Institute: Institute of Environmental Sciences

Topic: Are organisms redundant at all? - a phenotypic plasticity perspective at the clonal level

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Background information:
The project is anchored in a classical discussion concerning biodiversity, started in 1980ties and not solved till now: are the organisms redundant? Namely, to what extent would the change in community composition affect its functioning? This seemingly simple question is not trivial, because the huge variety of life strategies of living organisms makes it, firstly, very difficult to properly choose a representative test system, and secondly, it is equally difficult to interpret the results obtained for organisms that differ in some respect (e.g., body size), but it is not clear what ecological consequences this may have.

The main question to be addressed in the project:
The goal of the project is to determine the level of environmental disturbance at which cultures consisting of mixtures of clones with potentially different uses of available resources will begin to show differences evident in functioning at the community level, with that functioning being defined as the chemical composition of the medium.

Information on the methods/description of work:
The study will be conducted on five clones which represent the rotifer species Lecane inermis. All clones were previously examined concerning their thermal preferences and plastic body size response to temperature changes (Temperature-Size Rule). Therefore, the information on interclonal differences in performance at various temperatures is known. The studies will base on the mixtures of clones, and in any case the trait investigated will be the chemical parameters of the culture medium, acting as information on functioning of a given culture. The whole experiment will consist of consecutive stages with increasing level of complexity, to enable demarcating the type of disturbance at which possibly different use of available resources among clones will affect the function of the experimental culture. At the basic stage, all combinations of pairs representing five clones will be exposed to low, optimal and high temperature (all selected based on the previous studies). The two-clone mixtures will be followed by the three-clone mixtures. In the next stage, the presence of a competing species (a bacterivorous protist) will be added to three clone mixtures. In a final stage, the three-clone mixtures will be exposed to environmental disturbance caused by fluctuating temperature or by lower pH. In all cases, the cultures will be maintained at three temperatures as described for the first stage.

Additional information (e.g Special requirements from the student)**:**
The basic requirements from the candidate are: knowledge in evolutionary ecology theory and biodiversity, good manual skills for the work with live rotifers, advanced knowledge in statistics and good communication skills.

Place/name of potential foreign collaborator:
there is no collaboration included in the project, but the student will be encouraged and assisted by the supervisor to find and realize an internship on her/his own.

References (3**):**
[1] Walker, B. H., 1992; https://www.jstor.org/stable/2385847
[2] Naeem, S., 2008; https://conbio.onlinelibrary.wiley.com/doi/abs/10.1111/j.1523-1739.1998.96379.x
[3] De Meester et al., 2016; https://link.springer.com/article/10.1007/s00442-016-3677-3