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**In vitro evaluation and determination of salinity
tolerance threshold of black cumin (*Nigella sativa* L.)**

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Abstract

Nigella sativa L is an economically valuable medicinal plant, but salinity can limit the regions under cultivation of this crop. Therefore, identifying the appropriate tissue culture method for this plant can be useful for selecting salinity tolerant cultivars. In order to evaluate the tolerance to salinity and determine the salinity tolerance threshold of seedlings obtained from the black cumin plant, this research was carried out in two stages. In the first experiment, the leaves and terminal meristem were placed in MS medium containing different concentrations of BAP and 2.4-D hormones. The experiment was a factorial based on a completely randomized design with three replications. The results of the first experiment showed that the use of BAP and 2.4-D hormones in MS culture medium caused complete destruction of leaf and stem microsamples; But the Apical meristem remained. Then, different concentrations of BAP hormone combined with 0.5 mg of 2.4-D hormone were used to induce in vitro regeneration among the terminal Apical meristem microsamples. The results of this experiment showed that application of 2 mg/l of benzyl adenine purine combined with 0.5 mg / l of 2.4-D increased the growth index of *nigella* cultivars. The results of the second experiment showed that salinity reduced some morphological characteristics (stem length, root length, fresh and dry weight of shoots and roots of different *nigella* cultivars in vitro, but with increasing sodium chloride concentration, the amount of soluble sugars and proline increased.

Key words: Salinity stress, Apical meristem, Explant, Tissue culture