

## Monitoring of Persistent Organic Pollutants in Environment of Slovak Republic

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**Abstract.** In the article monitoring results of POPs in selected parts of environment are presented. Ten of twelve POPs were monitored in the Slovak Republic. The monitoring was provided by workers of the Ministry of Agriculture SR, the Ministry of Health SR and Ministry of Environment SR.

Apparently, obtained results from monitoring of food and biota do not reveal a discontented situation. There is not even a documentary negative trend, but this problem must be taken into consideration in order to minimize penetration of POPs into food chain and consecutively into consumers diet.

**Key words:** perzistent organic pollutants, monitoring, soil, food, feed, water

Persistent Organic Pollutants (POPs) are chemical substances that remain intact in the environment for long periods. They become widely distributed geographically and accumulate in the tissue of plants and living organism. However they are toxic to humans and wildlife their persistence enables them to be transported by air, water to remote regions where they have never been used. Chemicals as dioxins, polychlorinated biphenyls and organochlorinated pesticides can be ranged into this group.

It was observed an interesting coherence among exposure to POPs and a wide range of effects on human health including cancers, skin disease, nerve and mental disturbance, exchange of immune system, reproductional disturbance, etc. These substances act as a greatly negative in human tissues. Above mentioned compounds can be cumulated in human milk and post-leak into the sucklings bodies. Even in minimal concentrations they have significant impact on the development of brain.

Although POPs include a wide range of chemicals, much of the research is directed toward 12 chemicals that include 3 main groups (by International Programme of Chemical Safety, 1995):

- **Pesticides** - Aldrin, Chlordan, DDT, Dieldrin, Endrin, Heptachlor, Mirex and Toxafen
- **Industrial chemicals** - Hexachlorbenzene and PCBs
- **Unwanted by-products of various industrial processes** - Dioxins and Furans [1].

Ten of twelve POPs were monitored in the Slovak Republic. Following table of monitored POPs in several parts of environment was worked out on the basis of the studied analyses.

The main aim of POPs monitoring was to give in detail analyse of their actual situation in all parts of environment and human population and to prepare a proposal for their future monitoring.

The specific aim was to summary the condition of existing information on monitoring of POPs in environment and human population of Slovakia and to evaluate the relevance of this subject to Environmental Monitoring in the Slovak Republic.

Following sections dealing with POPs monitoring at present:

- Environmental section
- Health section
- Agricultural section

Monitoring of POPs within the framework of the environmental department is engaged by the Geological Survey of Slovak Republic and Conservation and Slovak Hydrometeorological Institute. These organizations are able to carry out monitoring of POPs in surface water, waste water, sediments and water living being creatures.

The POPs are monitored at health department by the Institute of Preventive and Clinical Medicine, State Health Institute of Slovak Republic and eighteen Health Care Institutions. These organizations are dealing with monitoring of foods, air, water, sediments, human milk and human materials.

Monitoring of POPs at agricultural department is performed by Central Control and Testing Agriculture Institute, Research Institute of Water Management, State Veterinary and Food Administration, Institute of Soil Science and Conservation, the Slovak Water Management Enterprise and its organizations (The Hron River Basin, The Vah River Basin, The Danube River Basin, The Bodrog and Hornad River Basin, Hydromeliorácie) and the Food Research Institute. The agricultural department ensures monitoring and analysing soil, sediments, water, feeds, water and forest animals and different types of foods.

General 26 organizations were assigned to the monitoring of POPs which provide results of analysed and



Table - Summary processed questionnaire about several commodities

Commodity	Aldrin	Chlordan	DDT	Dieldrin	Endrin	Heptachlor	HCB	Mirex	Toxafen	PCB	Dioxins	Furans
Emissions										x	x	x
Ground-water	x		x	x	x	x	x			x		
Surface-water	x		x	x	x	x	x	x	x	x		
Irrigation water	x		x	x	x	x	x			x		
Feed water										x		
Drinking water	x		x	x	x	x	x			x		
Wastewater	x		x	x	x	x	x			x		
Rain water										x		
Recreational water	x		x	x	x		x			x		
Agricultural soil	x		x	x	x	x	x			x		
Anthrophogenic sediments	x		x	x	x	x	x	x	x	x	x	x
Wastes		x	x	x	x	x	x			x		
Plant production	x	x	x	x	x	x	x			x		
Animal feeds	x		x	x	x	x	x			x		
Water living being animals			x			x	x			x		
Forest animals and birds			x				x			x		
Animal production	x	x	x	x	x	x	x	x	x	x		
Human milk			x				x			x	x	x
Human material			x				x			x		
Foods and drinks	x	x	x	x	x	x	x			x		
Another	x	x	x	x	x	x	x			x	x	x

x

Additional initiative monitoring

evaluated contents of aldrin, chlordan, DDT, dieldrin, endrin, heptachlor, HCB, PCB, dioxins and furans.

Average findings of monitored chemicals do not shown values approaching required limits. Only PCBs, aldrin, DDT and HCB were monitored regularly. Others POPs were monitored only occasionally (endrin, dieldrin a heptachlor), or not at all (mirex, toxafen).

POPs in agricultural soil have exhibit a decreasing tendency. Results of point charging soils show high concentration of PCBs only.

Apparently, obtained results from monitoring of food and biota do not reveal a discontented situation. There is

not even a documentary negative trend, but this problem must be taken into consideration in order to minimize penetration of POPs into food chain and consecutively into consumers diet [2].

## References

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