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Microelements in Lowland Peat of the Northeastern Part of the Altai Mountains

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The greatest areas of bogs are concentrated in the northeastern part of Altai Republic. This place due to a great amount of precipitation and a powerful accumulation of snow with a little drain in comparison with other areas has plenty of bogs. A quarter of all bogs of the Altai Mountains is concentrated here. The bogs develop mainly in the valleys of the rivers. The bogs have a modern origin and the process of bog formation goes at the present time by overgrowing of oxbow and valley lakes, and also by bogging of dry lands - woods and meadows. The area of bogs in relation to the general territory of highlands makes up 1%. Nevertheless, these territories are regarded as complex ecosystems which have economic and scientific value.

Let's consider the content of heavy metals in different horizons of the peat under study. The samples of peat of the deposit being examined are characterized by a low total content of zinc: 6,21-44,12 mg/kg. The average amount of zinc in the soils of the Altai Mountains is much larger and makes up 70,3 mg/kg.

Quite a significant amount of copper is washed away from peat thickness, its total amount is at the level of 1,58-10,73 mg/kg. The reason for it, probably, lies in the fact that there is a significant amount of fulvic acids in the composition of humic acids which enable the migration of copper beyond the limits of the peat ground in the conditions of the sour environment.

A completely different situation is observed in the soils of the Altai mountain area. The biogeochemistry of copper in the soils of the Altai Mountains is thoroughly investigated by M.A.Malgin, A.V.Puzanov, O.A.Yelchininova. Its average amount in the soils of the Altai Mountains makes up 40,6 mg/kg which is twice as much as the abundance ratio in comparison with the world soils. The authors explain this fact as follows: copper is an inactive element in the soils since its ions are easily precipitated by sulfide-, carbonate-, and hydroxide ions, and also are taken up by humic acids of soils. Therefore, notwithstanding the washing type of a water mode, the leaching of copper from the soils of the Altai Mountains is not observed.

The amount of cadmium in the investigated lowland peat makes up from 0,12 up to 0,57 mg/kg which is almost two times less than the roughly allowable concentration. Also the monotonous increase of the concentration factor of cadmium upwards on the structure is observed. The peat of the surveyed deposit as far as the amount of cadmium is concerned is actually at the level of the background soils of the Altai mountain area.

The amount of lead in the peat under study is not subject to significant fluctuation - from 1,34 up to 10,0 mg/kg which is lower than the average amount characteristic of the soils of the Altai Mountains. The roughly allowable concentration of lead for sour soils makes up 65 mg/kg, therefore the peat under study is non-polluting or lead-free. There is an even distribution of lead in the structure of the axial section.

In the distribution of zinc, copper, cadmium, lead in peat thickness there is a contrast between the top layers and the bottom ones. The top layers are characterized by higher concentration of elements.

The lowland peat of the northeastern part of Altai Republic in comparison with the West-Siberian peat is characterized by the increased values of zinc and has the same amount of copper and lead.