



Ecological risk assessment: influence of texture on background concentration of microelements in soils of Russia.

Olga Beketskaya

Faculty of Soil Science, Moscow State University, Moscow, Russia (bekeckaya@list.ru)

In Russia quality standards of contaminated substances values in environment consist of ecological and sanitary rate-setting. The sanitary risk assessment base on potential risk that contaminants pose to protect human beings. The main purpose of the ecological risk assessment is to protect ecosystem.

To determine negative influence on living organisms in the sanitary risk assessment in Russia we use MPC. This value of contaminants show how substances affected on different part of environment, biological activity and soil processes. The ecological risk assessment based on comparison compounds concentration with background concentration for definite territories.

Taking into account high interval of microelements value in soils, we suggest using statistic method for determination of concentration levels of chemical elements concentration in soils of Russia. This method is based on determination middle levels of elements content in natural condition. The top limit of middle chemical elements concentration in soils is value, which exceed middle regional background level in three times standard deviation. The top limit of natural concentration excess we can explain as anthropogenic impact.

At first we study changing in the middle content value of microelements in soils of geographic regions in European part of Russia on the basis of cartographical analysis. Cartographical analysis showed that the soil of mountainous and mountain surrounding regions is enriched with microelements. On the plain territory of European part of Russia for most of microelements was noticed general direction of increasing their concentration in soils from north to south, also in the same direction soil clay content rise for majority of soils. For all other territories a clear connection has been noticed between the distribution of sand sediment.

By our own investigation and data from scientific literature data base was created. This data base consist of following soil properties: texture, organic matter content, concentration of microelements and pH value. On the basis of this data base massive of data for Forest-steppe and Steppe regions was create, which was divided by texture.

For all data statistics method was done and was calculated maximum level natural microelements content for soils with different texture ($\mu+3\delta$). As a result of our statistic calculation we got middle and the top limit of background concentration of microelements in sandy and clay soils (conditional border – sandy loam) of two regions.

We showed, that for all territory of European part of Russia and for Forest-steppe and Steppe regions separately middle content and maximum level natural microelements concentrations ($\mu+3\sigma$) are higher in clay soils, rather than in sandy soils. Data characterizing soils, in different regions, of similar texture differs less than the data collected for sandy and clay soils of the same region.

After all this calculation we can notice, that data of middle and top limit of background microelements concentration in soils, based on statistic method, can be used in the aim of ecological risk assessment.

Using offered method allow to calculate top limit of background concentration for sandy and clay soils for large-scale geographic regions, exceeding which will be evidence of anthropogenic contamination of soil.