Innovative bioindication methods for observing our environment

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Course description:

For a number of years “classical” programs for environmental monitoring are being supplemented by bioindication measures already. Here, investigations on living organisms or their remains (e.g. peat) are used to indicate the environmental situation in either qualitative (bioindication) or quantitative (biomonitoring) terms. This provides pieces of information on environmental burdens of a region at a given point of time or on its changes with time (trend analysis). Classical bioindication often deals with observation and measurements of chemical noxae (both inorganic and organic ones) in welldefined bioindicator plants or animals (including man). Both for reconstruction of former situations (in retrospect) and the investigation of future trends similar approaches in the field of methods between environmental specimen banks and more general bioindication protocols are used. Thus environmental specimen banks are just one specific instrument of bioindication or biomonitoring, respectively. In terms of analytical procedures and results there are parallel developments between progresses in bioindication and innovation in analytical methods, too.

After some 30 years of development in bioindication there are now following lines of further development:

1) more frequent inclusion of multi-element total analyses for a thorough investigation of mutual correlations in the sense of the Biological System of Elements,
2) 2) more work on (analytical) speciation issues to proceed into real effect-oriented environmental sciences, and
3) 3) there should and must be a focus on integrative bioindication methods because for a large number of environmental monitoring problems a single bioindicator will not provide any meaningful information: a single bioindicator is about as good as none at all. Integrative concepts such as the Multi-Markered Bioindication Concept (MMBC) provide basic means to get into precautionary environmental protection effects drawing upon such a secondgeneration bioindication methodology.

Syllabus of the lecture subjects (enlisted):

Observing the Quality of the Environment

by intelligent biotechnologies –

with special emphasis to inorganic contaminants

1. Environmental Analysis

    - Errors, Quality control

2. Bioindication / Biomonitoring
   - 2.1 Definitions
   - 2.2 Plants
     - Development of Mosses as Bioindicators / Biomonitors
     - Establishing mosses as European indicators
   - 2.3 Environmental Specimen Banking
   - 2.4 Soils
   - 2.5 Animals (Snails)
   - 2.6 Integrated Monitoring
     - Human Hair (without use)
     - Human Milk
     - Food Analysis

TERMINY WYKŁADÓW			
Data	**Dzień tygodnia**	**Godzina**	**Sala**
2013-10-14	Poniedziałek	9-12	LUWR (Chemia A)
2013-10-15	Wtorek	9-12	LUWR (Chemia A)
2013-10-16	Środa	9-12	LUWR (Chemia A)
2013-10-17	Czwartek	9-12	LUWR (Chemia A)
2013-10-18	Piątek	9-12	LUWR (Chemia A)