

Morphological and Molecular Characterization of Accessions of Black Fonio Millet (*Digitaria Iburua* Stapf) Grown in Selected Regions in Nigeria

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Abstract : *Digitaria iburua*, commonly known as black fonio, is a cereal crop native to Africa and extensively cultivated by smallholder farmers in Northern Benin, Togo, and Nigeria. This crop holds immense nutritional and socio-cultural value. Unfortunately, limited knowledge about its genetic diversity exists due to a lack of scientific attention. As a result, its potential for improvement in food and agriculture remains largely untapped. To address this gap, a study was conducted using 41 accessions of *D. iburua* stored in the genebank of the Laboratory of Genetics, Biotechnology, and Seed Science at Abomey-Calavi University, Benin. The study employed both morphological and simple sequence repeat (SSR) markers to evaluate the genetic variability of the accessions. Agro-morphological assessments were carried out during the 2020 cropping season, utilizing an alpha lattice design with three replications. The collected data encompassed qualitative and quantitative traits. Additionally, molecular variability was assessed using eleven SSR markers. The results revealed significant phenotypic variability among the evaluated accessions, leading to their classification into three main clusters. Furthermore, the eleven SSR markers identified a total of 50 alleles, averaging 4.55 alleles per locus. The primers exhibited an average polymorphic information content value of 0.43, with the DE-ARC019 primer displaying the highest value (0.59). These findings suggest a substantial degree of genetic heterogeneity within the evaluated accessions, and the SSR markers employed in the study proved highly effective in detecting and characterizing this genetic variability. In conclusion, this study highlights the presence of significant genetic diversity in black fonio and provides valuable insights for future efforts aimed at its genetic improvement and conservation.

Keywords : genetic diversity, *digitaria iburua*, genetic improvement, simple sequence repeat markers, Nigeria, conservation

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