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Radioactivity and heavy metal concentrations and assessment of hazard indices in sediments from Zhushan bay at Taihu Lake, China

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Surface sediment cores from the Zhushan bay of Taihu lake in China were collected. In this study, the concentration of eleven heavy metals (Al, Co, Cr, Cu, Mn, Ni, Ti, V, Zn, Pb, Cs) and the radioactivity of two radionuclides (^{210}Pb and ^{137}Cs) were investigated. The mean concentration of Cr, Cu, Ti, Pb indicated is slightly higher than the background values, and the rest doesn't exceed the background value. Compared with the levels in the Environment Quality Standard for soils of China (EQSS), the mean values of main heavy metals, such as Pb, Zn and Cr, is located level 1 of soil quality, which showed the concentration of these elements is ordinary in the sediment. while the concentration for Cu is located level 2 which indicated there is minor enrichment for Cu. The situation was confirmed by the enrichment factor (EF) of heavy metals showing the similar result. In terms of radioactivity concentration for ^{210}Pb and ^{137}Cs , the mean 139.9 Bq/kg for ^{210}Pb and 21.3 Bq/kg for ^{137}Cs were more lower than the limited value 260 Bq/kg and 120 Bq/kg according to the Standard soil of quality assessment for Exhibition site (SSQAE) of China. The study result implied that the lacustrine sediment can be retired to the farmland or used to be construction materials in the ecological engineering of dredging process.

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