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ORIGINAL ARTICLE

STUDY OF THE PHYSIOLOGICAL INTERACTIONS OF TREATMENT WITH THE ANTIOXIDANTS CITRIC ACID AND GLUTATHIONE TO REDUCE OIL POLLUTANTS ON DATE PALM TREES *PHOENIX DACTYLIFERA* L.

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Abstract: The study was conducted in one of the orchards in the Al-Dair District, Nahran Omar District, and Basra Governorate to determine the effectiveness of ground treatment with citric acid and spraying with the antioxidant glutathione to reduce the harmful effects of oil pollutants on Al-Sayer date palm trees. Citric acid was added at two concentrations of 200 and 400 gm. $palm^{-1}$ and glutathione was sprayed at a concentration of 100, 200, and 300 mg. L^{-1}. The results showed that the treatment T7 (add citric acid at a concentration of 400 g .$Palm^{-1}$, glutathione spray with a concentration of 300 mg. L^{-1}) significantly reduced the concentration of heavy metals such as lead, nickel, cadmium, cobalt, and chromium as well as oil pollutants, hydrocarbons, alkanes, amino acids proline, and phenolic compounds in the leaves of the date palm of the Sayer variety compared to the control treatment, which recorded the highest values of the above qualities. T7 treatment was considerably superior in terms of chlorophyll a, b pigment concentration, total chlorophyll in the plant, carotene and anthocyanin concentration, peroxidase enzyme activity, and glutathione concentration in the leaves. while the comparison treatment is based on the lowest values for the plant pigments and the aforementioned attributes, respectively. The usage of antioxidants such as citric acid and glutathione has played an important role in buffering the detrimental effects of oil pollutants on Sayer palm trees, which has resulted in improved tree development and increased production under severe environmental conditions.

***Key words*:** Citric, Glutathione, Al-sayer, Pollution, Date palm.

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