GENETIC VARIABILITY AMONG LANDRACES OF SESAME IN ETHIOPIA

ABSTRACT

Sesame (*Sesamum indicum* L.) is an ancient oil crop that has been referred to as the 'Queen of oilseeds' by virtue of its high quality oil. Ten Simple Sequence Repeats (SSRs) markers were used to study patterns of genetic variation within and among 50 sesame populations representing the existing Ethiopian collections. The number of alleles ranged from 6 to 17, with an average of 12.1 per locus. The Polymorphism Information Contents (PICs) of the markers ranged from 0.393 to 0.820. The observed heterozygosity (Ho) for landraces and cultivars ranged from 0.060 to 0.440 and 0.120 to 0.260, with a mean of 0.234 and 0.193, respectively, indicating the existence of higher heterozygosity within the landraces than cultivars. Landraces (He=0.377) showed higher Nei's average genetic diversity than the cultivars (He=0.305). The fixation index (Fst) values for the landraces and cultivars were 0.427 and 0.26, respectively, indicating that genetic divergence between populations was smaller than genetic divergence within. High outcrossing of 45 and 46.4% for landraces and cultivars, respectively, indicates that both landraces and cultivars are line mixtures and segregants of past outcrossing results. A Neighbour-Joining dendrogram based on Modified Rogers' Distances (MRD) and a principal coordinate analysis based on a simple dissimilarity matrix, points towards some grouping based on geographical origin. The established SSR markers will be very useful for further diversity analyses among a large landrace collection of Ethiopian sesame and in the establishment of a core collection. Moreover, existence of great genetic variability between the landraces is a good starting point of sesame crop improvement programs in Ethiopia.

Key Words: Markers, *Sesamum indicum*, simple sequence repeat

Recent Publications (Minimum 5)

1. Daniel Endale Gebremichael.2016. Sesame (*Sesamum indicum* L.) Breeding in Ethiopia. Ethiopian Institute of Agricultural Research, Addis Abeba, Ethiopia.

2.Desawi Hdru Teklu, Sentayehu Alamerew Kebede and Daniel Endale Gebremichael. 2014. Assesment of Genetic Variability, Genetic Advance, Correlation and Path Analysis for Morphological Traits in Sesame Genotypes. Asian Journal of Agricultural Research, ISSN 1819-1894.

3. Gebremichael, D.E and Parzies, H.K. 2011.Genetic variability among landraces of sesame in Ethiopia. African Crop Science Journal, Vol. 18, No. 4, pp. 111 – 124.

4. Daniel Endale Gebremichael. 2011. Genetic diversity among landraces of sesame (SesamumindicumL.): Diversity study using Microsatellite marker. LAP LAMBERT Academic publishing GmbH & Co.KG.Saarbrücken, Germany.

5. Daniel Endale Gebremichael. 2011. Sesame research under irrigation. Oilseeds:Eengine for Economic Development. Ethiopian Institute of Agricultural Research, Addis Abeba, Ethiopia.

Biography

Daniel has his expertise in improvement of lowland oil crops using both conventional and molecular breeding methods. He received two M.Sc. degrees from Hohenheim University, Germany and Hebrew University, Israel. Currently he is working as a researcher on lowland oil crops breeding and genetics department in Ethiopian Institute of Agricultural Research.

E-mail: danend2000@yahoo.com