

# Worms under stress

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Species respond far more dynamically to disturbances in their environment than we think. This is the conclusion of Dutch researcher Olga Alda Alvarez following her research into the stress response of nematodes, tiny worms that occur in large numbers in the soil. The outcomes of this study are important for further research into the consequences of climate change and pollution on the stability of the ecosystem.

Alda Alvarez investigated how two species of nematodes responded to pollution of their environment with toxic substances and changes in the ambient temperature. As bacteria eaters, nematodes play an important role in the decomposition process in the soil. They are also easy to study in the laboratory.

The researcher discovered that how nematodes respond to pollution is related to their life cycle. Sexually-reproducing strains are more pollution sensitive than hermaphroditic strains. This in turn has a negative effect on the population growth rate. Alda Alvarez also observed that following the pollution, the toxicity of the nematodes does not increase but is variable.

## Gene regulation

Additionally from a genetic viewpoint, nematodes quickly adapt to environmental factors such as the ambient temperature. For example a temperature rise from 16 to 24 degrees Celsius, results in a significant change in the composition of the genome and the interaction between the

genes. The gene regulation network is therefore strongly dependent on the ambient temperature.

The outcomes of Alda Alvarez' research are extremely important for further research into the effects of so-called abiotic factors, like pollution and climate change, on ecosystems. This is because these factors have a far less constant effect than has been assumed up to now.

Moreover, Alda Alvarez not only studied the stress response of species at a population level but also at the level of gene expression. Her research method has therefore provided further insights into the mechanisms underlying stress responses. Alda Alvarez believes that future research into the consequences of pollution by toxic substances should take into account the type of toxic substance, the life cycle of the species studied and the species characteristics for which the toxic effect is measured.

Source: NWO

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