

AQUATIC ECOTOXICOLOGY AND ECOLOGICAL RISK ASSESSMENT

DESCRIPTION

Ecotoxicology is a multidisciplinary science which aims to **assess how interaction between pollutants and the environment affects ecosystems**, taking into account the susceptibility of individuals, populations and communities to be affected by and recover from any type of toxic stress. Assessing ecological risk from pollutants requires preliminary research into the emission and transport of contaminating substances in the environment and the exposure to which live organisms may be subjected. Likewise, laboratory and/or field experiments help evaluate the toxic effects caused by different pollutants and exposure patterns. Finally, the results of these studies are combined to calculate the likelihood of ecosystems being affected by the use of potentially toxic substances.



Ecotoxicology and environmental risk assessment are applied in different fields:

- **Recording and evaluating chemical substances**

Currently, any chemical substance launched in the market must undergo ecotoxicological assessment beforehand. Several European and national regulations (e.g. REACH) lay down basic criteria and guidelines on how this evaluation should be carried out and how the dossiers resulting from this assessment should be presented.

scientific & technical offer

- **Environmental monitoring and ecological water status assessment**

Any productive activity that can generate a harmful discharge into the environment must be regulated and monitored regularly. Ecological risk assessment studies can determine whether these activities comply with current regulations and quantify the impact on aquatic ecosystems caused.

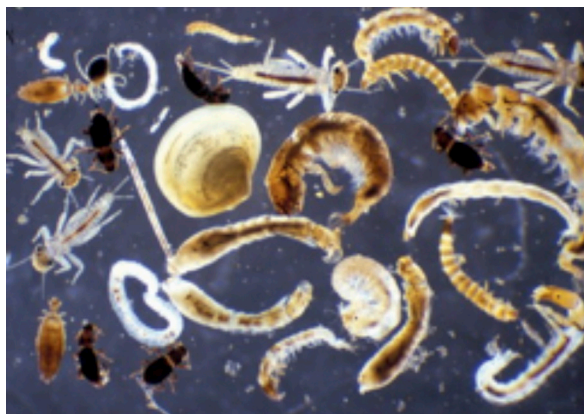
- **Calculating ecological risk and development of predictive models**

Changes in the production model and the use of chemicals call for predictive models able to resolve the issues arising from new environmental pollution scenarios. Mathematical models for contaminant transport, calculating the exposure and effects of the same on individuals, populations and ecosystems enable us to resolve these issues and identify effective measures to minimise the environmental risk caused by pollutants.

IMDEA WATER SOLUTIONS

At IMDEA Water we are specialists in scientific consultancy and the environmental risk assessment of pollutants. We have a multidisciplinary team responsible for:

- Measuring of pollutants in water soil and sediment samples.
- Toxicity assays with aquatic organisms at individual, population and community level (using microcosms).
- Environmental monitoring of invertebrates and other aquatic organisms, and assessment of the ecological status of waters.
- Calculating environmental risk of pollutants by means of predictive exposure and ecological models.
- Guidance in the design of ecotoxicology experiments and dossier planning for contaminant recording and assessment.



IMPLEMENTATION SECTOR

- Chemical industry (pharmaceutical sector, agrochemicals and manufacturing of domestic and personal hygiene products)
- Wastewater treatment plants
- Power plants and other industries generating environmental discharges
- Ministry of environment and watershed management (Water Boards)
- Farming cooperatives responsible for handling phytosanitary products
- Environmental organisations (NGOs, foundations)

ADDITIONAL INFORMATION

The IMDEA-Agua aquatic ecotoxicology group participates in several international projects. One of the group's main projects focuses on assessing the environmental impact of pollutants used in aquaculture in the European scope. Another project evaluates the different stress factors in Mediterranean aquatic ecosystems.

TECNOLOGY KEYWORDS

Aquatic ecology, ecotoxicology, ecological risk assessment, environmental pollution

CONTACT PERSON

Andreu Rico

andreu.rico@imdea.org

Marco Vighi

marco.vighi@imdea.org