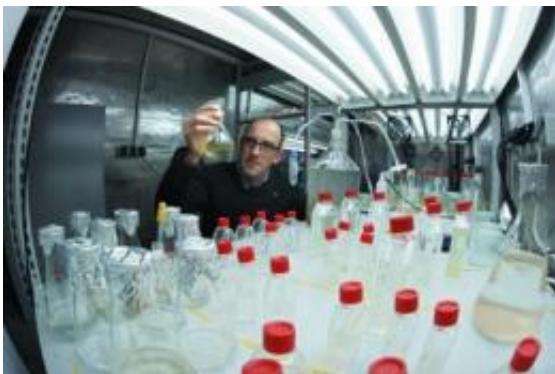


Chemists reveal how algae delete unwanted 'competitors'

January 30 2012



The chemist Professor Dr. Georg Pohnert of Jena University checks cultures of algae kept in a special container. Credit: Photo: Jan-Peter Kasper/Univ. Jena

Every morning when the sun comes up, the ocean ground is radically cleaned. As soon as the first rays of sunlight find their way into the water, the microalgae "Nitzschia cf pellucida" start their deadly 'morning hygiene'. The algae, the size of only some few micrometers, wrap themselves and their surroundings in a highly toxic poison: cyanogen bromide, a chemical relative of hydrocyanic acid, although much more toxic.

Like a 'molecular toothbrush', which removes other [micro-organisms](#) thoroughly, every morning this chemical mace 'disinfects' the ground on which these diatoms grow. "Thus they can ideally grow and keep direct competitors for light and free space in check," Professor Dr. Georg

Pohnert of the Friedrich Schiller University Jena (Germany) states. The director of the Institute of Inorganic and [Analytical Chemistry](#) revealed together with his team and colleagues of the University Ghent (Belgium) the chemical devastating blow of the diatoms. Their findings were published in the new edition of the well known science magazine [Proceedings of the National Academy of Sciences](#).

Cyanogen bromide is a highly poisonous metabolic toxin and is – amongst other things – being used for the lixiviating of gold ores. During the First World War it was also used as a chemical weapon. "Until now it wasn't even known that this poison occurs in the living nature at all," says Professor Pohnert. For "Nitzschia cf pellucida" the production of cyanogen bromide seems to be easy though. As soon as the first rays of sunlight find their way into the water, the cellular 'devil's workshop' starts to work. "From two up to four hours after day break the concentration of the released cyanogen bromide is at its highest, later on it decreases," Professor Pohnert explains one of the results of his new study.

The scientists can still only speculate about the fact that the poison doesn't harm the diatoms themselves. One thing is for sure: While the 'competing' algae give up after two hours at most, subsequent to being attacked by cyanogen bromide the poison at the same time doesn't harm Nitzschia cf pellucida. To find the reasons for this is one of the next research objectives of the Jena scientists and their Belgian partners.

But according to chemist Pohnert this would be pure basic research. Cyanogen bromide is completely inapplicable to practical use – for instance as a means against unwanted algae growth. Because it is certain that in this case it is not only the [algae](#) that would be damaged.

More information: Vanelslander B et al.: Daily bursts of biogenic cyanogen bromide (BrCN) control biofilm formation around a marine

benthic diatom. *PNAS* 2012, [doi:10.1073/pnas.1108062109](https://doi.org/10.1073/pnas.1108062109)

Provided by Friedrich-Schiller-Universitaet Jena

Citation: Chemists reveal how algae delete unwanted 'competitors' (2012, January 30) retrieved 2 May 2024 from <https://phys.org/news/2012-01-chemists-reveal-algae-delete-unwanted.html>

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