University of Zabol
Graduate school
Faculty of Agriculture
Department of Horticulture science and Landscape

The Thesis Submitted for The Degree of Master of Science
(In The Field of Horticulture science)

Title:

Effects of Ventilation, Silicon and Sucrose Concentration on in vitro Growth and Development of *Thymus vulgaris* L.

Supervisor:

Dr. D. Ramezan

Dr. M. Rahimi

Advisors:

Dr. Z. Mohkami

Dr. Y. Farrokhzad

By:

A. Moradi

8 October 2022

Abstract:

The garden thyme plant (*Thymus vulgaris* L.) belongs to the mint family (Lamiaceae). Garden thyme is considered as a valuable and useful plant due to having a large amount of effective substances in medicine, and limited studies have been conducted in relation to the in vitro propagation of this plant. In order to investigate the effects of ventilation, silica and sucrose concentration on the in vitro growth and development of garden thyme (*Thymus vulgaris* L.), a research based on a completely randomized design in the factorial format of three factors where the first factor includes ventilation at two different levels (with ventilation and without ventilation) the second factor includes silica with four levels (0, 1.5, 3 and 6 mg/l), the third factor includes sucrose with three levels (7.5, 15 and 30 g/l) and the control (no ventilation) tested it placed. After washing with dishwashing liquid, the seeds were washed three times with distilled water and then the seeds were treated with benomyl fungicide 2 grams per liter of water for 45 minutes. In the continuation of the test, 1.5% sodium hypochlorite was kept on the shaker for 8 minutes and then rinsed three times with distilled water. Then it was treated under a laminar hood for 30 to 60 seconds in 70% ethanol alcohol and rinsed three times with autoclaved deionized water twice and then on the medium of Morashik and Skok (1962) with 0.05 mg/liter. Gibberellic acid was cultured. Morphological, physiological and biochemical traits were evaluated, and the results showed that in the simple effects of traits, root fresh weight, percentage of explant contamination, and percentage of seedling survival in sucrose treatment, and in the double effects of traits, number of roots, percentage of root regeneration, and root fresh weight. , branch length, number of stomata, flavonoid and chlorophyll b and in the triple effects of root dry weight, proline and chlorophyll a were significant at 5% probability level.

Keywords: *Thymus vulgaris*, ventilation, silica, sucrose, tissue culture