featured by the combined application of three complex radiometric and nuclear tools: alpha spectrometry (^{210}Po), gamma-spectrometry (^{210}Pb , ^{137}Cs , and ^{226}Ra) and luminescence absolute method.

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