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Dissolved Organic Matter-Complexed Iron in Two Rivers with Different Types of Soils in Watershed Area

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ABSTRACT

Concentrations of dissolved organic matter (DOM), dissolved humic substances (DHS), and DOM-complexed Fe (DOM-Fe) in Yamakuni and Oita Rivers, Japan, of which headstream is near in location, flow pass length is similar, but watershed soil type differs, were investigated. Soil organic matter level was higher in black Andosols distributing 67% of the watershed area of the Oita River than in Cambisols covering 90% of the watershed area of Yamakuni River. However, the DOM concentration in the Yamakuni River (0.44 - 1.62 mg $\cdot C \cdot L^{-1}$) tended to be higher than that in the Oita River (0.13 - 1.37 mg $\cdot C \cdot L^{-1}$). DHS accounted for 49% - 80% of DOM in both rivers. Fe and DOM-Fe concentrations showed a trend to increase toward downstream but decrease at the estuary in both rivers. DOM-Fe accounted for 26% - 90% and 55% - 93% of dissolved Fe in the Yamakuni and Oita Rivers, respectively. Correlation analysis suggested that the DOM-Fe concentration in the river water was controlled by the capacity for supplying Fe ions rather than that for supplying DOM. Although the ability to form a complex with Fe was suggested to be greater in the DOM in the Oita River than that in the Yamakuni River, the DOM-Fe concentration at the estuary was similar in the two rivers. Thus, the effect of soil organic matter level in the watershed area on the supply of Fe or DOM-Fe to the estuarine ecosystem was not significant.

KEYWORDS

Dissolved Organic Matter (DOM); Dissolved Humic Substances (DHS); DOM-Complexed Fe (DOM-Fe); Watershed Area

Cite this paper

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