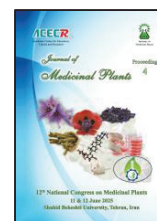




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Evaluating the Role of *Bacillus subtilis* in Alleviating Salt Stress in *Melissa officinalis*

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ABSTRACT

Melissa officinalis, commonly known as lemon balm, is a medicinal plant with valuable aromatic properties. However, its growth is significantly affected by salinity stress. This study aimed to investigate the impact of *Bacillus subtilis* on enhancing the salinity tolerance of Iranian lemon balm. A greenhouse experiment was conducted using a Randomized Block Design with 14 treatments (seven salinity levels: 0, 2, 4, 6, 8, 10, and 12 dS/m) and four replications, involving bacterial inoculation applied individually and synergistically with different salt concentrations. Key measured factors included plant height, chlorophyll content, proline accumulation, total biomass, and antioxidant enzyme activity. The results revealed that the application of *Bacillus subtilis* significantly improved salinity tolerance, especially at 6 dS/m, where treated plants exhibited a 21% increase in biomass and 23% higher chlorophyll content compared to the non-inoculated control group. Furthermore, proline levels increased by 20%, indicating enhanced stress adaptation. These findings highlight the potential of *Bacillus subtilis* as a promising biological treatment for sustainable cultivation of medicinal plants under saline condition

References

1. Liu, Y., Jiang, W., Zhao, W., Xu, L., Wang, M., Jian, J., Chen, X., Wang, E., & Yan, J. (2024). Effects of biochar application on soil properties and the growth of *Melissa officinalis* L. under salt stress. *Scientia Horticulturae*, 338, 113704.
2. Olaniran, A. F., Adeyanju, A. A., Olaniran, O. D., Erinle, C. O., Okonkwo, C. E., & Taiwo, A. E. (2024). Improvement of food aroma and sensory attributes of processed food products using essential oils/boosting up the organoleptic properties and nutritive of different food products. *Applications of Essential Oils in the Food Industry*, 107–116.
3. Wójcik, M., Dziki, D., Gawlik-Dziki, U., & Różyło, R. (2021). Development of no-salt herbal bread using a method based on scalded flour. *LWT*, 145, 111329.