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Salinity tolerance in *Scolymus hispanicus L*: preliminary findings from a soilless cultivation

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Introducing edible salt-tolerant plant species to professional cultivation is a concept compatible with the need of improving the resilience of food systems to shocks and stresses, which is required to tackle eminent global challenges, such as water scarcity and climate change (Cuevas et al., 2019). Hydroponic systems can contribute to substantial savings of water, nutrients, and space, while increasing yield and produce quality (Savvas and Gruda, 2018). In the current study, we examined the feasibility of cultivating the wild edible green *Scolymus hispanicus L*. under moderate levels of salinity in a soilless cultivation system. The experiment was installed in October 2019, in an unheated saddle roof double-span greenhouse, as a completely randomized block design with 4 treatments and 4 blocks per treatment (Papadimitriou et al., 2020). Treatments were formed by supplying a standard nutrient solution (NS) with four NaCl concentrations (0.5, 5.0, 10.0, and 15.0 mM), resulting in electrical conductivities of 2.2, 2.8, 3.2, and 3.8 dS m^{-1}, respectively. Measurements of chlorophyll fluorescence (Fv/Fm) and relative chlorophyll levels (SPAD), which were performed to assess the photosynthetic capacity of leaves, did not indicate any significant differences between the non-salinized control (0.5 mM NaCl) and the salinity treatments (5.0, 10.0, and 15.0 mM NaCl), until 60 days after seedling transplanting (DAT). However, by 90 DAT, salinity levels of 10.0 and 15.0 mM significantly reduced leaf chlorophyll levels, as indicated by the SPAD indices, compared to 5.0 and 0.5 mM NaCl in the supplied NS. Moreover, by 90 DAT, the chlorophyll fluorescence (Fv/Fm) was significantly reduced at the salinity level of 15.0 mM compared to 0.5 and 5.0 mM. Nevertheless, no salinity treatment had a significant impact on leaf fresh weight, root fresh weight, rosette diameter, number of leaves and post-harvest storability in plants harvested 90 and 120 DAT, compared to the control. Based on these results, *S. hispanicus L*. exhibits a considerable resilience to moderate salinity and can be considered a promising candidate plant for introduction in hydroponic cropping systems.

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References

Cuevas, J., Daliakopoulos, I.N., del Moral, F., Hueso, J.J., Tsanis, I.K., 2019. A Review of Soil-Improving

Cropping Systems for Soil Salinization. Agronomy 9, 295. https://doi.org/10.3390/agronomy9060295

Papadimitriou, D., Kontaxakis, E., Daliakopoulos, I., Manios, T., Savvas, D., 2020. Effect of N:K Ratio and Electrical Conductivity of Nutrient Solution on Growth and Yield of Hydroponically Grown Golden Thistle (Scolymus hispanicus L.). Proceedings 30, 87.https://doi.org/10.3390/proceedings2019030087

Savvas, D., Gruda, N., 2018. Application of soilless culture technologies in the modern greenhouse industry - A review. Europ. J. Hort. Sci. 83, 280-293.