

Effect of Jasmonic Acid on the Content of Medicinally Active Substances in Rosemary Leaves Grown in Contaminated Soils

Ahmed A. KADHIM¹, Ali Ahmed Hussein ALMYALI^{2,3}, Ali S. HASSOON¹

¹ *Al-Mussaib Technical College, Al-Furat Al-Awsat Technical University, Iraq*

² *Department of Biological Science, College of Sciences, University of Kerbala, Karbala, Iraq*

³ *College of Pharmacy, University of Alkafeel, Najaf, Iraq*

SUMMARY. Two separate factorial experiments were carried out in the greenhouse to study the effect of different concentrations of Jasmonic acid (0, 1, 2, and 3) mg. L⁻¹, and adding different levels of lead and cadmium as toxic heavy metals to the culture medium (0, 5, and 10) g. kg⁻¹ of soil from the weight of the pot and the interaction between them in the content of medicinally active substances in rosemary leaves using a completely randomized design C.R.D. with three replications. The results showed the superiority of the combination that the concentrations of 2 and 3 mg. L⁻¹ of Jasmonic acid interfered with levels 5 and 10 g. kg⁻¹ of soil induced a significant increase in the studied active compounds (rosmarinic acid, carnolic acid, carnolic acid and norigingol) in soils contaminated with lead and cadmium separately compared with the control treatment.

RESUMEN. Se llevaron a cabo dos experimentos factoriales separados en el invernadero para estudiar el efecto de diferentes concentraciones de ácido jasmónico (0, 1, 2 y 3) mg. L⁻¹, y añadiendo diferentes niveles de plomo y cadmio como metales pesados tóxicos al medio de cultivo (0, 5 y 10) g. kg⁻¹ de suelo a partir del peso de la maceta y la interacción entre ellos en el contenido de sustancias medicinalmente activas en hojas de romero utilizando un diseño completamente al azar C.R.D. con tres repeticiones. Los resultados mostraron la superioridad de la combinación que las concentraciones de 2 y 3 mg. L⁻¹ de ácido jasmónico interfirió con niveles de 5 y 10 g. kg⁻¹ de suelo indujo un aumento significativo de los compuestos activos estudiados (ácido rosmarínico, ácido carnólico, ácido carnólico y norigingol) en suelos contaminados con plomo y cadmio por separado en comparación con el tratamiento control.

KEY WORDS: heavy elements, jasmonic acid, medically effective compounds, rosemary.

* Author to whom correspondence should be addressed. *E-mail:* com.ahmd22@atu.edu.iq