



## **Distribution of total mercury in peat soils profiles in Western Siberia**

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The behavior of mercury in the environment depends on mercury physical-chemical properties and a wide variety of chemical compounds which can be formed in natural condition. M. Meili (1991) suggested a “Mercury/Biomass” conception which supposes existence of connection between contents of the mercury and contents of biogenic elements. According to this model different natural object has different biogenic elements, with which Hg forms stable compounds. Carbon is typical for soil, surface water and sediment, Nitrogen - for biota. At transition from one natural object to another the basic element changes, changes the form of mercury bounds and occurs fractionating. Indicator of bound change is the ratio Hg to B, where B is one of biogenic elements. The purpose of the work was to analyze the mercury distribution in peat soils at oligotrophic bogs of Western Siberia with the use of “Mercury/Biomass” model.

The distribution of total Hg contents in peat soils were studied in three typical for oligotrophic bogs ecosystems presenting united the landscape section of small river catchments. The depth of peat deposit changes from 0.9 m at the bog periphery to 3 m in the central part of the bog. Determination of Hg contents in peat samples was conducted with the use of mercury gas analyzer RGA-11 (Developed in Institute of monitoring of climatic and ecological systems, Russia).

Depth distributions of mercury in different peatlands are similar. Maximal amount of mercury observes in the upper layers of peat deposit. Deeper layers contain less mercury. High mercury concentration in top layers is caused by the presence of geochem-

ical barrier in peat deposit, where many chemical elements are accumulates, including mercury.

The character of mercury distribution in soils is associated with processes of decomposition, fermentation and humification of plant remains. Hence, mercury transformations in soils must be connected with transformations of the main biogenic elements (carbon and nitrogen). Model based on the Mercury/Biomass conception was developed for describing the behavior and distribution of the total mercury in the different horizons of the peat soil. It was shown that the most probable mercury-linking centers in peat deposit are N-containing centers in the whole profile of the peat soil, except the upper aerobic horizon, where C-containing centers of humic acids also can be mercury-linking centers. The general dependencies for total mercury contents ( $Hg_{total}$ , mkg/kg) from C/N ratio were derived for studied peat soils in form:

$$Hg_{total} = N_{total}(a-bC/N);$$

$$Hg_{total}=HA(c-dC/N),$$

where  $N_{total}$  and HA are total contents of nitrogen and humic acids in g/kg, a, b, c, and d are coefficients of regressions.

Suggested model of Hg compounds transformation in a profile of peat soils based on the conception of "Hg/B" ratio allows calculating the total Hg contents in horizons of peat soils using data on contents of main biogenic elements (C and N). Good agreement exists between calculated and experimental data on Hg contents in peat soils.