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Dose-dependent of melatonin and gibberellin priming improve seed germination and growth indices of *Salvia officinalis* L.

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Abstract

The importance of medicinal plants is increasing day by day and their consumption is increasing. One of the obstacles in cultivating these plants is the low germination of their seeds due to dormancy. Melatonin and gibberellin are the most important growth regulators which have decisive roles in the growth and development of plants. To identify an effective priming dose of these regulators on seed germination, seedling growth and dry matter of *Salvia officinalis* L. in the lab experiment, effect of ten levels of hormone priming (50, 100, 150, and 200 ppm of gibberellin and 50, 100, 150, 200, 250, and 300 mM of melatonin) along with control in the complete random design with three replicates were tested. Results showed that although all levels of melatonin and gibberellin priming caused increase in seedling growth indices (percentage and germination rate, seed vigour index, root and plumule length, and seedling dry weight), compared to control, their effects strongly was dose-dependent. The least and the most germination percentage belonged to control (30 %) and 300 mM melatonin (90 %) levels, respectively. Albeit, the application of melatonin priming at 100 mM had the highest seed vigour index (18.4 %) and root length (2.04 cm) due, seemingly, to low plumule length, highest increase in seedling dry weight compared to control level was obtained at 200 ppm gibberellin (3-fold) and 300 mM melatonin (2.5-fold), respectively. Findings of the present study reveal that the priming of *S. officinalis* seeds by 300 ppm of melatonin and 200 mM of gibberellin may be played a crucial role in the germination and growth indices of this aromatic plant even under stress conditions.

Keywords: Growth indices, hormone priming, seed germination, seedling dry weight, vigour index

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