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A Few Issues on the Peat Research in the Altai Mountains

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At the present time we carry out complex research of marsh ecosystems in various areas of Gorny Altai to reveal the perspective deposits of peat in the Altai Mountains with the purpose of its use in the medical and recreational spheres. The peat deposits of the Northeastern Altai, Central Altai, and Southeastern Altai are surveyed; the selective chemical analysis of peat and marsh waters is carried out.

The group structure of organic substance of various samples of peat is investigated by the method of Institutes of Peat. The toxic metals of Cd, Pb, Hg, Cu, Zn, and As were defined by the method of stripping voltammetry.

The region of the Altai Mountains is characterized by the contrastive distribution of some heavy metals and arsenic in a soil cover. This is caused by a variety of petrography and granulometry of soil forming material, and also by a landscape and geochemical situation in the system of vertical zoning. The sources of natural accumulation of heavy metals in the ground might be the deposits of polymetals. In this connection the content of the specified toxic elements in the peat under research has been identified.

The peat of the Turochak deposit is characterized by a significant ash content - up to 41,9%; the increased ash content is typical of the Kutyush deposit: from 6,1% up to 19, %. The peat of the Northeastern Altai is referred to non-bitumunous: the content of bitumen makes up less than 5%. In comparison with the European peat the peat under study of the transitive and lowland type is characterized by the significant content of easy hydrolysable substances in the amount of 24,8-41,1%.

The amount of the non-hydrolysable rest makes up around 4,3 - 7,4 %. The total content of fulvic acids is less than the content of humic acids by 2,9 - 5,8 times. The high content of humic acids which can reach up to 58 % is characteristic of certain deposits.

Humic acids extracted from the peat are characterized, as a rule, by similar IR-spectra. The distinctions are shown in an unequal intensity of characteristic absorption bands, in their spreading and some shifts. It is revealed that humic acids of peat with the increase in a degree of decomposition are exposed to transformation; therefore the increase in their structure of functional groups is observed.

As a result of the research which was carried out the following elements among heavy metals in the lowland peat of the Altai Mountains are revealed:

Cd (2,7 - 30)> Hg (0,67)> Zn (0,22) ∼Pb (0,21)> Cu (0,13)> As (0,03).

The degree of mobility of chemical elements in the peat varies within the limits of 1,3 - 36%. According to the degree of their mobility these elements form the following line:

Zn (36 %)> Pb (18,1 %)> Cd (9,6 %)> Cu (1,3 %).

The content and the character of distribution of the heavy metals under study and arsenic in the peat of the Altai Mountains have their unique features in comparison with the same valley analogues. The mountain peat of the Central Altai contains much less Hg than the West Siberian one: 0,078 mg/g and 0,69 mg/g accordingly. Cd represents itself as the concentrator in the lowland peat of the Northeastern and Central Altai, its content is actually the same and makes up approximately 0,3 mg/kg. The lowland Altai and West Siberian peat has the same amount of Pb: 4-5 mg/kg; they have smaller amounts of Zn and Cu in comparison with the European and West Siberian peat. The revealed features of distribution of some toxic metals are the display of specificity of peat genesis in the

conditions of a mountain relief.

The complex of the data received by us allows to consider the peat of the Altai Mountains as a non-polluting raw source concerning the amount of some natural toxic substances. The possible perspective directions of practical application of the mountain peat can be medicine, veterinary science, and agriculture.