

Transportation mechanism of arsenic (As), cesium (Cs) with iron (Fe) from river to paddy rice through irrigation in river water system

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Some toxic trace elements are often transported to paddy field through irrigation from river water. The transportation mechanism of toxic trace elements in a local river water system is important for sustainable, environmental conservation and for risk reduction. In order to clarify the transportation process on As and Cs in the grain of paddy rice, we analyzed the concentrations of trace and major elements in three river waters, paddy field waters, and paddy rice, root, shoot, leaf, and grain, and paddy soil, separately, in three areas. From the complex relationships between As and Fe, and Cs and Fe in various situations, it is inferred that Fe works as an attracter to As and Cs within paddy rice, though these elements are often transported in river water, separately. The As and Fe in rice grain correlates with Fe in paddy water, while they are not correlates with Fe in paddy soil, suggests the As in rice grain comes from river water through irrigation. The Cs in rice grain correlates with Cs in paddy water, indicates Cs comes from river water through irrigation.

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