

VERIFICATION OF VARIETAL PURITY IN MAIZE SEEDS USING RAPD-PCR TECHNIQUE

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ABSTRACT

Laboratory experiments Randomly Amplified Polymorphic DNA (RAPD-PCR) was carried out during the 2010 season at the Farm of Faculty of Agriculture, Mansoura Univ., and Laboratories of Seed Tech. Res. Sec., Field Crops Research Institute, ARC. to estimate the varieties purity in Single Cross 10 (SC10) from three different sources. RAPD-PCR products from five maize genotypes generated by random primers A03, B05, B09, B11 and B16. The five RAPD primers produced 51 bands in the five genotypes, 17 of them were polymorphic and 34 were monomorphic. RAPD can identify markers for cultivars 4 and 5. Cultivar 5 has two cultivar-specific RAPD markers at 904, 303 b.p. of primers A03 and B11. While, cultivar 4 has one marker at 1327 b.p. of primer A03. Primers A03 and B05 produced 5 polymorphic bands, meanwhile primers B11 and B16 produced 2 polymorphic bands. Primers with higher polymorphic bands are more efficient in studying genetic diversity and discrimination the genotypes. Cluster analysis for similarity degree separated the studied genotypes into two main clusters, the first cluster included all the studied genotypes except G1 While it in a separate cluster. The dendrogram based on RAPD analysis indicating that the difference of band patterns was a genetic trait controlled by the nuclear genes. The F1 electrophoregram could be predicted by those of the two parents. The band pattern of the F1 hybrids was identical with that produced from mechanically mixed extract of the two parent inbreds and this procedure could be used in corn cultivar identification and as a test for genetic purity. From this study it could be clear many problems in producing S.C.10 for following reasons (The genetic similarity ranged from 83 - 95 %, Maximum genetic similarity coefficients (96 %) were observed in G3 and G5 and minimum genetic similarity coefficients (83 %) were observed in G1 and G4), and there is a heterozygosity because of (detasseling of female parent is not completely 100 %, pollination is unaccomplished, pollen may be carried by the wind from other parent, or both of them and the high genetic proximity between the parental inbred lines).

Key Words: Seed Verification, Maize, Rapd-Pcr Technique