Genetically engineered organisms are a threat to nature conservation

New warning on the spread of GE organisms in natural populations

13 November 2019 / A new report presented in Berlin today looks at the risks of introducing genetically engineered organisms into natural populations, including potential consequences for nature conservation. Relevant examples are genetically engineered flies, bees, trees and corals, as well as the use of genome editing to reconstruct mammoths.

The report was compiled by Testbiotech for the German League for Nature, Animal and Environment Protection (Deutscher Naturschutzring, DNR) and focusses on the impact of genetic engineering on evolutionary processes and mechanisms. Leading experts in the field of 'genome editing', including those such as Jennifer Doudna and George Church, have announced "the end of the beginning". In future, new life forms will no longer result from natural processes of self-reproduction and self-reorganisation; they can be designed in the laboratory. In this context, new technical tools such as the 'gene scissor' CRISPR/Cas are set to play a decisive role.

The report warns about the consequences of applying the new technology, its potential to engineer very short strands of DNA could possibly lead to major biological effects. The introduction of specific gene patterns creates new combinations of genetic information conceivably connected to substantial risks for nature and the environment. This is especially relevant if such organisms are allowed to spread and propagate in natural populations.

One recent example showing the risks is the so-called 'Monarch Fly'. A gene in fruit flies (Drosophila melanogaster) was adjusted to a similar gene of the monarch butterfly. Just three tiny changes in individual base pairs within a gene can make the fruit flies resistant to toxins produced by specific plants. Consequently, the flies ingest the toxin and thereby become toxic to other animals feeding on them. Releasing the flies into the environment may therefore have detrimental effects on the food web and interconnected ecosystems.

The report warns about the introduction of "great masses of disharmonious gene patterns" into the natural populations. Whereas the 'Monarch Fly' is only intended for contained experiments, there are already plans to release GE insects, trees, rodents, corals and microbes into the environment. There are even some proposals suggesting the use of such organisms in nature conservation.

In the light of these findings, the report recommends two simple rules for dealing with the 'old' and 'new' methods of genetic engineering:

- No releases should be allowed without having effective measures in place for spatio-temporal control to retrieve the GE organisms if needed.
- Regulation and mandatory risk assessment should encompass all organisms resulting from methods of genetic engineering, regardless of whether additional genes are inserted or not.

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Further information: Link to report (only in German) [2]
Link to the Testbiotech assessment of a IUCN report on the same topic [3]

Source
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