

Bio-geochemistry of some food contaminants (DDT, PBDE and Hg) and their health risk assessments

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Food safety is one of the current major public health issues in the world. There is a close relationship between soils, food safety and health. Soils have become contaminated due to over exploitation and misuse. Rapid industrialization and urbanization in developing countries have further accelerated the problem, threatening the ability of soils to meet safety standards, and jeopardize food production. Among all contaminants, it is commonly noted that heavy metals and persistent organic pollutants (POPs) are of particular concern, as they imposed health hazards (e.g., cancers with As and dioxins; neurological damage and lower IQ with Pb, As, and Hg; kidney diseases with Pb, Hg and Cd; skeletal and bone diseases with Pb, F, and Cd). However, there seems to be data gap concerning some emerging chemicals of concern, such as flame retardants (PBDEs), which has been recently added in the control list of Stockholm Convention on POPs. It is highly essential to understand (1) soil properties and functions, for better management of contaminants and would-be soil pollutants in the soil systems, with respect to food safety; and (2) the contaminant pathways (from soil to human body), and various factors in determining how much of a contaminant is available to the human body, and for transport in the vicinity. There are sufficient evidences demonstrating the decreasing trends of certain POPs (e.g., DDTs, PCBs, and PCDD/Fs) are linked with effective control. There seems to be a need to establish a list of toxic chemicals which are commonly encountered in our common food items. This presentation will high light some major issues, by citing some regional case studies, focusing on Hg, DDTs and PBDEs.