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EFFECT OF IRRIGATION WITH TREATED URBAN WASTEWATER ON AGRO-PHYSIOLOGICAL PARAMETERS OF MAIZE (*Zea mays* L.)

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Abstract

This study aims to evaluate the effect of irrigation with treated urban wastewater (TWW) on some agro-physiological proprieties in maize (*Zea mays* L.) plants. Therefore, a pot experiment was conducted under natural conditions for eight weeks using different TWW ratios (25%, 50%, 75% and 100%) against natural water (NW) as control. First, physicochemical parameters of NW and TWW were monitored. Then, agro-physiological responses of maize plant in terms of plant height, shoot fresh and dry weight, leaf area, relative water content and photosynthetic pigments were assessed. Overall, results revealed that TWW irrigation positively affected growth and physiological plant parameters compared to control (NW), with a concentration depending manner. Indeed, the highest growth improvement was obtained in plants watered with 75% TWW compared to control NW. This was confirmed by the close significant positive correlation between water irrigation and plant physiological responses. However, there was no significant difference between plant irrigated with 100% TWW and those watered with NW. Moreover, the oxidative stress markers in terms of hydrogen peroxide and malonyldialdehyde contents were significantly ($p < 0.05$) higher in plants irrigated with 100% TWW than those irrigated by either diluted TWW (25%, 50% and 75%) or NW, which indicating stress conditions that could be linked to the salinity of TWW. In conclusion, the irrigation with the suitable concentration of TWW could be a sustainable approach to maintain maize plant productivity in the context of drought stress.

Key words: drought stress, maize, oxidative stress, plant growth, treated wastewater

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