Influence of Zn foliar application on growth characteristics and essential oil yield of basil (*Ocimum basilicum* L.) under salinity stress

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Abstract

Mass production of medicinal and aromatic plants under hydroponic systems and especially in areas with saline soils is very important. An experiment was conducted to evaluate the interaction of salinity stress and foliar application of zinc (Zn) on hydroponically-grown basil (*Ocimum basilicum* L.). The factorial experiment was arranged as randomized complete blocks design, with two salinity levels (0 and 50 mM NaCl) and three Zn levels (0, 100 and 200 mg/L as $ZnSO_4,7H_2O$) and three replications. Some growth characteristics such as height, leaf surface area, fresh and dry weight of leaves, stem and whole plant, chlorophyll index, harvest index and yield of dry leaves per m^2 were measured. After extraction of essential oil, the oil yield was calculated based on oil content in the plant. The results showed that salinity stress adversely affected all growth characteristics as well as essential oil content and yield. Despite the generally accepted hypothesis, Zn application not only had no impact on reducing the negative effects of salinity, but also showed no significant difference between the control plants (no salinity). The highest essential oil content and yield were recorded for control plants. Therefore, it is concluded that under the hydroponics system, basil is sensitive to 50 mM salinity, and Zn foliar application up to 200 mg/L had no positive impact on the reduction of negative effects of salinity. Thus, control nutrient solution has appropriate amount of Zn for salinity stress conditions.

Keywords: Medicinal plants, Hydroponics, Sensitivity to salinity.

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