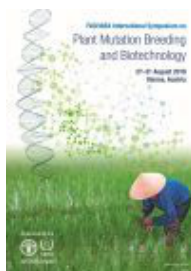


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INDUCED MUTAGENESIS IN PHASEOLUS VULGARIS L. USING GAMMA RAY AND DETECTION OF DNA POLYMORPHISM THROUGH RANDOM AMPLIFIED POLYMORPHIC DNA (RAPD) MOLECULAR MARKERS

Background

Phaseolus vulgaris L. is a valuable and highly nutritious food legume and highly underutilized in Nigeria as a result of prolong cooking time, low yield and anti-nutritional factors.

Methodology

7 doses (control, 25Gy, 50Gy, 100Gy, 150Gy, 200Gy, 250Gy) of gamma ray was induced using the gamma facility at the NIRPR, to evaluate its effect on morphological and yield-related traits of *P. vulgaris* varieties (Bokkos and Sardauna) and to identify polymorphism through Random Amplified Polymorphic DNA (RAPD) marker.

Results

Improved germination was observed in treated plants (25Gy to 250Gy) in both varieties. There was observed increase in the number of branches, pod length, pod width and number of seeds per pod in the Bokkos variety at 25 to 50Gy. While the Sardauna variety had some observed improvement (25 to 100Gy) in traits namely, plant height, number of branches, number of pods per plant, number of seeds per plant. Flowering and maturity in both varieties were earlier than the control at 200Gy and 250Gy doses. For molecular analysis, of the 12 primers screened, 8 were polymorphic with Primer OPB09 producing the maximum number of bands. Primer OPB01, OPB09, OPB07 and OPT01 showed unique (new) bands in 25Gy, 50Gy, 200Gy and 250Gy of both varieties. In the dendrogram constructed based on the genetic similarity coefficient, the mutants were grouped into four clusters. The treated plants showing their differences in morphological and yield-related traits also showed polymorphism in PCR profile amplified by RAPD marker.

Conclusion

Genetic variation was observed among the treated plants and their controls in both varieties. Further research on these mutants can lead to the development of elite line or parent donors for cross breeding to obtain hybrids with improved and better morpho-agronomic characteristics for crop improvement.

Country or International Organization

Nigeria

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Track Classification: Enhancing agricultural biodiversity through new mutation induction techniques