

## *CHEMICAL POLLUTANTS AND BIOLOGICAL SYSTEMS*

*RECETO Ph.D.-course  
20/9 – 2/10 2004  
Brorfelde Fieldstation, Denmark*

The aim of the course is to give the participants a thorough introduction into the interaction between chemical pollutants in the environment and biological systems. The emphasis will be on the toxic effects of pollutants and assessment of chemicals in the environment. The course will introduce the participants to different methods of evaluating ecotoxicity, hereby enabling the participants to perform simple and complex evaluations of pollutants, based on different approaches to environmental risk-assessment. During the course, the participants will prepare a project-report working in small groups of students. The project-work will include different aspects of the interaction between a specific group of chemical pollutants (e.g. heavy metals, endocrine disruptors, pesticides or PAH's) and biological systems, as evaluated by the introduced methods. The course will end up with an oral presentation and a written course report.

### **Target group:**

Ph.D.-students with limited knowledge about ecotoxicology and risk assessment of chemicals, but in need to know something about these subjects in relation to their work, or in need of an introductory course before attending more advanced courses in this field. The course will also be beneficial to people from the industry or public administration in need of knowledge about ecotoxicological testing and risk assessment of chemicals.

### **Times and location:**

20/9-24/9: Course preparation at home.  
27/9-2/10: Brorfelde Fieldstation, Observatør Gyldenernes Vej 1 – 13, Tølløse.  
Transport will be arranged from Roskilde train station upon request.

### **Registration:**

Registration and payment, 1 September 2004.

A short description of your research and which types of compounds are of interest must follow with the registration. Based on this information the student groups are combined. The course is limited to 30 students in total.



### **Course fee:**

6,330 DKK for non-RECETO Ph.D.-students, non-Ph.D.-students and Post Docs. The course is free for RECETO Ph.D.-students. In case of open places, master students may attend the course at reduced price. Please contact RECETO for further information. Transport to and from Brorfelde is not included in the price.

### **Course size and material:**

6 ECTS. Course material will be available for download from the RECETO website no later than 15/9 2004.

### **Heads of course:**

Nina Cedergreen: Assistant professor for Ecotoxicology at KVL. Ph.D. in Nutrient Uptake of Aquatic Plants from the Department of Plant Ecology, University of Aarhus, DK in 2000. Has since then worked at KVL with the ecotoxicology of pesticides with focus on the aquatic flora.

Kresten Ole Kusk: Associated professor for Ecotoxicology at DTU. Ph.D. in Plant Physiology and Oil Pollution. Has been working as a private consultant for 10 years mainly with industrial pollution and later at DTU with teaching and research e.g. effects of endocrine disrupters.

## Other Teachers:

### Finn Bro-Rasmussen DTU

Professor emeritus. Risk assessment of environmental problematic chemicals.

### Anders Baun DTU

Associate professor. Environmental chemistry, ecotoxicology and risk assessment of chemicals.

### Philipp Mayer DMU

Senior scientist. Ecotoxicology and risk assessment with focus on exposure and effects of hydrophobic organic chemicals.

### Janeck Scott-Fordsmann DMU

Senior scientist. Ecotoxicology and risk assessment with focus on modelling of transport and degradation.

### Frants R. Lauritsen KU

Professor. Development of analytical chemical instrumentation for on-site, real-time monitoring of the environment.

### Søren Sørensen KU

Associate professor. Evaluation of genetic flow within natural communities and responses to environmental perturbations.



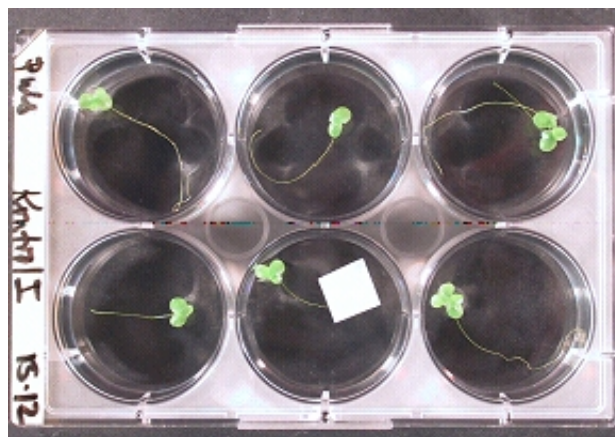
*Daphnia magna* is a standard test organism used for toxicity testing of organic chemicals at the base level in the risk assessment procedure. Acute as well as reproduction tests are performed with this organism, which is cultured in the laboratory for this purpose.

The picture shows a female with young daphnids in the egg pouch.

## Guest teachers:

Several guest teachers are invited for the course (e.g. in biosensors). Please observe any changes in the course programme on:

[http://www.receto.dk/Education/Summer\\_Schools/](http://www.receto.dk/Education/Summer_Schools/)



The standard toxicity test for vascular plants is the *Lemna sp.* test. The picture shows *Lemna minor* placed in nutrient media spiked with toxic compounds. The plants are photographed together with a white square to digitally determine the plant surface area. After 7 days growth the plants are photographed again and area specific growth rates area calculated.

## How do I become a RECETO-Ph.D.-student:

All Ph.D.-students from the EU member states can apply for affiliation with RECETO. Please contact the secretariat on: [receto@kvl.dk](mailto:receto@kvl.dk).

## RECETO

Research School of Environmental Chemistry and Ecotoxicology

A postgraduate school of environmental chemistry and toxicology - molecular studies of pollutant fate and effects in aquatic and terrestrial ecosystems.

RECETO comprises the following partner institutions:

- The Royal Veterinary and Agricultural University (KVL).
- Technical University of Denmark (DTU).
- The Danish University of Pharmaceutical Sciences (DFU).
- University of Copenhagen (KU).
- Lund University (LU).
- National Environmental Research Institute - Denmark (DMU).
- The Geological Survey of Denmark and Greenland (GEUS).
- DHI Water and Environment (DHI).
- Danish Forest and Landscape Research Institute (FSL).
- Danish Institute of Agricultural Sciences (DJF).

Course plan for CHEMICAL POLLUTANTS AND BIOLOGICAL SYSTEMS, Brorfelde Fieldstation 27/9-2/10:

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8:30 - 10:00	Shuttle bus from Roskilde Station to Brorfelde at 9:45 and 10.45.	Introduction to ecotoxicology I	Bioaccumulation and bioconcentration	Methods in ecotoxicology	Risk evaluation I - Introduction and general concepts	Presentation of project works
		Introduction to ecotoxicology II	Toxicity mechanisms I: - General - Pesticides	Bioavailability - biological methods		
10:00 - 10:30	Arrival, registration, quartering.	Coffee, tea	Coffee, tea	Coffee, tea	Coffee, tea	Coffee, tea
10:30 - 12:00	Refreshments	Bioavailability - chemical Methods	Toxicity mechanisms II: - Endocrine disruptors	Biomarkers – Heavy metals	Risk evaluation II - statistical methods	Guest lecture III: REACH
				Factors affecting toxicity		Evaluation
12:00 - 13:00	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
13:00 - 15:30	Introduction to the course	Ecotoxicity - demonstration I (springtails, algae, microtox)	Ecotoxicity - demonstration II (springtails)	Mixed toxicity	Risk evaluation - computational exercises	Departure.  Shuttle bus to Roskilde Station from Brorfelde at 13:00 and 14:00.
	Physical/chemical properties of pollutants					
15:30 - 16:00	Coffee, tea	Coffee, tea	Coffee, tea	Coffee, tea	Coffee, tea	
16:00 - 17:30	Structure-activity relationships	Bioavailability/ exercises	Project work I	Project work III	Project work IV	
17:30 - 20:00	Dinner	Dinner	Dinner	Dinner	Dinner	
20:00 -	Introduction to project work	Guest lecture I: the universal sensor	Project work II	Guest lecture II: biosensors	Project work V	

**Registration form:**

CHEMICAL POLLUTANTS AND BIOLOGICAL SYSTEMS - RECETO Ph.D.-course - 20/9 – 2/10 2004.

Name: \_\_\_\_\_ Institution: \_\_\_\_\_  
Date of birth: \_\_\_\_\_ Address: \_\_\_\_\_  
Position: \_\_\_\_\_  
\_\_\_\_\_  
Country: \_\_\_\_\_

The course is free for me because I am RECETO-Ph.D.-student (students from RECETO partners, including Lund University, and students from EU member states that sign up as RECETO students).

My Ph.D.-topic: \_\_\_\_\_  
(objectives, subprojects, procedures) \_\_\_\_\_  
\_\_\_\_\_

I am a master student from the RECETO partners including Lund University. I am applying for participation in the course at reduced price. Reduced price for master students will only be offered in case of open places after registration has ceased.

Others: The course fee of 6330 DKK must be transferred to Danske Bank (Falkoner Alle 8, DK-2000 Frederiksberg). Registration number: 4530. Account number: 0009000526). Remember to add your name and mark the payment RECETO.

I am interested in the following compounds:  heavy metals,  endocrine disruptors,  pesticides,  PAH's,  other: \_\_\_\_\_

Date: \_\_\_\_\_ Signature: \_\_\_\_\_  
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**Questions and registration to:** RECETO, KVL  
Thorvaldsensvej 40  
DK-1871 Frederiksberg C  
Denmark  
Email: RECETO@KVL.DK