Mercury in Soils of Metropolitan Areas (by the Example of St. Petersburg)

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Our long-term surveys carried out for many years over the St. Petersburg area have revealed that mercury substantially contributes to the overall soil contamination factor. According to the data of 8000 assays, the mean mercury concentration in the upper layer of urban soils amounts to 0.36 mg/kg, which is 12 times as large as the regional background level. In the downtown area, the degree of mercury contamination in soil is much larger than that caused by other toxic elements in terms of both the concentration factor and contaminated area. The mercury distribution over the metropolitan area is very nonuniform, and even a detailed survey features a high variance of the mercury concentration. For example, the concentrations of toxic metals in soils of adjacent lawns may be due to previous transportation of the ground, its composition, and time of deposition rather than due to industrial emissions. Our experience in surveying the urban areas reveals that, in most cases, the conventional soil survey technique and soil contamination mapping procedure performed in terms of the concentration isolines are insufficiently representative. It is more adequate to assess and compare soil contaminations by the percent ratio of the areas with different concentrations of toxic agents. As a result of the statistical processing of the data of more than 8000 assays, we determined that approximately 1/3 of the mercury deposits in the soil in St. Petersburg is concentrated within 7% of the metropolitan area and 1/10 of that is found within 1% of the most contaminated area.