

## **Morpho-Agronomic Response to Water Stress of Some Nigerian Bambara Groundnut (*Vigna Subterranea* (L.) Verdc.) Germplasm and Genetic Diversity Studies of Some Selected Accessions Using Ssr Markers**

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**Abstract :** Water stress is a major factor limiting the productivity of crops in the world today. This study evaluated the morpho-agronomic response of twenty-four (24) Nigerian Bambara groundnut landraces to water stress and genetic diversity of some selected accessions using SSR markers. The studies was carried out in the Botanical garden of the Department of Plant Biology, Federal University of Technology, Minna, Niger State, Nigeria in a randomized complete block design using three replicates. Molecular analysis using SSR primers was carried out at the Centre for Bio- Science, International Institute of Tropical Agriculture (IITA) Ibadan, Nigeria in order to characterize ten selected accessions comprising of the seven most drought tolerant and the three most susceptible accessions detected from the morpho-agronomic studies. Results revealed that water stress decreased morpho-agronomic traits such as plant height, leaf area, number of leaves per plant and seed yield etc. A total of 22 alleles were detected by the SSR markers used with a mean number of 4 alleles. Simple Sequence Repeat (SSR) markers MBamCO33, Primer 65 and G358B2-D15 each detected 4 alleles while Primer 3FR and 4FR detected 5 alleles each. The study revealed significantly high polymorphisms in 10 Loci. The mean value of Polymorphic information content was 0.6997 implying the usefulness of the primers used in identifying genetic similarities and differences among the Bambara groundnut genotypes. The SSR analysis revealed a comparable pattern between genetic diversity and drought tolerance of the genotypes. The Unweighted Paired Group Method with Arithmetic Mean (UPGMA) dendrogram showed that at a genetic distance of 0.1, the accessions were grouped into three groups according to their level of tolerance to drought. The two most drought tolerant accessions were grouped together and the 5th and 6th most drought tolerant accession were also grouped together. This suggests that the genotypes grouped together may be genetically close, may possess similar genes or have a common origin. The degree of genetic variants obtained could be useful in bambara groundnut breeding for drought tolerance. The identified drought tolerant bambara groundnut landraces are important genetic resources for drought stress tolerance breeding programme of bambara groundnut. The genotypes are also useful for germplasm conservation and global implications.

**Keywords :** bambara groundnut, genetic diversity, germplasm, SSR markers, water stress

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