

# FAO/IAEA International Symposium on Plant Mutation Breeding and Biotechnology



Contribution ID: 228

Type: Poster

## EXPLORING INDUCTION OF DOUBLED HAPLOIDS IN CASSAVA THROUGH WIDE CROSSING WITH CASTOR BEAN

The increasing demand for cassava for food and non-food uses necessitates that its breeding be made faster to respond to these demands. The characteristic long breeding cycle and heterozygous nature of cassava pose major obstacles to the rapid genetic improvement of the crop through breeding. This study was aimed at inducing doubled haploids (DHs) in cassava using wide crosses with castor bean (*Ricinus communis*) pollen. A total of 3,349 cassava flowers from twelve elite cassava varieties were pollinated with castor bean pollen. Early embryo rescue and ovule culture were done. 803 fruits were harvested, out of which 800 were dissected to obtain 1,312 young ovules and from the remaining three fruits, seven unique embryos were excised, all of which were cultured in vitro. 82 (6.25%) of the cultured ovules formed callus of interest, originating from the embryo sac region and four of the rescued embryos (57.1%) regenerated into plantlets. A microscope was used to assess and screen the morphology of calli, flow cytometry was used to determine ploidy level and single nucleotide polymorphism (SNP) genotyping was used to determine the level of homozygosity in regenerated plantlets and calli. Ploidy analyses of 24 samples of the regenerated plants and calli revealed 95.8% diploids (23 samples) and 4.2% aneuploids (1 sample). SNP genotyping revealed increased level of homozygosity of up to 84.2%. The knowledge generated in this study is an important contribution towards on-going efforts in developing protocols for generation of DH cassava.

### Country or International Organization

Uganda

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**Track Classification:** Enhancing agricultural biodiversity through new mutation induction techniques