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The Thesis Submitted for the Degree of M.Sc (in the field of Agronomy Science)

**The evaluation of interaction effects of drought stress
and foliar application with salicylic acid on
morphological properties, yield, components of yield and
percentage of essence of medical plant; Black cumin**

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Abstract:

Drought stress is a major environmental stress with inhibits the growth of plants and limits crop production. When plants are exposed to drought stresses, a variety of reactive oxygen species (ROS), which cause oxidative damage in plants are generated. Compounds which are able to reduce the damaging effects of various stresses, such as drought stress should be of great importance from both theoretical and application points of view. The result obtained in the last few years strongly prove that salicylic acid (SA) could be a very promising and protective compound for the reduction biotic and abiotic stresses sensitivity of crops, because under stress condition it has been found to mitigate the damaging effects of various stress factors in plants. In this research drought stress is accomplished with Gypsum Blocks and calibrated them that is accomplished with measurement of electrical resistance (OHM) and weighted moisture percentage that harmonized with it. Also to study the role of salicylic acid to reduce oxidative damaging of oxygen species, different concentrations of salicylic acid are consist of: 0 (control), 5, 10 and 15 Micro molar are used in foliar application form. The results of this research showed that when Black cumin is exposed to drought stress, it caused reduction 29/06% on the grains in one folicules, 27/95 % in harvesting index, 49/78% in the number of grains in one herb, 5/97% in the height of the herb, 34/21% in the number of the leaves, 19/81% in the number of folicules on the herb and 22/11% on (RWC). But this research showed that drought stress in third level (70% fc) caused increasing 18/75% on essence percentage that is adjustable with the other research. salicylic acid in third level (S3: 10 Mm) caused increasing 28/96% in the number of leaves, 11/71% in the height of the herb, 92/53% in the number of grains in one herb, 64/9% in (HI), 25/41% in the number of grains in one folicules, 13/57% in (RWC), 16/07% in dry weight of the herb, 90% in essence percentage and 22/87% in the number of folicules. The interaction of salicylic acid in third level (10 Mm) and drought stress in middle level (70% fc) could increase 200% on essence percentage, 54/57% in the number of folicules in one herb. Therefore the application of exogenous protective compound such as (SA) could increase the antioxidant capacity of this plant against stress condition. **Key words:** Gypsum Block, drought stress, essence percentage, salicylic acid, Black cumin