

Changes in Morpho-Physiological, Biochemical and Essential Oil Components of Summer Savory (*Satureja hortensis* L.) Irrigated with Refined Sewage Water

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Replacing irrigation water sources with refined sewage water is increasing due to water scarcity challenge for producing horticultural crops. In this research, changes in morphological, biochemical and essential oil components of summer savory (*Satureja hortensis* L.) plants irrigated with well water, refined sewage water and combination of well water and refined sewage water with the ratio of 1:1 investigated in a completely randomized design with 3 replications in 2018. The results showed that irrigation had a significant effect on measured parameters. The highest and the lowest total fresh weight, root fresh weight, shoot and root length and also plant height were obtained in plants irrigated with well water and refined sewage water, respectively. The most fresh and dry weights and biomass of aerial parts were obtained in well water + refined sewage water. The highest stem diameter was obtained in refined sewage water. The most and the least leaf area and essential oil yield (2.84%) were obtained with well water + refined sewage and well water treatments, respectively. The most leaf chlorophyll index (44.75) and total phenol (1.96 mg GAE 100 g⁻¹) were obtained in refined sewage water. Analyses of essential oil components resulted in detection of 47 components. Carvacrol (53.27%) was the dominant components that obtained in refined sewage water treatment. Overall, the use of combination of well water and refined sewage water is recommended for savory production due to improvement in growth characteristics, increasing the amount of essential oil and also reducing water consumption.

Keywords: Chlorophyll index, Essential oil, Flowering date, Plant height, Total phenol.

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