

Investigating the Effects of Medium, Sterilization and Hormonal Treatment on Micropropagation of Some Apple (*Mallus Domestica* Borkh.) Rootstocks

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Abstract

Background and Objectives

In order to increase yield in apple orchards, multiplication of rootstocks is essential, and it depends on the availability of a simple and easy proliferation method of rootstocks. The study investigated the effect of disinfection, culture condition and plant growth regulators on the rate of contamination, number of lateral branches, stem length, number of leaves, callus creation and the rate of branch creation of rootstocks MM106, MM111 and B9.

Materials and Methods

A factorial experiment was carried out as a completely randomized design with three replications. Surface sterilization of explants with different concentrations of mercuric chloride and sodium hypochlorite (mercuric chloride 0.1% for 3 minutes and ethanol 70% for 30 seconds; mercuric chloride 0.1% for 5 minutes and ethanol 70% for 30 seconds; NaOCl 0.75% for 15 minutes and ethanol 70% for 30 seconds) was done and then explants were cultivated in modified MS, WPM and DKW mediums. The evaluated characters were infection percent of explant, number of lateral branches, stem length, percentage of callus induction and number of leaves. Data were analyzed using SAS software. The analysis of variance on the test data was performed at 5% level and comparison to the middle of the Duncan test.

Results

Results showed that using a mercuric chloride (0.1%) and ethanol (70%) respectively for 3 Minutes and 30 Seconds achieved the least contamination. Results showed significant differences between plant hormone and rootstocks for traits. In this test, the modified MS medium with 0.1 mg/L BA hormones with the largest percentage growth had more successful establishment. Average comparisons showed that rootstock MM106 in terms of all traits had a significant difference with other rootstocks. The highest stem length, number of leaves and callus creation were shown in rootstock MM106. In order to investigate the effect of hormone levels on branch creation, different levels of BAP (6-Benzylaminopurine) and IBA (Indole-3-butyric acid) were used. The best medium was the culture containing 0.1 milligrams per liter IBA plus 2 milligrams per liter BAP.

Discussions

In general, the present results showed that genotypes respond differently to *in vitro* conditions. The rootstock B9 by the above method showed better response to branch creation trait than other genotypes.

Keywords: *Apple, Rootstock, In vitro, Establishment and proliferation.*