Genetic Variability and Diversity Analysis for Yield Attributing and Biochemical Parameters of Sorghum (*Sorghum bicolor* L.) Genotypes

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Abstract: The experiment was carried out during summer season 2019 at Centurion University of Technology and Management, Odisha, to estimate the genetic variability and diversity in 20 sorghum genotypes. A wide range of variation for 14 yield attributing traits including 4 quality parameters (chlorophyll, antioxidants, flavonoids and HCN) were observed among the genotypes. High to moderate phenotypic and genotypic coefficient of variation were recorded for yield, panicle weight, panicle length, 1000 seed weight, total chlorophyll, and total flavonoids. High heritability accompanied by relatively high genetic advance as percent of mean was observed for yield, panicle length, panicle weight, leaf length, plant height, 1000 seed weight, days to 50% flowering, total chlorophyll, total flavonoids, and total antioxidants. D^2 analysis grouped the 20 genotypes into four distinct clusters. Cluster I and cluster IV, respectively, contained highest (6) and lowest (4) number of genotypes. The maximum and minimum inter-cluster distance was noticed between cluster II and IV (150.99) and between cluster III and IV (66.26), respectively. Panicle weight (72.11%) followed by 1000 seed weight (9.98%) and total chlorophyll (2.63%) showed maximum contribution towards total divergence among the genotypes. Genotypes of cluster IV were the best performing in correspond to yield and its components while, cluster II was finest in respect of maturity and biochemical characters. Hence genotypes of cluster IV and II may further be utilized in breeding programmes for evolving sorghum varieties with high yield and quality.

Keywords: D^2 analysis, Genetic diversity, Genotypes, Variability