



RECETOX NEWSLETTER

RECETOX NEWSLETTER is a quarterly newsletter by the Research Centre for Toxic Compounds in the Environment (RECETOX), Brno, Czech Republic.

Learn,
discover,
prove
and apply



RECETOX is an independent Research Centre for Toxic Compounds in the Environment operating within the Faculty of Science, Masaryk University, Brno, Czech Republic.

RECETOX fulfils three functions: academic institution providing university education, research institution working on transformation of the research into practical applications and a body supporting implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) and of the sound chemicals management in general nationally and internationally.

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- Activities of the Regional Centre



Foreword

Dear readers,
welcome to the first issue of the Newsletter published by the Research Centre for Toxic Compounds in the Environment, Faculty of the Science, Masaryk University Brno, Czech Republic.

We are glad to see our research Centre growing steadily for a few years now. Size of our staff rises in line with increasing amount of projects, scientific papers and new applications – methodologies, patents and technologies – as well as other activities related to persistent organic pollutants, science and curricula in the environmental chemistry and toxicology both nationally and internationally.

We would like to achieve that this newsletter would serve all – not just employees of the centre and students of the Masaryk University, but also other scientific institutions and our partners – and would represent a concise source of information on all components of our activities. We have realized that continuous growth and development of the Centre somehow blurs the whole picture that each individual may have on the Centre's activities outside his/her individual projects and therefore we all might miss out certain information or links.

This newsletter will therefore consist of four parts – news from the Centre, our research, education and infrastructure open access, management of the toxic chemicals in the Czech Republic and activities of the Stockholm Convention Regional Centre. You will get such news from us every three months including invitation to forthcoming events we organize or take part in.

We hope that this inauguration number will be of interest to you and we look forward to hearing your views.

Enjoy reading!

Katka Šebková on behalf of the editors of the newsletter

PS – RECETOX NEWSLETTER is also available automatically if registered through www.recetox.muni.cz or newsletter@recetox.muni.cz

News and Events calendar

- 17–19 June 2013 [Special Workshop in Humpolec – 25 years of Košetice Observatory](#)
- 23–29 June 2013 [9th International Summer School on Environmental Chemistry and Ecotoxicology](#)
- 28 July – 2 August 2013 [International Conference on Mercury as a Global Pollutant](#), Edinburgh, UK
- 25–30 August 2013 [33rd International Symposium on Halogenated Persistent Organic Pollutants and POPs – DIOXIN 2013](#), Daegu, Korea
- 17–20 September 2013 [Meeting of the ROG and GCG Stockholm Convention in RECETOX](#), Brno, Czech Republic
- 14–18 October 2013 [9th Meeting of the Persistent Organic Pollutants Review Committee](#), Rome, Italy
- 6–8 November 2013 [12th International HCH & Pesticides Forum](#), Kiev, Ukraine



Part I. About RECETOX

About us briefly

We are RECETOX, which is an independent Research Centre for Toxic Compounds in the Environment operating within the Faculty of Science, Masaryk University, Brno, Czech Republic.

RECETOX fulfils three functions: academic and educational institution, research institution working on transformation of the research into practical applications and a body supporting implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) and of the sound chemicals management in general nationally and internationally. We have over 130 staff working in the new pavilion A29 where we have moved into in October 2012. The pavilion holds 52 laboratories, 39 offices, 2 lecture rooms, 1 meeting room and 10 technical (building facilities and services) rooms.

At present, the Centre is composed of four research programmes, three core facilities of the research infrastructure and two application bodies. All research and application units are supported by the Centre's well-established effective and efficient management team.

The scientific activities of the Centre are carried out in eleven working groups collaborating within the framework of four research programmes:

1. Environmental chemistry and modelling
2. Organic photochemistry and supramolecular chemistry
3. Protein engineering
4. Ecotoxicology

State of the art research infrastructure is effectively distributed among research teams; in addition, some infrastructure has been centralized in three core facilities:

1. Trace Analytical Laboratories
2. GENASIS information system
3. ELSPAC database

Information on the two application bodies is provided in the part III and IV of the newsletter.

More detailed information about RECETOX is available in our brochure available through our website in the menu information materials (<http://www.recetox.muni.cz/index-en.php?pg=information-materials>).

RECETOX news

Two new RECETOX professorships

June 2013 brought the highest academic titles to two additional RECETOX's prominent scientists – Ms. Jana Klánová and Mr. Luděk Bláha and thereby rounded the number of professors in the Centre to ten. We wish both Jana and Luděk every success both in research as well as in life. Congratulations!

CETOCOEN project evaluation

International evaluation of the CETOCOEN project took place in our premises 12–13 June 2013. Three evaluators – Ms Dagmar Gombitová, Dr. Philippe Garrigues and MUDr. Radim Šrám, DrSc., have spent two full days in a marathon of presentations, excursions to laboratories and Centre's premises and meetings with the Centre's staff and students. CETOCOEN project had built the new pavilion A29, current seat of RECETOX, and provided state of the art instrumental equipment for all research programmes. As soon as the evaluation report becomes available, it will be published on our website.

Košetice observatory celebrates its 25 years of operation and new global observatory launch

RECETOX, CzechGlobe and Czech Hydro Meteorological Institute have organized the international conference “Košetice 25” on launching new global observatory and celebrating 25 years of monitoring of environmental compartments in the background observatory in Košetice. The conference took place in Humpolec 17–19 June 2013. More information is available on the RECETOX website.





Part II. Research and Education

Research

As described above in the part about us, we have four research programmes. Environmental chemistry, ecotoxicology, physical chemistry, analytical chemistry, organic chemistry and organic synthesis, mechanistic studies, kinetics and modelling, risk assessments, statistics and programming generate data and develop tools or approaches for our further use.

Our research focuses on interactions among chemicals, environment, and biological systems, including consequences at local, regional and global levels. We develop new approaches to study environmental distribution, transport, bioaccumulation and effects of contaminants, incorporating environmental and human risk assessment, environmental modelling, biostatistics and informatics. Expertise available in the Centre allows us to investigate interdisciplinary links between the contamination of ecosystems and health, biodiversity, or climate change, perform regional impact assessments, and develop water rehabilitation technologies and soil remediation methods.

RECETOX has undertaken 46 research projects (12 international and 34 national) in 2012. Financial support has been obtained from 13 subjects (5 international and 8 national institutions) within 20 funding programs.

Outputs available are peer-reviewed papers in journals and visualization portals and other publications such as books or reports. In addition, we generate a number of other outputs that transform science into practice – such as methodologies or procedures to be used in the control of the legislation, patents, new breeds or specific maps that would serve for decision makers.



Education

RECETOX provides university education in three distinct majors: environmental chemistry, ecotoxicology and computational biology, at all three levels of higher education: bachelor (BSc), master (MSc) and doctoral (PhD), at the Masaryk University Faculty of Science.

Our curricula is based on environmental practice and is performed in close cooperation with partners from industry, the private sector, NGOs and relevant research institutions. Innovation of the education curricula has been supported by two European Social Fund project RECETOX Education (Operational program Education for Competitiveness) for the period of 2011–2014. There are 14 new courses that have been introduced recently and they focus on linkages and cooperation with the practice – waste management including case studies, life cycle assessment approach, policy and tools in environment protection, life cycle approach, remediation and others. Moreover, the new courses allow for direct interaction with the application sector, study visits and excursions as well as specific internships with our partners in industry.

Master Theses Defences in June 2013

End of the academic year brings always defences of master and bachelor theses. This June, a total of 31 students of master's degree in environmental chemistry, ecotoxicology or computational biology have defended their theses. This academic year 2012–2013, however, was a bit different from previous ones due to moving out of one building and opening up new laboratories including some new equipment within the same academic year. "Despite the move and some unexpected layby in February the quality of environmental chemistry theses have matched the standard in recent years," informed Zdeněk Šimek, senior researcher and environmental chemistry research group leader.

This year's defences of ecotoxicology diploma theses mirrored a wide range of expertise available in RECETOX. Master theses dealt for example with ecotoxicity of pharmaceuticals and substances produced by cyanobacteria water blooms in the environment or explored topics related to the assessment of bioavailability and ecotoxicity of pollutants in forest soils. The interest of many students in their research topics is confirmed by the fact that a number of them would like to continue their education in RECETOX through their doctoral degree.



Part II. Research and Education

RECETOX infrastructure

RECETOX research infrastructure has been developed in recent years with support of the CETOCOEN project (no. CZ.1.05/2.1.00/01.0001) from the European Regional Development Fund of the European Regional Development Fund, Operational Programme Research and Development for Innovations and as a result we moved into new premises in October 2012.

Infrastructure open access

RECETOX research infrastructure has been included in the Czech Roadmap of Large Infrastructures for Research, Development and Innovation endorsed by the Czech Government in 2010. RECETOX research infrastructure is also openly accessible to the external research community, both nationally and internationally. Our open access mode also extends to other advanced infrastructure and instrumentation of the Centre. Open access to the RECETOX research infrastructure is supported by the project granted by the Ministry of Education, Youth and Sports of the Czech Republic (LM2011028).

Application procedure is very simple as describes Petra Růžičková – RECETOX infrastructure coordinator: “It consists of a written motivation letter including project proposal and questionnaire to me, preferably by e-mail. All applications are evaluated by the Scientific Council of the RECETOX and open-access is granted to the best applicants who can spend.”

Form and further details are available on our website www.recetox.muni.cz/RI



What is RECETOX research infrastructure?

Research infrastructure of RECETOX is a combination of facility, state of the art instrumentation and core facilities of the Centre including expertise available from researchers working in RECETOX.

What is open access?

Open access is a possibility to visit and work with all that infrastructure encompasses, provided that the applicant brings in a topic that is compatible with the science performed in the infrastructure and results into a joint project or publication together with RECETOX.

Who visited our centre in 2012?

Sixty-three scientists (59 internationals) from other research institutions used RECETOX infrastructure for a total of 15 working months in 2012. Six students from other universities (abroad) carried work on their research projects in RECETOX for a total of 17 working months (three months per student on average). In addition, further 86 persons who are also employees of other organizations (predominantly industry) worked in RECETOX for 12 working months in total.

What is current situation?

First half of the 2013 has seen 11 international scientists and 1 young researcher from the Czech Republic to RECETOX. Three students – Un-Jung Kim from the Republic of Korea, Erin Markham from USA and Brij Mohan Sharma from India currently study methods of preparation and analyses of water samples and get training in analytical chemistry of POPs (PCBs, brominated diphenyleters and organochlorinated pesticides).

What did they have to say about their experience so far?

Un-Jung came for 6 weeks training and work in May and June. She enjoys enthusiastic atmosphere of studying, researching and communication and especially thanks Dr. Branislav Vrana, Tatsiana Rusina, Jiří Kohoutek and Foppe Smedes for their support and expertise. She closed with: “My stay is really a nice short slot of time to think about true research life in my near future.”

We also look forward to working with you!



Part III. National Centre for Persistent Organic Pollutants

The National Centre for Persistent Organic Pollutants was established in 2005 as a joint activity of Masaryk University and the Ministry of the Environment of the Czech Republic in order to support decision making and implementation of the Stockholm Convention on Persistent Organic Pollutants in the Czech Republic. The National Centre is hosted by RECETOX and provides support in the six following broader areas:

1. Support in implementation of the Stockholm Convention in the Czech Republic
2. Research and development
3. Monitoring
4. Data management – publication and interpretation of data
5. Cooperation with the application sector (government, ministries, industry as well as other stakeholders)
6. Education and Awareness Raising

In addition, the National Centre also supports the use of RECETOX core facilities, in particular the Trace Analytical Laboratories and GENASIS information system and organizes workshops, training and conferences. Another task that the National Centre fulfils is to identify application opportunities and maintain cooperation with stakeholders - industrial partners, private companies, regional and state authorities, as well as scientific and educational institutions, non-governmental organisations and the general public.

Furthermore, as the cooperation and coordination between the three conventions (Stockholm, Rotterdam and Basel) has been fostered in last 4 years, the Centre also provides support for implementation of the other two conventions as well as the newly negotiated Minamata Convention on Mercury. Therefore, the executive body of the National Centre, that is inter-ministerial Council has decided in February 2013 to change the name of the National Centre from the narrow title of persistent organic pollutants to the broader National Centre for toxic compounds. Administrative formalities of this change are currently underway.

Flagship Projects



MONETs and Košetice observatory

Long term monitoring of toxic chemicals started in 1988 in cooperation with the Czech Hydrometeorological Institute at the observatory Košetice, in the region Vysočina, Czech Republic.

A range of environmental matrices (ambient air, atmospheric deposition, dust, plants, sediment, soil, water) is studied through Košetice observatory continuously since 1988 and the site also provides data to global monitoring networks such as EMEP (European Monitoring and Evaluation Programme). The parameters studied are elements and metals, microbiological parameters, organochlorinated pesticides (OCPs), polyaromatic hydrocarbons (PAHs), indicator PCBs, dioxins and furans (PCDDs/Fs) and physico-chemical parameters.

Based on experience gained in Košetice, RECETOX has developed a model monitoring network in the Czech Republic, MONET-CZ, that confirmed a hypothesis that atmospheric passive sampling is a cost-effective option for monitoring levels of persistent organic pollutants able to provide comprehensive results and spatial and temporal trends.

The experience was further transferred to international monitoring networks operated by RECETOX such as MONET CEE that is in operation from 2006, MONET Europe set up in 2009 (atmosphere and soil) and MONET Africa running from 2008 that RECETOX performs through its Regional Centre in cooperation with its international partners and UNEP.





Part III. National Centre for Persistent Organic Pollutants



GENASIS

GENASIS (Global ENvironmental ASsessment Information System, www.genasis.cz) is a complex electronic tool that provides comprehensive information on contamination of the environment by chemicals, namely persistent organic pollutants (POPs). It was created in cooperation of RECETOX with IBA MU, institutes of the Masaryk University, Brno, Czech Republic.

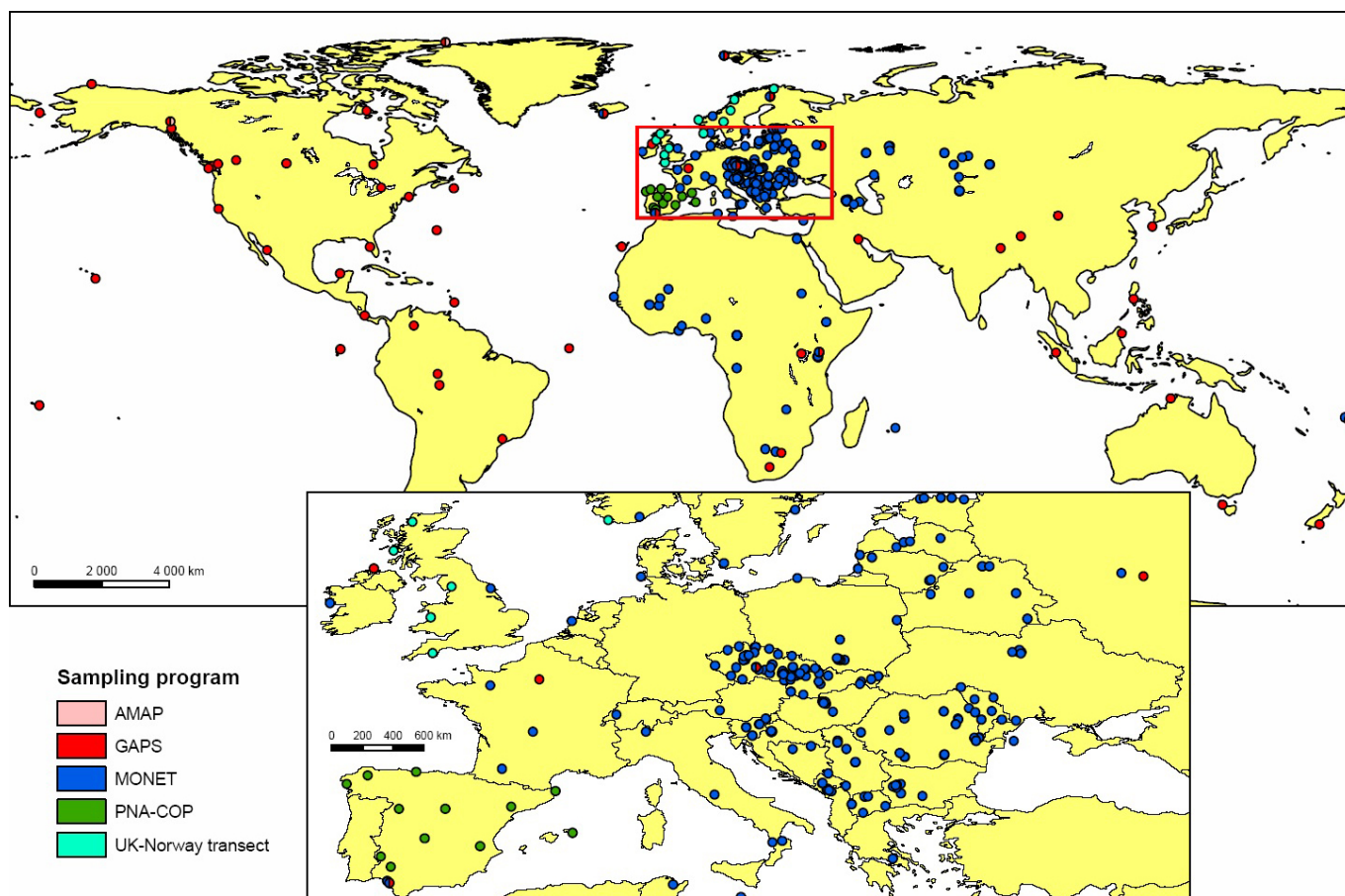
GENASIS can be used for data management, visualisation and interpretation in relation to chemicals and their presence and effects in the environment. It combines expertise, validated data from partner institutions, input from regular environmental monitoring programmes and provides data repository, analytical tools and data management.

Nationally, GENASIS forms an inextricable part of the overall environmental information system and its tools are designed to support in particular the implementation of the Stockholm Convention and other multilateral environmental agreements (MEAs) as well as implemen-

tation of priorities relevant to the state environmental policy.

GENASIS can support regulators and many others in evaluation of effectiveness of the strategic plans and national policies as its design allows assessing anthropogenic effects spatially and dynamically in real time. In addition, information on corresponding ecological and health risks and dynamic changes relevant to the state of the environment complement the above information. GENASIS user thereby receives all available up-to-date information on spatial and temporal trends in POPs concentrations in various environmental matrices (air, water, soil, biota and human tissues) that can be sorted, viewed and further analysed by using three GENASIS on-line tools: information portal, publishing platform and on-line data visualization.

Design and administration of the portal are supported by VaVpI CETOCOEN project.





Part IV. Stockholm Convention Regional Centre for Capacity Building and the Transfer of Technology

The Stockholm Convention Regional Centre for Capacity Building and the Transfer of Technology (hereafter referred to as Regional Centre) in the Czech Republic was endorsed by the decision SC-4/23 by the fourth meeting of the Conference of the Parties to the Stockholm Convention on Persistent Organic Pollutants (COP4) in 2009. The Regional Centre is a part of the RECETOX and provides assistance outside the Czech Republic.

The Regional Centre provides long-term support in chemicals management to 23 countries of Central and Eastern Europe and serves as a strategic scientific partner for over 30 countries in Africa and Asia. The Regional Centre also works as a project partner with UNEP, UNIDO and UNDP to build environmental capacities in developing countries and organizes conferences, workshops, and summer schools. It also provides its scientific capacities, other expertise and long-term experience in finding practical solutions for environmental challenges to all interested stakeholders including other Stockholm Convention Regional Centres, secretariat of the Stockholm Convention (or Joint secretariat of the three conventions) and international organizations.

Main activities

Our Regional Centre provides assistance in the following fields (no order of importance):

- Capacity building and training of both technical staff and decision makers
- Monitoring
- Data generation and efficient data management and use
- International cooperation to support capacity building
- Research projects and joint cooperation
- Implementation of the Stockholm Convention on Persistent Organic Pollutants
- Cooperation with other Regional Centres (SC/BC)
- Awareness Raising
- Cooperation and coordination among global legally binding instruments on chemicals management as well as other related tools – synergies
- In addition, the Centre also organizes training, workshops and conferences.

Projects

Key projects of the Regional Centre in the past year were the establishment of a system monitoring air quality in Africa (MONET Africa) and a project to develop a software tool for data collection, visualisation and interpretation of monitoring data resulting from the Global

Monitoring Plan of the Stockholm Convention on Persistent Organic Pollutants please see below.

In addition, a number of specific training activities occur each year in our premises.

Portal for Visualization of the Global Monitoring Plan of the Stockholm Convention on Persistent Organic Pollutants

RECETOX in cooperation with the Institute of Biostatistics and Analyses (IBA), both Masaryk University, Czech Republic, have successfully developed the complex software and visualisation tool for global levels of the Stockholm Convention contained persistent organic pollutants in the atmosphere and human tissues (human milk and blood). The portal is located on the web site www.pops-gmp.org and comprises of three descriptive tools (geographic coverage in time and data availability according to individual compounds and years) and three analytical tools (values reported from background sites, demonstration of a 6-step validation of data from ambient air monitoring, and inter-regional variability in concentrations of selected compounds). The outputs from the portal are available for download as graphic files (PNG format) or tables for MS Excel.

Data currently available is information provided into the regional monitoring reports approved. Core matrices collected for determination of POPs levels were ambient air and human tissues (milk, blood). In addition, further data from other public sources such as large environmental monitoring programmes (EMEP, AMAP, IADN) are also available.

Training for monitoring specialists, in particular to the members of Regional Organization Groups and Global Coordination Group, related to the data collection for the 2nd GMP report that will be prepared for the COP7 (2015) will be held in RECETOX in September 2013 and further activities are underway.

Training of experts and joint projects

Regional Centre provides specialized short term and long term training and education to a range of stakeholders - from experts and researchers to decision makers. Made to measure training provide both theoretical and practical expertise in POPs analyses including operation of laboratory instrumentation, their identification, information on properties, behaviour, effects, risk assessment and generation and management of data including their interpretation.



Part IV. Stockholm Convention Regional Centre for Capacity Building and the Transfer of Technology

International Summer School

Our flagship training activity is the International Summer School focusing on toxic compounds in the environment. Since 2005, a total of 338 experts from 75 countries all over the world gained knowledge and expertise from our summer school (about 55 participants/year) and some of them return repeatedly.

Summer school provides a comprehensive expertise in 6 intensive days organized by RECETOX in cooperation with Secretariat of the Stockholm Convention and the Ministry of the Environment of the Czech Republic in the RECETOX premises. The programme is a balanced

mixture of lectures (by 5-10 invited speakers to provide the latest development in research), workshops and laboratory exercises including validated methods, QA/QC standards, preparation and analyses of the samples and training in using laboratory equipment and other gear for sample collection and handling. In addition, a field trip to Košetice observatory is also included in the curricula. Each summer school has a specific topic; passive sampling of pollutants in the aquatic environment in 2012 and samplers and human exposure and assessment of related risks is the theme for 2013.

We look forward to welcoming participants of 9th International Summer School!



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