

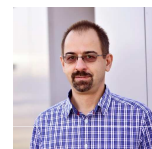
"Chemodynamika znečištění životního prostředí"

Chemodynamics of environmental pollution" research group

branislav.vrana@recetox.muni.cz; gerhard.lammel@recetox.muni.cz

Doc. Branislav Vrana: **Aquatic Chemistry/Akvatická chemie**

Prof. Gerhard Lammel: Air pollution / atmospheric cycling of pollutants

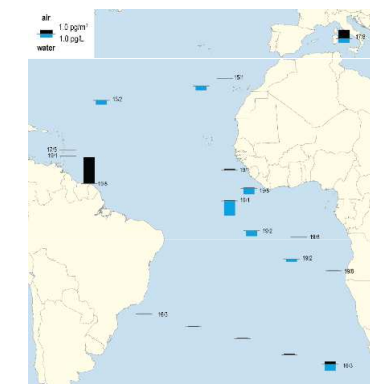
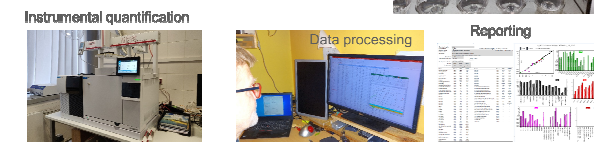
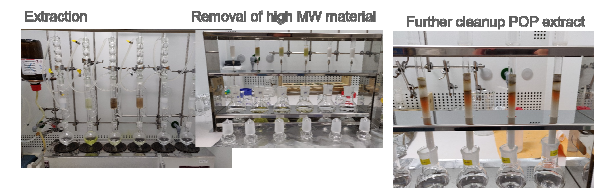


Courses/Výuka doc. Vrana

- E5040 Environmental Compartments and their Pollution/ Složky životního prostředí a jejich znečištění
- E5041 – Cvičení k E5040
- E0330 Good Laboratory Practice/Správná laboratorní praxe
- C3705 Správná laboratorní praxe v chemické laboratoři

Research topics/výzkumná témata

- Bioaccumulation and biomagnification of POPs in aquatic food chains
- Relationship between composition and effects of complex mixtures of aquatic pollutants
- Global distribution of POPs and other organic pollutants in the hydrosphere
- Accumulation in textiles and release by laundry as an emission pathway for aromatic amines from indoor environments to waste- and surface waters
- Effectiveness of wastewater treatment to remove organic contaminants
- Human exposure: Permeation of polycyclic aromatic hydrocarbons through protective clothing
- Human exposure: Silicone wristbands to assess dermal exposure to chemicals

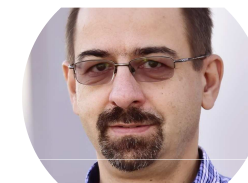


Chemodynamics of environmental pollution

Cooperations with: University of South Bohemia in České Budějovice – Roman Grabic,

RECETOX – Assoc. Prof. Hilscherová

NORMAN association, International Commission for the Protection of the Danube River (ICPDR), NIVA (Norway) and others



Watch your Danube PI: Branislav Vrana

Aim: Analytical and bioanalytical assessments of organic micropollutants using a combination of passive sampling, bioassays and non-target screening

Methodology: field measurements, passive sampling in water and sediment, target and suspect screening chemical analysis, bioanalytical tools

Achievement: Setting up the baseline for representative monitoring of trace organic pollutants in large water bodies. Identification of toxicity drivers in complex mixtures.



Mobile dynamic passive sampling of trace organic compounds: Evaluation of sampler performance in the Danube River

Branislav Vrana ^{1,2,3,4}, Poppe Smedes ⁵, Jan Allan ⁶, Tatjana Rusina ⁷, Krzysztof Okonski ⁸, Klára Hilscherová ⁹, Jiří Novák ¹, Peter Tarabok ¹, Jaroslav Slobodník ⁴



Application of equilibrium passive sampling to profile pore water and accessible concentrations of hydrophobic organic contaminants in Danube sediments¹⁰

Michaela Belháčová-Minaříková, Poppe Smedes, Tatjana Rusina, Branislav Vrana¹¹

Masaryk University Faculty of Science, Center RECETOX, Brno, Czech Republic



Effect-based monitoring of the Danube River using mobile passive sampling

Jiří Novák ¹, Branislav Vrana ², Tatjana Rusina ³, Krzysztof Okonski ⁴, Roman Grabic ⁵, Petra A. Neale ^{6,7}, Beate L. Escher ^{8,9}, Miroslava Mazová ⁸, Selim Alt-Aïssa ⁸, Nicolas Crouzet ⁸, Jan Allan ⁶, Klára Hilscherová ^{1,2,4,11}

Chemodynamics of environmental pollution

Cooperations with: University of South Bohemia in České Budějovice, NORMAN association, International Commission for the Protection of the Danube River (ICPDR), NIVA (Norway) and others

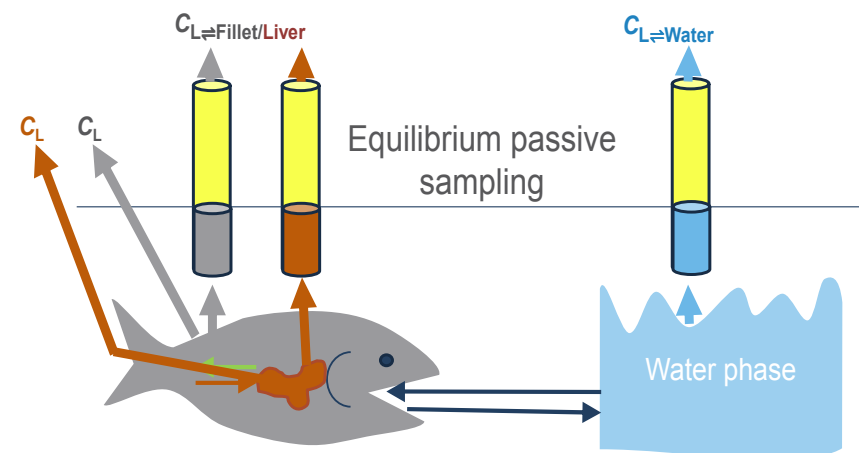


PI: Branislav Vrana

Aim: Investigation of the relationship between concentrations of hydrophobic organic contaminants (HOCs) in freshwater fish at different trophic levels and in water using passive sampling

Methodology: field measurements, passive sampling in water and fish, chemical analysis

Achievement: The trophic magnification in freshwater food chains rarely amplifies levels of persistent HOCs in fish above those in the surrounding environment.



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Article

Unraveling the Relationship between the Concentrations of Hydrophobic Organic Contaminants in Freshwater Fish of Different Trophic Levels and Water Using Passive Sampling

Foppe Smedes,* Jaromír Sobotka, Tatsiana P. Rusina, Pavla Fialová, Pernilla Carlsson, Radovan Kopp, and Branislav Vrana

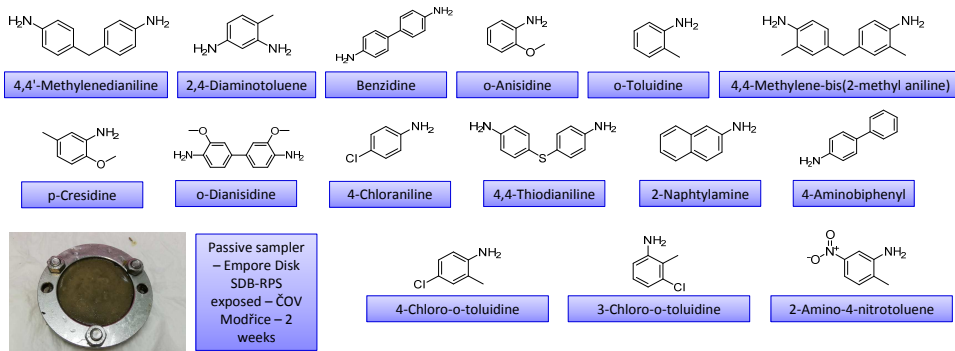
Chemodynamics of environmental pollution

Cooperations with: UFZ Helmholtz Centre for Environmental Research Leipzig



PI: Branislav Vrana

Investigating pathway of mutagenic amines to surface waters



Sorption to textiles

Distribution in laundry water

Reach sewer system

Reach surface waters



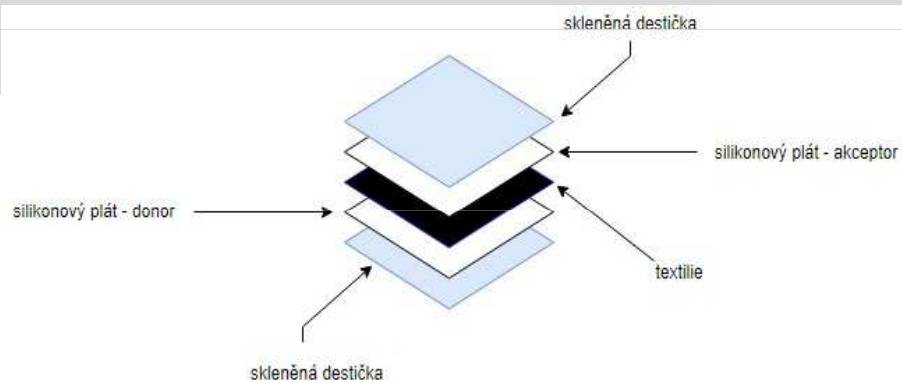
Chemodynamics of environmental pollution

Cooperations with: Dekonta, a.s.

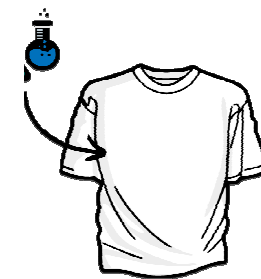
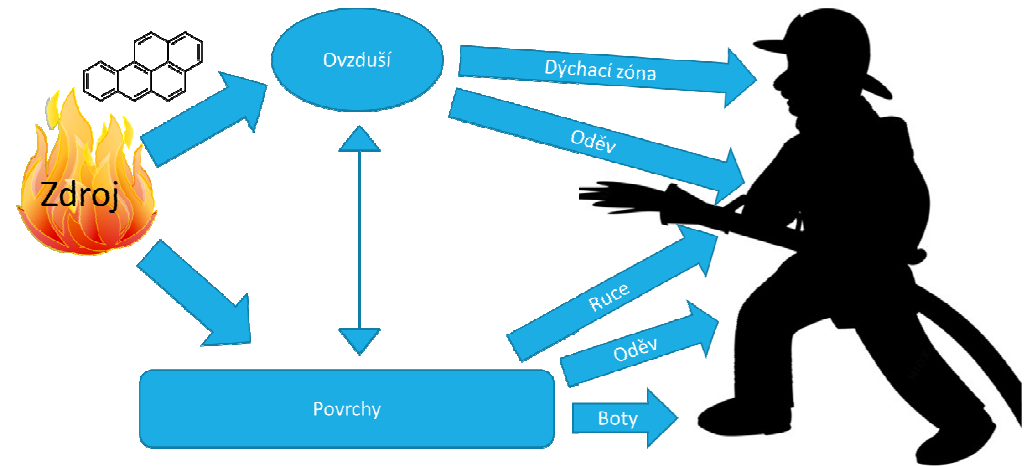
Testování přestupu polycyklických aromatických uhlovodíků textiliemi

Textil může sorbovat chemické látky z prostředí

- ⇒ bariéra mezi vnějším prostředím a kůží
- ⇒ možnosti ochrany před rizikovými látkami při expozici při výkonu povolání příklad – hasiči (PAHs)
- ⇒ => potenciální sekundární zdroj kontaminace



PI: Branislav Vrana



Chemodynamics of environmental pollution

Cooperations with: Univeristy of Rhode Island, Environment Canada, multiple international partners

Aim: Global distribution of POPs and other organic pollutants in the hydrosphere

Methodology: field measurements, passive sampling in water, chemical analysis

Achievement: Established global monitoring network AQUA-GAPS/MONET

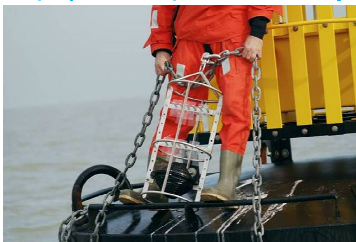


PI: Branislav Vrana

Field deployment
mount the samplers



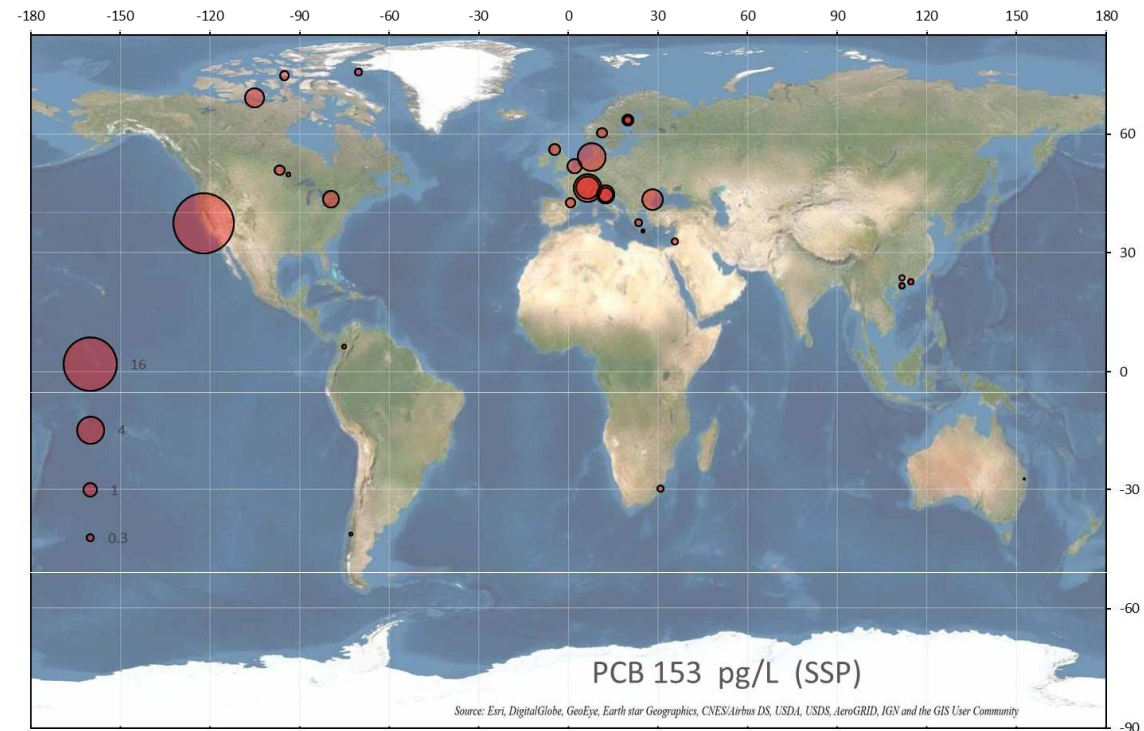
deploy the samples from a buoy



or a bridge



samplers get fouled and need to be cleaned



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Simona
Krupčíková
Pavla
Fialová

Foppe
Smedes

Tanya
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Míša
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Jaromír
Sobotka

Jakub
Urík