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

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CONSTRUCTION OF A MOLECULAR DATABASE FOR SOYBEAN VARIETY IDENTIFICATION IN BRAZIL

Document prepared by experts from Brazil

The narrow genetic base of soybean makes variety characterization based on morphological descriptors difficult. This characterization is mainly done for registration and plant variety protection. Correct characterization of varieties could be achieved through molecular markers, since the frequencies of each allele in the population are known. Consequently, we developed a molecular characterization method and initiated the construction of a molecular database for soybean variety identification. We began a genetic database of SSR markers in Brazilian soybean variety (Oliveira et al., 2010). Thirty-two soybean varieties were analyzed with 48 fluorescent-labeled microsatellite markers. The reactions were carried out in singleplex, and genotyping in quadriplex, using a capillary electrophoresis system in an automated sequencer. Probabilities of random identity and probabilities of random identity exclusion were calculated through estimated allele frequencies. A characterization profile was considered when the probability of random identity exclusion was equal or superior to 99.9999%. All steps of the experiment were doubled, using two independent sets of the same variety to evaluate the reproducibility of the method. A set of 13 microsatellite markers identified all 32 varieties with 99.9999% certainty. The method was efficient and precise, with high reproducibility for variety characterization. These data are the beginning of a molecular database for soybean, and they can be used for variety characterization for registration and plant variety protection purposes and for variety identification in cases of intellectual property enforcement.

Marcelo Berwanger de Oliveira[2], Elisa Serra Negra Vieira[2,3], Ivan Schuster[1,3]
[1]Unipar, Umuarama, PR.[2]Coodetec , Caixa Postal 301, Cascavel, PR. CEP 35830-450. ivan@coodetec.com.br.[3]Endereço atual Embrapa Floresta, Colombo, PR.

Reference

Oliveira, M.B., Vieira, E.S.N., Schuster, I. Construction of a molecular database for soybean cultivar identification in Brazil. Genetics and Molecular Research 9(2):705-720, 2010.

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