

# **Response of kapok seedlings grown under water stress to antioxidant foliar application**

**By**

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## Abstract

The present experiments were performed throughout two successive seasons of 2020/2021 and 2021/2022 at a Private Farm in Beni-suef Governorate - Egypt. It intended to response of Kapok (*Ceiba pentandra*, L.) seedlings to irrigation with secondary treated sewage water (TSW), agricultural drainage water (ADW) and Nile irrigation water (NIW) either directly (100%) or mixed TSW or ADW with NIW (25, 50 and 75 %). In addition to using foliar glycine betaine (GB) application at (0.0 mM and 50.0 mM) on vegetative growth parameters, physiological characters, photosynthetic pigments, leaf elements content, anatomical structures of leaf and antioxidant activity. Results showed irrigation with directly (100%) of TSW and ADW decreased plant height, number of leaves per plant, stem diameter/plant, fresh weight of stem, leaves and roots, root diameter, dry weight of stem, leaves and roots, leaf area index, root length, Chl a, Chl b, carotenoids, membrane stability index MSI, relative water content RWC, relative chlorophyll content (SPAD value), leaf thickness, leaf mid-vein, N, P, K and Ca content, but increased free proline content, total phenolic content, Na, Cu, Ni, Mn, Zn, Pb content and antioxidant activity. As well, GB significantly increased all vegetative growth parameters, Chl a, b, carotenoids, MSI, SPAD, RWC, free proline content, total phenolic content, leaf thickness, leaf mid-vein and N, P, K, Ca content and antioxidant activity, as well as reduced Na, Cu, Ni, Mn, Zn and Pb content in leaf. But also with irrigation Kapok seedlings at TSW or ADW and NIW at 25, 50% give better results likewise irrigation with NIW for all parameters. Combination with GB and water treatments give better results at 50 mM GB and TSW or ADW at 25, 50% mixing with NIW.

Key words: Kapok- Treated sewage water- Agriculture drainage water- Glycine betaine