environmental sciences proceedings

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Abstract

Physiological and Biochemical Responses of Four Contrasting Origins of Argan Tree to Severe Water Stress †

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† Presented at the 3rd International Electronic Conference on *Forests* — Exploring New Discoveries and New Directions in Forests, 15 to 31 October 2022. Available online: https://iecf2022.sciforum.net.

Abstract: The argan tree (Argania spinosa (L.) Skeels) is an endemic species of Morocco, widely adapted to the arid and semi-arid climate of the southwest. Our research involves studying and characterizing some physiological and biochemical traits of argan tolerance to water stress. For this reason, we measured physiological parameters related to the water state (foliar water potential and relative water content of the leaves) and biochemical parameters involved in osmoregulation (proline, total proteins and total sugars) and photosynthesis (chlorophylls) in plants from four contrasting origins of argan tree (Bouizakarne, Agadir, Essaouira and Berkane) cultivated under water stress induced by cessation of irrigation. The results showed that the basic and minimal foliar water potential, relative water content as well as chlorophyll content significantly decreased in plants under severe water stress compared to control plants, whereas a significant accumulation of proline and total soluble sugars was noted in stressed plants. Nonetheless, inter-origin differences were recorded for some parameters studied. The study of water-stress-adaptive traits in argan tree can help to understand the tolerance mechanisms and discriminate between the most drought tolerant provenances in order to rehabilitate degraded argan forests.

Keywords: Argania spinosa (L.) Skeels; water stress; origin; tolerance; leaf water potential

Citation: Mouafik, M. Physiological and Biochemical Responses of Four Contrasting Origins of Argan Tree to Severe Water Stress. *Environ. Sci. Proc.* **2022**, *4*, x. https://doi.org/10.3390/xxxxx

Academic Editor: Rodolfo Picchio

Published: date