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Genetic Variability and Heritability Among Indigenous Pearl Millet (Pennisetum Glaucum L. R. BR.) in Striga Infested Fields of Sudan Savanna, Nigeria

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Abstract : Pearl millet (Pennisetum glaucum L. R. Br.) is a cereal cultivated in arid and semi-arid areas of the world. It supports more than 100 million people around the world. Parasitic weed (Striga hermonthica Del. Benth) is a major constraint to its production. Estimated yield losses are put at 10 - 95% depending on variety, ecology and cultural practices. Potentials in selection of traits in pearl millets for grain yield have been reported and it depends on genotypic variability and heritability among landraces. Variability and heritability among cultivars could offer opportunities for improvement. The study was conducted to determine the genetic variability among cultivars and estimate broad sense heritability among grain yield and related traits. F1 breeding populations were generated with 9 parental cultivars, viz; Ex-Gubio, Ex-Monguno, Ex-Baga as males and PEO 5984, Super-SOSAT, SOSAT-C88, Ex-Borno and LCIC9702 as females through Line × Tester mating during 2017 dry season at Lushi Irrigation Station, Bauchi Metropolitan in Bauchi State, Nigeria. The F1 population and the parents were evaluated during cropping season of 2018 at Bauchi and Maiduguri. Data collected were subjected to analysis of variance. Results showed significant difference among cultivars and among traits indicating variability. Number of plants at emergence, days to 50% flowering, days to 100% flowering, plant height, panicle length, number of plants at harvest, Striga count at 90 days after sowing, panicle weight and grain yield were significantly different. Significant variability offer opportunity for improvement as superior individuals can be isolated. Genotypic variance estimates of traits were largely greater than environmental variances except in plant height and 1000 seed weight. Environmental variances were low and in some cases negligible. The phenotypic variances of all traits were higher than genotypic variances. Similarly phenotypic coefficient of variation (PCV) was higher than genotypic coefficient of variation (GCV). High heritability was found in days to 50% flowering (90.27%), Striga count at 90 days after sowing (90.07%), number of plants at harvest (87.97%), days to 100% flowering (83.89%), number of plants at emergence (82.19%) and plant height (73.18%). Greater heritability estimates could be due to presence of additive gene. The result revealed wider variability among genotypes and traits. Traits having high heritability could easily respond to selection. High value of GCV, PCV and heritability estimates indicate that selection for these traits are possible and could be effective.

Keywords : variability, heritability, phenotypic, genotypic, striga
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