

Effects of environmental stress on water organisms

May 7 2014

Biodiversity on Earth is in rapid decline, and flowing waters are particularly affected. A team of biologists at the Ruhr-Universität Bochum (RUB), headed by Dr Florian Leese, analyses which environmental influences affect water organisms the most. They are the first ones to look into the combinations of different stress factors. Based on the results, the researchers put forward suggestions for the protection of biodiversity. According to project leader Florian Leese, it is high time to do something for the preservation of biodiversity.

Stress factors: nutrients, sediment supply and reduced flow velocity

From the Breitenbach stream in Hesse, the researchers siphoned off water with the organisms that live in it into containers. They subjected those containers to a certain stress factor or a combination of several stress factors. The team measured the impact of increased nutrient supply, sediment delivery and reduced flow velocity. All three stress factors had a negative impact on most of the [species](#). In combination, the harmful effect became particularly pronounced: "The more stressors we added to the experiment, the stronger the organisms' stress reaction," concludes Florian Leese. "Sometimes, stressor one and stressor two put together will not merely be twice as bad, but rather three, four or eight times as bad."

Genetic level provides additional information

The "GeneStream" team is currently setting up a series of tests at the Felderbach stream in the Elfringhauser Schweiz region. In this experiment, the researchers additionally analyse the organisms' genetic makeup. In the rapidly changing environment, only those species can survive in the long term that are particularly adaptable; and adaptable are those species that have a high genetic diversity. "It's the same as with the polar bear," compares Florian Leese. "Just because there are currently still many individuals of a species left, it does not mean that the species will be able to survive in the long term."

Less than five per cent near natural flowing waters in NRW

"In NRW, less than five per cent of all flowing waters are more or less near natural; more than 60 per cent have been completely reshaped by humans," says Leese. Under the Water Framework Directive, the EU member states have committed themselves to achieve good chemical and ecological status of all surface waters by 2027. "We are lagging far behind this ambitious schedule. Dovetailing basic research and water management is crucial," continues the Bochum scientist.

Provided by Ruhr-Universitaet-Bochum

Citation: Effects of environmental stress on water organisms (2014, May 7) retrieved 6 July 2024 from <https://phys.org/news/2014-05-effects-environmental-stress.html>

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