

## PRELIMINARY ANALYSIS OF THE LEVELS OF PCDDS AND PCDFS IN THE BLOOD OF IRKUTSK REGION RESIDENTS

Elena Grosheva

Institute of Ecological Toxicology, Russian State Committee of Environmental Protection, P.O. Box 48, Baikalsk, Irkutsk region, 665914, RUSSIA

Nina Matorova

Institute of Labour Medicine and Human Ecology, East Siberian Scientific Center of Russian Academy of Medical Science, Angarsk, Irkutsk region, RUSSIA

Zarema Amirova

Scientific Ecological Center of Bashkortostan, 147, October prosp., Ufa, 450075, RUSSIA

### Introduction

The Irkutsk region, which have huge territory (70 millions hectare), is a part of 10 most «dioxin dangerous» areas of Russia. The large enterprises of a chemical, petrochemical, metallurgical and «pulp and paper» industry are concentrated on a small part of territory of region. The main aim of our study is the study of the levels PCDD/PCDF in the human blood.

### Materials and Methods

By the most dangerous enterprises, which discard PCDD/PCDF in an Environment and which influence on the people (professional workers and population of cities), are the enterprises, which make PVC and process chlorophenolic substances (tt. Sayansk and Usolje-Sibirskoe).

The pulp and paper complexes, aluminium factories and others enterprises are located in other large cities of Irkutsk region. In cities of Irkutsk region there are also many Heat Power Stations.

The first analyses of inhabitant's bioliquids (blood and human milk) of Irkutsk region were made by the initiative of Prof. Arnold Schechter in 1986 and it have not shown the high levels for such cities as Baikalsk (Baikalsk Pulp and Paper Mill), PCDD/PCDF TEQ in human blood was 18 ppt, lipid. [1].

The levels PCDD/PCDF was carried out by a method of isotope dilutes according to a method US EPA 1613. The degree of extraction PCDD/PCDF made 60-90%. As the internal standard used a composition from 16 marked analogues toxic PCDD/PCDF (Cat. No EDF-8999 Cambridge Isotope Lab.). The measuring system consist from chromatographic device Carlo Erba 8035 and Mass-Spectrometer Autospec-Ultima (VG), there were used a device DB-5 MS (J&W Sciencs), 60 m. MDL make 0.5-3.0 ppt depending of isomer.

## Results and Discussion

Nevertheless, the medical researches show, that population's health of region is worsened, and it depends not only on decrease of a vital level. The violations of immunity systems, reproduction function and new-born condition deviation in psychological and physical development) are shown in region strongly. 3-15 % of children from industrial cities of region are born with hereditary pathologies and further they have abnormal evolution. There are most low percent of healthy children, which not having any functional deviations and chronic diseases, (13-17 %) in cities Sayansk, Usolye-Sibirskoye (PVC, chemical industry), Shelekhov (aluminium industry), Bratsk (aluminium and pulp-paper industry).

The systematic researches of environmental pollution of Irkutsk region by priority pollutants did not carry out practically.

The Third International Meeting of the Scientists, Politics and Representatives of Public Organizations, which was devoted to a dioxin problem in Russia, (Dioxin Workshop'98) was carried out in 1998 in Baikalsk. The meeting was supported by J&K MacArthur Foundation. That has enabled to analyse PCDD/PCDF in bioliquids of some representatives of Irkutsk region's population. There were chosen the inhabitants of Irkutsk and Sayansk. From the Sayansk's inhabitants were organized the control group of the donors (in age from 31 till 47 y.o.), which are not smoking, having average and high medical education, and which were not having the professional contact with toxic substances and etc. The individual analyses are executed for the worker of Sayansk factory «Khimprom» and doctor, which service the workers of this factory.

The firemen, who have liquidated a fire at the Cable Factory in 1992, were included in group of the donors of Irkutsk region (They are in the age from 30 till 50 y.o. (2 modular tests and 7 individual)).

The levels of PCDD/PCDF's in the samples of whole blood of the Shelekhov and Sayansk's inhabitants were (in TEQ) from 24.7 up to 31.0 ppt in lipids, whereas in blood of the firemen who have lost health after a fire at the Cable Factory in 1992, were in limits from 35.8 up to 42.6 ppt in lipids.

The similar canvas was observed at selective inspection of the samples of whole blood of the Sayansk's inhabitants. In control group (n = 11) the concentration PCDD/PCDF has made 27.8 ppt. In blood of the people, which connected with the production of PVC, the levels raise accordingly: at the doctor serving the worker up to 43.6 ppt, at the worker up to 76.2 ppt in lipids of the blood. In both cities the main contribution in TEQ (up to 40 %) make in 1,2,3,7,8-PCDF, the contribution 2,3,7,8-PCDD and 1,2,3,7,8-PCDD also very high: sum is about 30 % from TEQ.

The preliminary study of the PCDD/PCDF's levels in blood of the Irkutsk region inhabitants and the medical supervision show the necessity of the systematic control of these pollutants for people's bioliquids, especially of the professionals, which connected with chemical manufacture, and also detailed study of levels PCDD/PCDF in an Environment and meal's products.

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## References

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