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THE ENVIRONMENTAL GEOCHEMISTRY OF RECENT SEDIMENT IN SMALL LAKES IN THE SOUTHWEST OF KARELIA, RUSSIA

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Abstract

In this article, issues of environmental pollution due to long-range atmospheric transport of heavy metals are considered. Researches of recent sediment cores of Lakes Liunkunlampi and Raivattalanlampi from the Republic of Karelia were carried out. The purpose of the study was to give a detailed environmental and geochemical assessment of the recent sediment in these small lakes located in the southwestern part of Karelia. The scope of the study covers the area of the southwest of Karelia (Russia) and touches the environmental problems of northern Europe. The maximum of heavy metal accumulation appears in the upper sediment layers from 0 to approximately 15 cm. The main pollutants of the lakes are Pb, Cd, Zn, Cu, Sb, Sn, Bi, and Tl, which are geochemistry agents of long-range pollutant transport from anthropogenic sources of Russia, Finland and other countries of Northern and Eastern Europe. It was revealed that the type of bottom sediments significantly influences the activity of heavy metal accumulation by these deposits. Bottom sediments of Lake Liunkunlampi contain more heavy metal concentrations than sediments of Lake Raivattalanlampi, because Liunkunlampi deposits consist of about 80% organic matter, whereas Raivattalanlampi sediments are made up of 26% organic matter. Analysis of fractions of heavy metals illustrated that pollutants basically are bound with mineral and organic phases of lake sediments in south-west Karelia. The high bioavailable of some metals (Cd, Pb, Zn) are noted.

Keywords: bottom sediments, fractions of pollutants, heavy metals, Republic of Karelia, sapropel, small lakes

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