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Natural Radionuclides in Rice Soils in the Mekong Delta Region, Vietnam: Health Risk, Transfer to Rice, and Long-Term Accumulation in Topsoil

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In the world, many studies have focused on the natural radioactivity in agricultural soils and food crops and the transfers of radionuclides between two components. However, the influence of longterm agricultural practices on the activity concentrations of radionuclides in the soils remains unclear. On the other hand, the soil-to-plant transfer factors of radionuclides for a specific plant type are different between the regions of the world. In this study, activity concentrations of natural radionuclides in 16 rice and corresponding soil samples in the Mekong Delta region of Vietnam were measured by a gamma spectrometer with a high purity germanium detector. The accumulation rates of radionuclides were predicted by using a model based on the balance between input and output rates of radionuclides in the topsoil. From the results of this study, it is evident that irrigation system is the main factor that caused accumulations of radionuclides in the soil. Water leaching and rice uptake were two processes that were responsible for the rejection of radionuclides from the soil. The accumulation rates of radionuclides are therefore controlled by changing the cultivation conditions.

Summary

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