

Toxicity as an eco-geochemical problem

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Nowadays hundred million people are subjected more or less to some toxicity, and this situation needs immediate and cardinal solution. Performed studies show that there is no fundamental difference in biological reaction between endemic diseases of geochemical nature and mass poisoning with chemical toxicants and thus both problems may have the same solution. Such a solution may be successful when based on fundamental scientifically ground biogeochemical principles, established by Vernadsky and Kovalsky for biosphere as a self-organized natural object. In this aspect natural systems leave with no notion of toxicity as a measure of harm. The latter presents a purely anthropocentric, superior and self-relative estimate. No toxic or non-toxic chemical elements do exist in the world but there are different biological effects of the particular doses in the particular species in particular forms and in the particular time periods (known since Paracelsus time). Biological effects vary according the Kovalsky concentration curve being negative at deficiency values, then positive at optimum ones and again negative at certain high levels that correspond to toxic poisoning. Living beings contain practically all existential chemical elements, and at least 67 of them are physiologically significant. Natural environments are abundant in different toxicants as components of stable natural ecosystems that do not destroy the vitality of local biocenoses. In this respect the dynamic equilibrium called “biosphere organization” may be treated as a eco-geochemical paradise for all local species. Geochemical poisonings of natural origin occurred due to deliberate violation of boundaries of existing biocenoses in the course of colonization of new areas by man and his accompanying species. Unlike natural ones the technogenic toxicants guarantee certain physiological effects showing themselves against the natural background. Most of toxic zones result from violation of self-organization principles of the primary biosphere and knowledge of these principles can significantly simplify establishing toxic hazard level and minimization of negative consequences. Overlay of technogenic and natural geochemical fields enable spatial evaluation of the toxicity risk due to combination of both factors. The proposed solution is universal and theoretically correct for all the toxic situations.