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BMT/11/20
ORIGINAL: English
DATE: August 25, 2008

UPOV

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

GENEVA

WORKING GROUP ON BIOCHEMICAL AND MOLECULAR TECHNIQUES AND DNA PROFILING IN PARTICULAR

Eleventh Session
Madrid, September 16 to 18, 2008

A PRACTICAL EXAMPLE OF THE POSSIBLE USE OF MOLECULAR TECHNIQUES IN VARIETY IDENTIFICATION

Document prepared by experts from the
Community Plant Variety Office of the European Community (CPVO)

SUMMARY

1. This document contains a proposal on how a system of variety identification based on molecular techniques could be put into practice. Roses are taken as an example species. The paper addresses technical, legal and procedural issues in this respect.

BACKGROUND

2. Breeders have frequently expressed the difficulties they encounter when exercising their rights in cases of infringement. One of the major problems is the identification of suspicious material. The verification of the identity of suspicious plant material with the help of molecular techniques has important advantages compared to the growing of plant material of the protected variety alongside the allegedly infringing material and/or the comparison of variety descriptions.

3. At the Tenth Session of the Working Group on Biochemical and Molecular Techniques and DNA Profiling in Particular (BMT), held in Seoul from November 21 to 23, 2006, the Community Plant Variety Office of the European Community (CPVO) presented a paper evoking more generally the use of molecular techniques in variety identification (see document BMT 10/10 “The use of molecular techniques in variety identification”). In order to illustrate the possible application of this approach, a practical example on the possible use of molecular techniques in variety identification is provided.

The CPVO R&D project “A European reference collection of rose varieties”: an example

4. In this project an integrated pilot database was constructed containing, in addition to administrative and morphological data, a picture of each variety and a profile with 12 selected microsatellite markers for approximately 380 rose varieties covering several cultivation types. The project delivered a database, physical DNA samples and a DNA fingerprint for each candidate variety.

DNA sample and its use

5. As a result of the project, it became obvious that a DNA sample obtained from the plant material used for the DUS test and the subsequent DNA fingerprint could offer breeders a valuable tool for the enforcement of their rights.

6. The “value” of using a DNA sample of a variety, obtained during the DUS test, would be that it has been extracted by an accredited laboratory according to an agreed procedure on the original sample also used for DUS testing and monitored by a plant variety protection authority.

7. However, considering that methods used for the production of DNA fingerprints evolve rapidly, a question arises on the usefulness for a DNA fingerprint which has been obtained using a technical protocol of the past.

8. In order to avoid the systematic production of DNA fingerprints which might become obsolete in a short time, it might be sufficient to only take a DNA sample, obtained from plant material used in the DUS test, which could be kept and used for the production of a DNA fingerprint when considered necessary with the method applied and adopted at that time.

9. The CPVO will send a questionnaire to the breeders' organization asking them which of the following two options would be their preference:

Option A: To only keep, in addition to the variety description, a DNA sample from the original material of their variety; or

Option B: To keep a DNA sample and a DNA fingerprint of the variety.

10. On the basis of the opinion expressed by the breeders, the possibility for keeping a DNA sample could be either generally implemented, (if there is a high level of interest) or, in case of a low level of interest, a DNA-sample would be offered only to those applicants requesting that provision.

11. Both options require the accreditation of a laboratory which would be audited by the CPVO.

12. The following paragraphs address the practical implementation of the results of the R&D project on roses with regard to the needs for variety identification, considering the above mentioned options. This could serve as a model for other species.

13. The following paragraphs describe a scenario which is currently under discussion, taking into account the ongoing exchange of views between the breeders' organization and the CPVO.

Technical requirements

Option A

a) The plant sample for the DNA profiling should be taken by the DUS examiner from the plant material which is used for the DUS test, according to an agreed protocol.
b) The plant sample would be sealed and transported to an accredited laboratory.
c) The DNA sample would be extracted from the plant sample, kept and maintained at the laboratory according to an adopted protocol.

Option B

a) As above, plus the sample as elaborated for Option A would be used.
b) A selection of sequence-tagged-site microsatellite (STMS) markers according to their level of polymorphism, robustness, ease of scoring and their distribution over the genome has been set up by the project partners; the technical protocol for the marker analysis has been elaborated.
c) A DNA fingerprint would be produced according to the procedure and protocol above.
d) The DNA sample would be kept and maintained at the laboratory.

Administrative and financial considerations

Option A

a) If a DNA sample was kept as a general procedure for all protected varieties, the costs could be covered by the fees. If this was not the case, the applicant in question would bear the costs.

Option B

a) As above plus the applicant would bear the costs for each DNA fingerprint, (on the assumption that DNA fingerprinting would not be performed as a procedure for all protected varieties).
b) The laboratory would send the DNA fingerprint to the CPVO and to the applicant who would be invoiced directly by the laboratory.

Legal considerations

Option A

a) To clarify the ownership of the DNA sample.
b) To clarify the responsibility of the DNA sample keeping (laboratory, authority or breeder?).
c) To clarify who would decide on the granting of access in the case of a request for access to a DNA sample by others than the breeder, e.g. request by third parties or by court.

Option B

a) As above plus to clarify if the DNA fingerprint could be kept confidential, (if requested by the breeder).
b) To clarify whether the DNA fingerprint to be a part of the official variety description.

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