

PCBs, dioxins, and PAHs in sediments of River Labe, River Bílina, and Klíšský water stream in Ústí nad Labem metropolitian area

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Introduction

- PCBs, PCDDs, PCDFs, and PAHs POPs
- POPs: bioaccumulation, omnipresent around the world, persistence in nature, toxic, Stockholm Convention
- PCBs: 209 congeners, produced intentionally (coolants, transformer oil, plasticizers in paints, pesticide extenderslubricating oil and more) former Czechoslovakia -Chemko in Střážské 20 000 t PCBs, production terminated in 1984

- PCDDS and PCDFs: together 210 congeners, produced only unintentionally – chlorine production, waste incineration PAHs: 150 homologues, natural and antrophogenic production, produced mostly unitentionally - combustion and heating of organic materials, from coal-tar and asphalt - our aims: 1) monitoring of POPs in area, 2) help to detect of PCBs source in River Labe





Sampling and analysis

- content in river sediments
- 4 sampling sites in Ústí nad Labem metropolitian area: River Bílina in Trmice, Klíšský water stream at the mouth, the confluence of River Bílina and River Labe, and River Labe in Valtířov
- on 28th of August 2015
- analysis in accredited laboratory using HR-GC-MS
- 6 PCB indicator congeners, 12 PCBs dioxin like congeners, 17 PCDDs/PCDFs congeners, and 16 PAHs homologues - calculating I-TEQ and WHO-TEQ







PCBs concentrations

- elevated in spring 2015 by state company Watershed Labe and Czech bv **Environmental Inspection**
- 6 PCBs congeners exceeded Czech limit value for agricultural soil (10 µg PCB/kg DW) at all samplig sites
- the average concentration of river sediments in Czech Republic (14.6 μq PCB/kg DW)
- the background concentration in Czech Republic (2 µg PCB/kg DW)
- the highest on confluence of rivers, the second on Labe in Valtířov than on other two localities (for both indicator and dioxin like PCBs)
- the source of contamination; not located on River Bílina and Klíšský water stream





0 0



100%

PCBs congeners

- difference between localities (Bílina River in Trmice and Klíšský water stream X the confluence of rivers and Labe River in Valtířov) – congener PCB 28
- different profiles of dioxin like PCBs at all
- corroborate sourc of contamination is not located on River Bílina or Klíšský water stream
- of contamination the sourc not is Spolchemie (a chlorine production plant) - we can not identify the source of PCBs
- Czech Environemtnal Inspection: the source is located uppstream of River Labe channel dredging and remobilisation of PCBs accumulated in sediments - but is it the only source?





					90% -	L			
	River Bílina in	Klíšský water	the confluence	River Labe in	80% -				
	Trmice	stream at the	of River Bílina	Valtířov	70% -				
		mouth	and River Labe		60% -				
PCB I-TEQ	28 70	15 70	202.22	54 57	50% -				
[8/8]	20,70	15,72	505,52	54,57	40% -	<u> </u>			
dioxin I-TEQ					30% -	<u> </u>			
[ng/kg]	1,04	21,38	17,23	1,33	20% -				
					10% -			_	
total I-TEQ	20 - 1	25 40	220 55	== 00	0% -				
[lig/kg]	29,74	37,40	320,55	55,90		River Bílin	а	a Klíšský	a Klíšský the
								stream at	stream at of Bílina

Dioxins (PCDDs/PCDFs)

- the highest concentrations: Klíšský water stream and the second highest on the confluence of rivers

- River Bílina in Trmice and Labe in Valtířov: lower concentration similar to background

-the background concentration in Czech Republic (1 ng I-TEQ/kg DW)

- source of dioxins to River Bílina: Klíšský water stream

- potential source on the water stream: Spolchemie (chlorine production plant)

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PAHs

- similar patern of concentrations like for dioxins

- high concentrations at Klíšský water stream and the confluence of rivers, lower for River Bílina in Trmice and River Labe in Valtířov

- criterium for soil by Ministry of the Environment of the Czech Republic for soils ($1\ 000\ \mu g/kg\ DW$)

- benzo(a)pyren at the Klíšský water stream: 1 g of sediment - 20 cigarettes

- homologue profile: Klíšský water stream and confluence of rivers are similar – the same source of PAHs

- the source of PAHs located on Klíšský water stream (usual suspect Spolchemie?)





Conclusion

- the source of PCBs - not only channel dredging, but also paint from a bridge in Ústí nad Labem (we get to know surprisingly at a press conference) - the source of dioxins and PAHs is located on Klíšský water stream (we are going to submit our results to Czech Environmental Inspection - the most probably source of dioxins and PAHs is Spolchemie











GLODAL CHEENGRARIS

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http://english.arnika.org



Thank you for your attention Jindřich Petrlík, Arnika – Toxics and Waste Programme