

Functional ecology in aquatic systems

Synopsis

All organisms are not equal when exposed to environmental contamination. Inter- and intra-specific variation in responses to pollutants triggers a cascade of effects, affecting biodiversity and its resilience. These effects will be presented from physiological functions up to populations demography and genetics, through life-history traits and behavior.

Aims

To provide awareness and understanding of organisms' response to environmental contamination from individual to meta-populations.

Objectives

At the end of the Unit, you should:

- 1) Understand the dynamics of pollutants in the living compartment of ecosystems.
- 2) Grasp the physiological mode of action of the main types of pollutants and their effect on traits at the level of the whole organism.
- 3) Project the consequences at the population level, while accounting for evolutionary forces (selection, heredity).

Key Skills Acquired

At the end of this Unit, you should be able to:

- 1) Mobilize classical concepts in ecology to interpret the effect of pollutants on populations.
- 2) Make use of state-of-the-art modelling tools to predict the effects of pollutants on population dynamics and evolution.

Syllabus

Topics covered include:

- Metabolism and energetic status
- Life-history strategies
- Population dynamics (including metapopulations) and demogenetics

Learning & Teaching

- Lectures: 15h
- Seminars: 5h
- Laboratory work: 15h

Teaching Staff

C. Recapet (Coord.), M. Vignon, J. Labonne, F. D'Amico

Semester: 1

Timetable slot: To be advised

ECTS:6

Level: Mandatory

Bibliography

- M.C. Newman. 2014. Fundamentals of Ecotoxicology: The Science of Pollution. CRC Press.
- M.C. Molles, A.A. Sher. 2018. Ecology: Concepts and Applications. McGraw-Hill Higher Education.
- T. Jager. 2019. Making Sense of Chemical Stress. Application of Dynamic Energy Budget Theory in Ecotoxicology and Stress Ecology. Version 2.0. Leanpub. https://leanpub.com/debtox_book.

Assessment

- Written theory examination (40%)
- Laboratory reports and oral presentations (60%)

Course Evaluation

By completion of University Evaluation Questionnaire by students, annual assessment by Unit Coordinator.