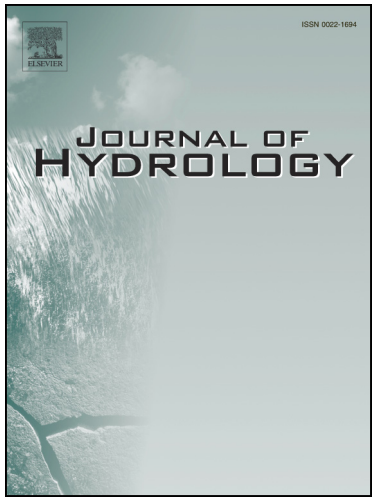

Research papers

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PII: S0022-1694(18)30271-3
DOI: https://doi.org/10.1016/j.jhydrol.2018.04.018
Reference: HYDROL 22721

To appear in: *Journal of Hydrology*

Received Date: 30 June 2017
Revised Date: 3 March 2018
Accepted Date: 5 April 2018

Please cite this article as: Nakaya, S., Chi, H., Muroda, K., Masuda, H., Forms of trace arsenic, cesium, cadmium, and lead transported into river water for the irrigation of Japanese paddy rice fields, *Journal of Hydrology* (2018), doi: https://doi.org/10.1016/j.jhydrol.2018.04.018

Forms of trace arsenic, cesium, cadmium, and lead transported into river water for the irrigation of Japanese paddy rice fields

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Abstract

In this study, we focus on the behavior of geogenic, toxic trace elements, particularly As, Cs, Cd, and Pb, during their transportation in two rivers for irrigation commonly used in monsoon Asia; one river originates from an active volcano, Mt. Asama, and the other originates from a currently inactive volcano, Yatsugatake Mountains in Nagano, Japan. These rivers were investigated to understand the role of river water as a pollutant of rice and other aquatic plants (via irrigation) and aquatic animals. The results indicated that the behavior of toxic trace elements in river water are likely controlled by their interactions with particulate Fe, Al, and Ti compounds. The majority of Pb and Cd is transported as particulate matter with Fe, Al, and Ti, while the majority of As is transported in the dissolved form, predominantly as arsenate, with low abundance of particulate matter. Cs is transported either as the dissolved form or as particulate matter in both rivers. The investigated elements are transported in the