Faculty of Geotechnical Sciences and Environmental Management

Master's Thesis

Melatonin and salicylic acid as seed priming agents in *Solanum Lycopersicum* plants grown under optimal, saline and drought conditions

Lagios Stylianos

Limassol, June 2024

CYPRUS UNIVERSITY OF TECHNOLOGY

FACULTY OF GEOTECHNICAL SCIENCES AND ENVIRONMENTAL MANAGEMENT

DEPARTMENT OF AGRICULTURAL SCIENCES, BIOTECHNOLOGY AND FOOD SCIENCE

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Approval Form

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Presented by

Lagios stylianos

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Abstract

In current times where climate change is more prevalent than ever it is evident that plants must survive under increasingly harsh conditions. Priming compoinds are proven to be capable of decreasing the effects of abiotic stresses such as drought, salinity, toxins, heat and cold. This study focuses on the effect of melatonin applied to Tomato (*Solanum lycopersicum)* seeds. To study the possible beneficiary effects of melatonin a series of assays and analysis were conducted. These included physiological measurements such as chlorophyll fluorescence, stomatal resistance, fresh and dry weight. Also, Biochemical assays where the concentrations of several stress indicator molecules such as MDA, Peroxide and Proline were measured. Enzymatic assays were also performed to measure the activity of enzymes that play a crucial role in the protection of plants such as SOD, CAT and P5CS. The results show that seed priming with melatonin can enhance the protection of plants by enabling oxidative stress response pathways quicker and more effectively.

Contents