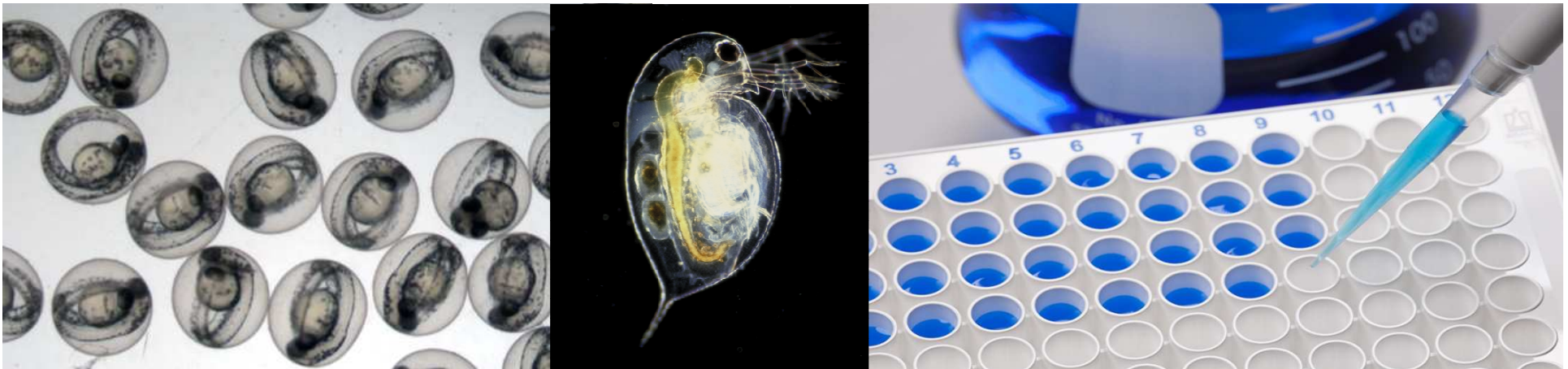


Bioassays monitoring module

Zuzana Toušová

RECETOX – Masaryk University, Czech republic



Outline

1. Introduction
2. Current status
3. EDA EMERGE Project
4. Conclusions

Introduction

Bioassays monitoring

screening of biological effects of emerging pollutants in environmental matrices

- Standard ecotox bioassays – Daphnia, Microtox, FET, etc.
- Receptor mediated bioassays – YES/YAS, CALUX, etc.
- Novel bioassays – gene expression, enzyme activity, inflammatory factors, etc.



**THERE ARE MANY DIFFERENT (TYPES)
OF BIOASSAYS**

Current status – Bioassays monitoring

Data collection template – DCT for water phase

- was developed (focus on EDA EMERGE and SOLUTIONS)
- is being tested with data from EDA EMERGE project
- will be ready for data from SOLUTIONS project

EDA EMERGE Project

- Joint monitoring exercise of EDA EMERGE partners
- Contaminated and reference sites, in 4 European river basins
- Large volume solid phase extraction and whole water grab samples

→ Battery of 10 bioassays



DCT bioassays

Format harmonized with other modules

DATA SOURCE

SAMPLE DATA

BIOASSAYS FIELD STUDIES

- **Basic data** - *results*
- **Metadata** - *quality-related information*

Results of bioassays

Biological effect equivalents – E2-EQ, Dex-EQ [ng/L]

EC_{50} , EC_{20} , EC_{10} , $EC_{IR1.5}$ LOEC, NOEC – how to express the concentration?

→ **REF (*Relative enrichment factor*) concept** proposed by *Escher et al., 2006*:

How much do we have to pre-concentrate the sample reach biological effect ?

Results of bioassays

Interpretation of REF

- REF > 1: sample is enriched in the bioassay (e.g., a REF of 10 means the sample was concentrated 10-fold in the bioassay)
- REF < 1: sample was diluted in the bioassay
- REF = 1: equivalent to the concentrations of organic micropollutants in the ambient (un-diluted and un-concentrated)

Metadata

- **What kind and amount of metadata do we need for minimum quality?**

Each bioassay – different key parameters affecting the results
e.g. Algal assays – light conditions, receptor mediated assays – reagents

Asking for too much metadata can discourage the data providers

Scoring system to assess the quality of each datapoint – is being developed

Conclusion

- Collection of effect data from bioassays monitoring is very important complement to chemical analyses of emerging substances
- Well-designed DCT will be crucial for successful collection of larger datasets
- Flexible DCT formats for different monitoring projects – close communication of data providers and data collector(s)
- Final DCT format should be known to the data providers **BEFORE** the data generation
- Automation of the whole process is questionable ???

A wide-angle landscape photograph showing a deep valley. In the foreground, there are lush green bushes and trees. The middle ground features a winding river, a large green field, and a road. The background consists of forested hills with prominent grey rock formations. The sky is overcast with soft clouds.

Thank you for your attention