

Bi2003 Ecotoxicology

Syllabus / Key words for final test (Introduction to Ecotoxicology - lecturer: Ludek Bláha)

- CASE STUDIES AND EXAMPLES - examples of adverse effects at population and ecosystem effects (e.g. DDT, avermectin antiparasitics)
- ADVERSE OUTCOME PATHWAYS (concept and examples - e.g. estrogens)
 - from Bioavailability (definition?, examples?) through Toxicity mechanisms (examples of molecular mechanisms?, examples of toxic effects at cell level?) to Effects at organism, population and ecosystem levels)
- DOSE-RESPONSE - Concentration-response relationships (principles, standard curve for toxicity bioassay, derivation of EC50, LOEC, NOEC)
- TYPES OF EFFECTS at different levels
 - (i) Modes of Action of chemicals at molecular level (some examples of mechanisms?),
 - (ii) Effects of chemicals at cell level (what key processes are affected?),
 - (iii) Effects of chemicals at the organism level (what are the apical endpoints? mortality, reproduction + other chronic),
 - (iv) Effects at population and ecosystem levels (some examples?)
- ASSESSING TOXIC EFFECTS
 - testing of individual chemicals and contaminated samples
 - principles (batteries of assays from different trophic levels)
 - effect assessment (laboratory bioassays - micro/mesocosm - field biomonitoring/bioindication)
- ECOTOXICITY APPLICATIONS - RISK ASSESSMENT
 - What is the principle of "assessment of risks"? What is Hazard? What is Risk?
 - What is the outcome of EXPOSURE assessment (answer: PEC) and EFFECT assessment (answer: PNEC)? How is PNEC derived from toxicity data (answer: by applying assessment/uncertainty factors). How is PNEC projected in legislation (answer: EQS)
 - What is the Hazard Index (or synonymum Risk Quotient)? What is the range of values for HI or RQ? How is it used? (answer: $RQ < 1$ = no risk, no management needed, $RQ > 1$ ==> management of risks needed)
 - REACH legislation example - What bioassays (specific examples) are the most commonly required by legislation?