

“Digital identity card”: The IPK issues 200,000 identifiers für the identification of the complete gene bank material



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Gene banks play a prominent role in the conservation of global biodiversity. The plant materials, for example seeds of cereals, which are stored and preserved in gene banks, such in those at the IPK in Gatersleben, are called accession. These resources are mainly given to researchers or breeders around the globe. In addition, the material is shared between gene banks all over the world. But this is not always easy. "The identification of gene bank samples have been managed in very different ways. This posed a major challenge in the cooperation of gene banks," explains Dr. Stephan Weise, head of the Genebank documentation research group (DOK) at IPK. An effective access to and the exchange of information on plant genetic resources requires their unique and enduring identification. This simplifies the interlinking of all associated information.

The IPK gene bank has now taken a big step forward in this problem. So-called Digital Object Identifiers (DOI) have been assigned for 200,000 accessions - the 150,000 accessions of the gene bank as well as further samples from precision and research collections and a number of historical accessions. "This is a further step towards increasing the visibility and usability of the plant genetic resources of the gene bank and further developing the IPK into a bio-digital resource centre," emphasises Dr. Daniel Arend, main developer of the DOI allocation programmes in the bioinformatics and information technology group (BIT).

The project is based on a corresponding recommendation of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). "As the largest gene bank in the EU27, we now follow the recommendations and rely on DOIs for clear identification," says Weise. DOIs are an internationally standardised procedure for uniquely identifying digital objects such as books and journal articles, but also data.

This is also advantageous for gene banks in order to ensure the use of submitted material, the traceability of origin, the linking of scientific data collected on individual accessions or the unambiguous assignment in the case of modified descriptions. "The assignment of DOIs has made it possible to minimize the proliferation of names and transfer errors during the transfer and worldwide use of material from our gene bank," says Prof. Dr. Andreas Graner, managing director of the IPK and head of the Genebank department. "DOIs bring clarity to the worldwide nomenclature chaos and will in future facilitate the tracing of origin of genetic resources."

Through a contract with the DataCite Consortium for the use of the DOI allocation service of the German National Library of Science and Technology (TIB) of the Leibniz Information Centre in Hannover, the IPK is able to allocate DOIs itself. This was taken over by the two research groups DOK and BIT. In future, the assignment of a DOI will also be part of the

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new admission of accessions to the IPK gene bank. In this way, the unambiguous identifiability can be secured over generations and it will also be possible to trace the use of the accessions.

The metadata necessary for the registration of DOIs are searchable at DataCite. For all DOIs, web pages, so-called landing pages, were created with the most important data. Starting from these landing pages, users can access the extensive information of the Genebank Information System. It is also possible to register the DOIs in the Global Information System (GLIS) of the Treaty. The registered samples of the IPK gene bank will also play a pioneering role in the AGENT project coordinated by the IPK and funded by the European Commission with a total of seven million euros. A total of 19 partners from 16 countries are involved in AGENT.

The Plant Genomics and Phenomic Research Data Repository, among other things, has been in existence since 2015 for the publication of research data, including those produced by means of accessions to the gene bank. In the future, the IPK as a full member of the DataCite network will be even more active in the field of data sharing.

The IPK gene bank

The IPK gene bank has been developing continuously for more than 75 years and thus has a unique expertise in the management of plant genetic resources. The collection comprises more than 3,000 species from almost 800 genera, and with more than 150,000 active patterns it represents the largest collection of its kind in Western Europe.

Original publication:

Genebank Information System (GBIS): <https://gbis.ipk-gatersleben.de>

Plant Genomics and Phenomic Research Data Repository (e!DAL-PGP):
<http://edal-pgp.ipk-gatersleben.de>

M. Oppermann et al (2015) GBIS: the information system of the German Genebank. Database (Oxford), 2015:bav021. DOI: 10.1093/database/bav021

D. Arend et al (2016) PGP repository: a plant phenomics and genomics data publication infrastructure. Database (Oxford), 2016:baw033. DOI: 10.1093/database/baw033

Figures (for free use):

<https://ipk-cloud.ipk-gatersleben.de/f/3873656>



More than 150,000 active patterns are stored in the IPK gene bank in Gatersleben. Photo: Schafmeister/ IPK

Samples are regularly brought as duplicates to the "Global Seed Vault" at Svaldbard. Photo: IPK



The IPK gene bank in Gatersleben is housed in the Vavilov building. Photo: Bergstein/ IPK

The samples are stored at minus 18 degrees to maintain the germination capacity as long as possible. Photo: Devrient/ IPK