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Effect of olive mill wastewater enriched with vermicompost and pomace on the mineral content of onion, garlic and spinach*

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Abstract

Olive mill wastewater (OMW) obtained in olive oil production contains substances that are harmful to the soil. It is ecologically and economically important to convert OMW and olive mill waste (olive pomace), applied together with organic materials such as vermicompost, into a useful form. In this study, the effects of OMW enriched vermicompost and pomace on the mineral content of onion, garlic and spinach, and the possibilities of reducing the negative effects of olive mill wastewater were investigated. The study concluded that vermicompost and pomace added to OMW reduced its negative effects on plants. For example, the highest copper value (1.54 mg kg⁻¹) in onion was obtained from OMW-V2 treatment, and the highest sodium value (280.06 mg kg⁻¹) was obtained from OMW-V1 treatment. In cv. Matador spinach, the highest nitrogen value (2.72%) was received from OMW2 treatment, while the highest values of phosphorus (245.51 g 100g⁻¹), sodium (39.69 mg kg⁻¹), and iron (51.52 mg kg⁻¹) were obtained from the P1 treatment; the highest potassium (1592.22 mg kg⁻¹) and copper (1.98 mg kg⁻¹) values were obtained from OMW-P2 treatment. A two-way hierarchical cluster analysis (HCA) revealed that a high degree of similarity based on the mineral content was observed between treatments: OMW-V3 and V1, V1 and OMW-P1 and OMW-V3 and OMW-V4 in the Uzunbacak local spring onion variety, Kirmizibacak local garlic variety and cv. Matador spinach, respectively. The results are valuable in revealing the possibilities of economic use of pomace and olive mill wastewater.

Keywords: garlic, olive mill wastewater, onion, pomace, spinach

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