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IRRADIATION AS MEANS FOR INCREASING GENETIC DIVERSITY IN BANANA: THE NEED TO CARRY OUT RADIOSENSITIVITY TESTS ON IN-VITRO CULTURES AT APPROPRIATE STAGE OF GROWTH

Banana in Mauritius is affected by several biotic and abiotic stresses and genetic improvement through conventional breeding is limited by the low-female fertility, fruit parthenocarpy and time-consuming methods. Worldwide, mutation induction through use of radiation and chemicals has been widely used to induce variation at a higher frequency in banana. Banana mutation breeding in Mauritius was initiated in 2007 through support of an IAEA through a technical research project, using irradiation of banana shoot-tips ('Gingeli' banana) with gamma rays. At that time, with exception of Cavendish types, the genomic group and ploidy level of most varieties were poorly documented as they were known by local names only. Historical records referred the 'Gingeli' banana to Figue Sucrée or Sucrier (AA). The first radiosensitivity test, with doses from 0 to 100 Grays, was carried out in a batch of shoot-tips derived from cultures that were sub-cultured over ten times. The same was repeated in another batch that was sub-cultured around 8 to 10 times. A GR30 of less than 9 and 15 Grays were obtained respectively. As this was within reported recommended range for diploids following gamma irradiation, it was thus assumed that the 'Gingeli' banana was probably a diploid. However, subsequent flow cytometric analysis of accessions in Mauritius revealed that most local bananas were triploid. Molecular studies also revealed that 'Gingeli' belonged to the Silk (AAB) group. A GR30 of 18-25 was then obtained on fresh in vitro cultures of 'Gingeli'. The range of 15 to 18 Grays was also obtained with triploids, Petite Naine (AAA), 'Ollier' banana (AAA, Cavendish-type) and Mamoul (ABB, P. awak group) based on survival and proliferation rates.

Country or International Organization

Food and Agricultural Research and Extension Institute (Mauritius)

Author: Mrs DUSSORUTH, babita (FAREI)

Co-author: Dr JANKOWICZ-CIESLAK, Joanna (IAEA)

Presenters: Dr JANKOWICZ-CIESLAK, Joanna (IAEA); Mrs DUSSORUTH, babita (FAREI)

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