

# Genetic markers for tracking species

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At the supermarket checkout, hardly anybody enters prices manually anymore. Using scanners that can read the barcodes is much faster. Biologists now want to use a similar procedure for identifying domestic animal and plant species more efficiently. German Barcode of Life is the name of an initiative on which zoologists and botanists are collaborating in Germany. Botanists from the University of Bonn have taken the lead for the flora.

"In the DNA of living beings, we have identified sections as 'DNA barcodes' that, while being almost identical within a certain [species](#), differ among the various species," explained Prof. Dr. Dietmar Quandt from the Nees Institute for Biodiversity of Plants at the University of Bonn. "Based on these markers, we can then identify species unambiguously and relatively fast." The result of this analysis resembles a barcode at the supermarket; only that it does not come in black and white, but in four colors, with each one corresponding to one of the four letters of the [genetic code](#).

## What counts is only (the genetic) make-up

In classical biological taxonomy, animals and plants are identified by their external characteristics. "It is in species of a genus that resemble each other very closely, such as sedges, that definite identification can be a very long process," reported Prof. Quandt, Speaker for the botanical project within the GBOL Initiative. "In addition, we have to rely on competent experts here, who unfortunately are a dying breed nationally." Fully automated sequencing of DNA, however, allows identifying plants

much faster. "Besides, we do not need flowering and complete plants," added Stefanie Winter, one of Prof. Quandt's doctoral candidates. "A tiny fragment, e.g., from a leaf, is sufficient for identifying the species based on its [genetic markers](#)."

## **More than 5,000 plant species to be collected**

In the GBOL Project, the scientists first want to create a library of sample material for classifying the species. In a concerted initiative with the natural history museums, nature conservancy organizations and proven experts, specific plant samples will be catalogued throughout Germany. "For this purpose, the natural history collections have proven to be invaluable treasure troves since they are providing us with some of their priceless samples," said Prof. Quandt. The challenge is enormous: There are about 4,000 flowering plants in Germany, as well as 1,300 species of mosses and ferns.

## **Project to Improve Monitoring of the Environment**

Capturing our flora by means of DNA [barcodes](#) is intended to make monitoring environmental effects easier: How do individual species respond to climate change? Are certain species being replaced by living organisms that have been imported from other countries? Which species are threatened with extinction? "Given the many threats for life on Earth, environmental monitoring is becoming more important," said Prof. Quandt. "The DNA barcodes can simplify and accelerate such studies considerably."

**More information:** Information on the GBOL Project online at: [www.bolgermany.de/](http://www.bolgermany.de/)

Provided by University of Bonn

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