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“Bridging the gap between increasing knowledge and decreasing resources”

Characterisation of Accessions Held at the International *Musa* Genebank

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Abstract

The International Transit Centre (ITC) managed by the Bioversity International is the largest *ex situ* collection of *Musa* germplasm. The genebank is hosted by Katholieke Universiteit Leuven in Belgium and maintains *in vitro* more than 1500 accessions, which include cultivated clones of banana, improved materials and wild *Musa* species. Efficient conservation of plant germplasm and use in breeding programs depends on proper identification and in-depth characterisation at the phenotypic and genotypic level.

We have been involved in the cytogenetic and molecular characterisation of the ITC accessions. This included estimation of nuclear genome size and/or ploidy level using flow cytometry, chromosome number, characterisation of the karyotype and genomic constitution by fluorescence in situ hybridisation as well as genotyping with molecular markers. Here we report on the application of a standard *Musa* genotyping platform which enables discrimination between individual *Musa* species, subspecies and subgroups. This platform is based on 19 microsatellite markers which are scored using fluorescently labelled primers and high-throughput capillary electrophoresis separation with high resolution. In order to characterise selected ITC accessions in more detail, we analysed their ITS sequences and studied phylogenetic relationships within the Musaceae family. To date, we have genotyped more than 280 diploid and more than 300 triploid accessions including edible bananas and their putative parents, as well as wild *Musa* accessions, which have been described for the first time. This work provided new and important information on the accessions held at ITC and identified mislabeled and putative duplicated accessions.

Keywords: Genetic diversity, *Musa*, *Musa* genebank, SSR genotyping platform