

PCR - RAPD SUFFICIENTLY SENSITIVE MARKERS TO DETECT GENETICAL VARIABILITY OF POTATO GENOTYPES RESISTANT AND SUSCEPTIBLE TO EARLY BLIGHT DISEASE

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ABSTRACT

Crop genetic diversity is under increasing pressure from urban development, disease, and climate change, while monocropping (agricultural practices focusing on a few high-yielding varieties) leaves food supply open to threat. Little to no genetic diversity makes crops susceptible to widespread disease, as happened during the Irish Potato Famine, when the late blight pathogen wiped out entire crops of the dominant potato variety, and one million people starved to death. Random Amplified Polymorphic DNA (RAPD) marker technique is easy and quick, and requires no prior sequence information. In tuber bearing *Solanum* species, RAPD markers have been seen to be sufficiently sensitive to detect genetic variation. The goal of the present study was an attempt to establish a genetic diversity among early blight, *Alternaria alternata*, resistant and susceptible potato genotypes based on molecular markers with the aid of the RAPD-PCR technique. Such information may lead to the development of more reliable methods for potato breeding programs against early blight disease. Genetical diversity analysis of the potato cultivars by RAPD profiles showed that, they are of the great variations. In this manuscript, 20 primers were used for genetical diversity analysis of the potato cultivars, out of which, ten primers showed polymorphism. . The total number of amplified DNA bands varied between 5 (primer OPA-6) and 13 (primer OPA-17) with the average of 8 bands per primer. The polymorphism rate was 15.38 - 40. PCR amplified product bands ranged from 400 bp to 2000 bp. The resistant cultivars of Ramous, Marfona, Santé and Sheppedy, showed similar polymorphism in average range of 600-2000bp. Whereas, tolerant cultivars such as Santana, Maradona and Boren showed similar polymorphism in average range of 400-1600 bp. Also, the susceptible cultivars showed similar polymorphism in average range 400-1500 bp. A maximum similarity value of 93% was observed between resistant cultivars, whereas tolerant and susceptible cultivars also, were with more than 90% similarities. The Ramous cultivar with other two, Granulla and Cosima were found to be genetically most diverse (33%). The cluster analysis and coefficients using UPGMA confirmed the polymorphisms results too.

Keywords: Genetics, Pcr, Potato, Rapd, Early Blight



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