

IMPACT OF ARZEW AIR POLLUTION IN SITU AND METALLIC TRACE ELEMENTS IN GREENHOUSE CULTIVATION ON PHENOLIC COMPOUNDS OF *OLEA EUROPEA*

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This work primarily aims to investigate the impact of abiotic stress resulting from two types of pollution on polyphenols in olive trees (*Olea europaea*). The study was conducted in two parts. Initially, olive leaves were collected from various stations in the Arzew petrochemical region to assess in situ impact. Subsequently, in second part, Oléastre olive shrubs were subjected to contamination with lead and copper at different concentrations within a controlled greenhouse environment. This research aims to study how simulated abiotic stress from pollution affects the phenolic compounds of olive trees. with a focus on two types of plant materials: fruits and leaves of Sigoise variety collected in the field and young Oléastre olive plants subjected to metal contamination in greenhouse. Phytochemical screening revealed the presence of various flavonoids such as rutin, quercetin, and luteolin in samples analyzed both in situ and in the greenhouse. Biochemical assays demonstrated a significant increase in total phenolic compounds and flavonoids in olive trees located near the petrochemical rejection zone. In the greenhouse, the content of polyphenols and tannins was notably higher in samples contaminated with 8000 parts per million of lead compared to controls. Conversely, flavonoid levels were significant in samples contaminated with 4000 parts per million of lead. Analysis of copper contamination indicated that the highest flavonoid contents were associated with lower copper concentrations, suggesting a potential chelation effect in reducing the metal in olive tree leaves. The findings suggest that polyphenols can serve as ecophysiological markers, particularly in disturbed ecosystems.