

Supervision :

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First name: Olivier
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Funding for student:IRSTREA
 yes to be discussed no

Title of the research project :

**Combined effects of anthropogenic stressors and parasitism in
Gammarus pulex : impacts on physiological, behavioural and life-history traits**

Key words :

Acanthocephalans ; Neurotoxicants ; Endocrin disrupter ; Locomotory activity ;
Feeding rate ; Immunity ; Reproduction ; Metabolism

Brief description :

The exposition of organisms to multiple stressors is common in their natural environment, albeit barely never addressed in ecotoxicological studies nor, from a more fundamental point of view, in the study of adaptation and the resulting life-history trade-off. The freshwater amphipods are considered as sentinel organisms, owing to their sensitivity to toxicants, and their critical role in aquatic ecosystem functioning. In ecotoxicological studies, they have been used to develop biotests and biomarkers (1). In addition, the consequence of infection with macroparasites on the gammarids' physiology and behavior is well known. However, the combined effects of these stressors are still poorly documented (2).

A multidisciplinary approach, combining behavioral assays, and individual and infra-individual biomarkers of stress, survival and reproduction, is necessary to understand the independent, synergistic or antagonistic effects of multiple stressors. It will be implemented in the present research project, to address the combined effects of infection with an acanthocephalan, pollutants and temperature, on the behavior and physiology of *Gammarus pulex*. More specifically, we will test whether adaptation to parasitism interferes with the capacity of *G. pulex* to resist to these abiotic stressors. We will monitor locomotory activity, feeding rate, pairing success, metabolic rate, oxidative stress and immunity, as well as investment in reproduction.

The traineeship will be based in Lyon (Irstea), excepted the last week(s) in the Ecology-Evolution team in Dijon (to perform biochemical assays).

Literature (2 references):

- (1) Kunz PY, Kienle C, Gerhardt A. 2010. Reviews of Environmental Contamination and Toxicology, 205 : 1-76.
- (2) Marcogliese DJ, Pietrock M. 2011. Trends in Parasitology, 27: 123-130.

Technical aspects of the research project:

Behavioural assays, mortality monitoring, respirometry, biochemical assays

Essential skills and abilities desired:

Perseverance, observation and organisational skills