

Microsatellite marker assisted molecular and morpho-physiological genetic diversity assessment in 38 genotypes of sesame (*Sesamum indicum* L.)

ABSTRACT

Identification of genetic diversity and their relationships among breeding materials is crucial in crop improvement strategies. In this study, 38 sesame genotypes were characterized for their genetic diversity. The results revealed significant variations among various traits such as plant height, maturity, capsule plant⁻¹ and seeds capsule⁻¹. The number of capsule plant⁻¹ showed significant positive correlation with seeds capsule⁻¹. The highest heritability was found for the numbers of capsules plant⁻¹ (98.67%). The 38 genotypes were separated into six distinct clusters. Comparison within the populations of the cluster IV and those of cluster VI had the highest capsules plant⁻¹, seeds capsule⁻¹ with enormous genetic diversity. For molecular characterization, 7 microsatellite markers and 5 SSR primers with polymorphism were finally chosen for genetic diversity analysis. Altogether, 19 alleles were identified among the 38 genotypes, and the average number of alleles per locus was 3.80. The lowest and the highest numbers of alleles were 3 and 5, respectively. The polymorphism information content (PIC) ranged from 0.3201 to 0.5934 and SI-ssr30 showed to be highest at 0.5934. The UPGMA based clustering depicted a significant variation at molecular level among the sesame genotypes, having a coefficient of similarity between 0.29 and 1.00. The present study confirmed that extensive genetic diversity existed among the sesame genotypes and valuable agronomic traits may result in the development of high yielding genotypes.