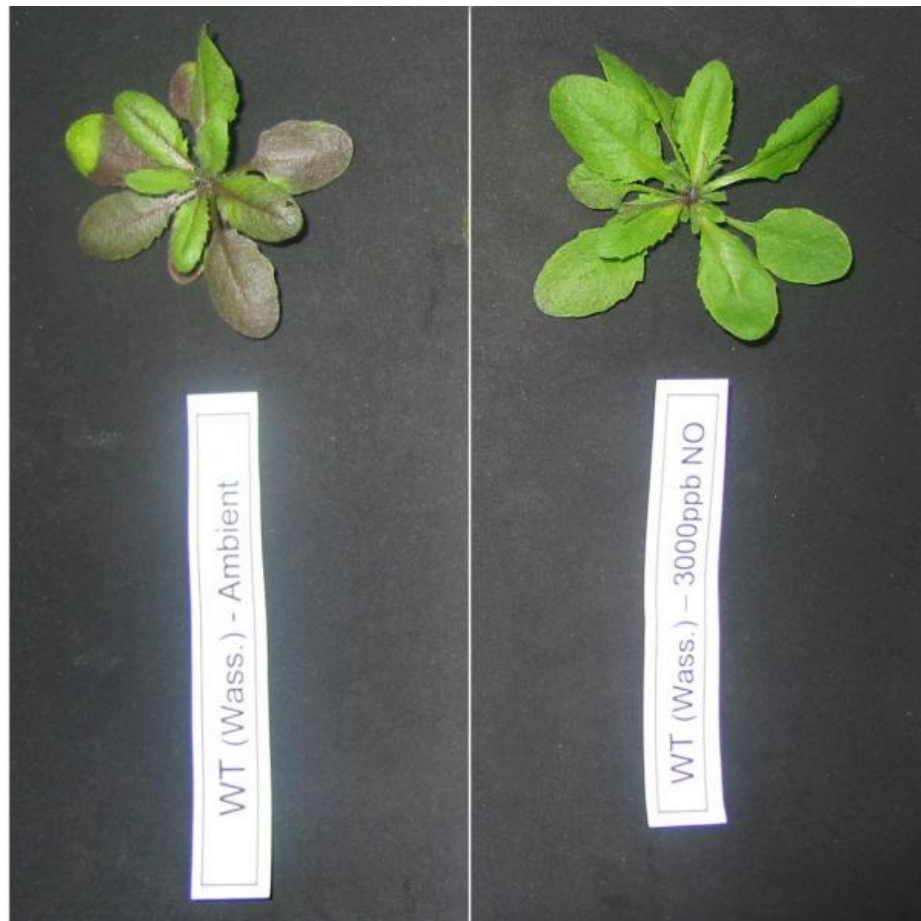


# Plant hemoglobin proteins help arabidopsis thaliana plants fix atmospheric nitric oxide

June 13 2016



Increasing concentration of NO leads to a better growth of plants. The plant left was exposed to 0 ppm NO, the plant right to 3.0 ppm NO. Credit: HMGU

In Germany, the emission of nitrogen oxides (NO<sub>x</sub>) amounts to approximately 1.3 million tons per year. These emissions are mainly caused by combustion processes in industrial facilities and engines. In humans, the gaseous pollutants particularly irritate the mucous membranes in the respiratory organs and eyes. Until now it was assumed that plants cannot absorb atmospheric NO.

Now, researchers of the Institute of Biochemical Plant Pathology (BIOP), in collaboration with staff of the former Institute of Soil Ecology (IBÖ), the Research Unit Experimental Environmental Simulation (EUS) and the Research Unit Analytical BioGeoChemistry (BGC) at Helmholtz Zentrum München have discovered the underlying mechanism that *Arabidopsis thaliana* plants use to draw NO directly from the air, which they subsequently fix into their nitrogen metabolism. "We observed that fumigation with high levels of nitric oxide was not toxic, but rather actually improved plant growth," said Dr. Christian Lindermayr of the Institute of Biochemical Plant Pathology at Helmholtz Zentrum München.

"The mechanism is believed to have originated in order to ensure the survival of plants located at sites with [nitrogen](#) deficiency," said Dr. Gitto Kuruthukulangarakoola, first author of the study who is also a researcher at BIOP. With regard to the air quality in cities with high concentrations of [nitrogen oxides](#), this property of *Arabidopsis thaliana* plants could contribute significantly to the reduction of NO and thus improve [air quality](#). This finding may be especially significant for future urban planning in metropolitan areas and may contribute to improved living conditions there.

**More information:** Gitto Thomas Kuruthukulangarakoola et al. Nitric oxide-fixation by non-symbiotic hemoglobin proteins in under N-limited conditions, *Plant, Cell & Environment* (2016). [DOI: 10.1111/pce.12773](https://doi.org/10.1111/pce.12773)

Provided by Helmholtz Association of German Research Centres

Citation: Plant hemoglobin proteins help arabidopsis thaliana plants fix atmospheric nitric oxide (2016, June 13) retrieved 13 March 2024 from <https://phys.org/news/2016-06-hemoglobin-proteins-arabidopsis-thaliana-atmospheric.html>

|  |
|--|
| <p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p> |
|--|