

# **GEOLOGICAL CHALLENGES FOR GEOPATHOGENIC TERRITORIES WITH DEFICIENCY AND EXCESS OF CHEMICAL ELEMENTS**

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Chemical composition of plants and correspondingly chemical composition and crops of agricultural plants are closely connected with geology of concrete territories. This is true when nutrition horizon of plants is situated in lower parts of the rootinhabited zones at a depth from 1-5 to 10-70 m (lithobiogeochemical model); in top parts of the upper water horizon or its cappillary edging at a depth from 3-30 to 100-1000 m (hydrobiogeochemical model); at a depth of tens, hundreds and even thousands meters for gaseous chemical elements or their gaseous forms (gasbiogeochemical model, mercury, for example). Geology is the main controlling factor of geopathogenic biogeochemical provinces with deficiency of physiologically necessary chemical elements or excess of toxic elements. It has been established that natural deficient biogeochemical provinces may be spread for large territories including whole countries. The examples are biogeochemical provinces with deficiency of I, Se, F, Zn, Fe. Biogeochemical provinces, lineaments sites and localities with excess of many toxic chemical elements usually cover smaller areas. The most significant are Se-excessive provinces in the Western states of the USA and in the Southern states of Canada. Another new example is As-excessive biogeochemical provinces in Bangladesh and West Bengal-India. Similar As provinces are situated in the Western Yakutiya and in the northern part of the Krasnoyarsk region in Russia. Excessive biogeochemical localities and lineaments may be of natural – geologic or anthropogenic origin. They are known for many chemical elements: Li, Na, Cu, Be, Ca, Sr, Ba, Zn, Cd, Hg, U, B, Al, Tl, Pb, As, Sb, Bi, Cr, Mo, S, Se, Mn, F, Cl, Br, I, Rn, Ni.