

STUDY OF GENETIC VARIATIONS OF *In vitro* MICROPROPAGATION STAGES OF KUMQUAT (*Citrus japonica* Thunb.)

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ABSTRACT

The experiment was carried out in the Biotechnology Laboratory of the Agricultural Research Department, Baghdad Governorate, Iraqi Ministry of Science and Technology. In the current study, Randomly Amplified Polymorphic DNA (RAPD) technology with eight primers was used to detect genetic differences between the *in vitro* micropropagation stages of kumquat. The fruit of the kumquat tree is a desirable fruit for its nutritional value and economic importance to most regions of the world. The use of molecular marker technology has proven to be useful in analyzing genetic relationships. The work steps included isolating and purifying the DNA of the young leaves of plantlets and mother plants used in the research and revealing the differences between the replicated fragments of them for each micropropagation stage, which was evaluated using random amplified polymorphic DNA (RAPD). The results of genetic analysis with RAPD indicators showed that there is a clear difference in the number of DNA replication bands and their molecular weights, depending on the primer used. The total number of different bands was 148 for all the primers used. The studied samples were divided into two main groups A and B, the percentage of similarity between the micropropagated plantlets and the mother plants was 100%. Group A contained the mother plant, while group B was divided into two subgroups, B1 and B2. Group B1 included the two stages of initiation and multiplication, and group B2 was the only one with the acclimatization stage. The study showed the use of RAPD technology of DNA fingerprinting in the assessment of genetic homology and genetic identification of kumquat plantlets in all micropropagation stages that one of the effective techniques that will help researchers in the citrus selection, effective management, and conservation of genetic resources.

Keywords: Nitiation; primer; plantlet; shoot multiplication; RAPD technology.