THE EFFECTS OF BIOSTIMULANTS AND DEFICIT IRRIGATION ON CHEMICAL COMPOSITION OF GREENHOUSE TOMATO

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INTRODUCTION

➢ Tomato fruit are a rich source of bioactive compounds, including phenolic compounds, vitamin C, and provitamin A, which are associated with protective effects against certain diseases and potentially contribute to cancer prevention.
➢ The present study evaluated the effect of a biostimulant formulation applied at different rates on the chemical composition and nutritional properties of greenhouse tomato fruit grown under deficit irrigation conditions.

METHODOLOGY

➢ The applied biostimulant consisted of CaO and SiO_2, along with a calcium mobilization and translocation factor, as well as trace elements including Mo, Bo, and Zn. The tested treatments included different concentrations of the biostimulant formulation (TR1, TR2, TR3, TR4; 15 L/ha, 10 L/ha, 5 L/ha and 2.5 L/ha, respectively), as well as the Control treatment (no biostimulants added).
➢ Two different irrigation regimes were applied including normal irrigation (100% of field capacity) denoted as RI, while deficit irrigation is referred as DI (60-70% of field capacity).
➢ Tomato plants (*Solanum lycopersicum* cv. Ben-Hur were established on May 2021, at the experimental greenhouse of the University of Thessaly in Velestino, Greece. Plants were transplanted directly in soil.
➢Harvest took place on September 29, 2021.

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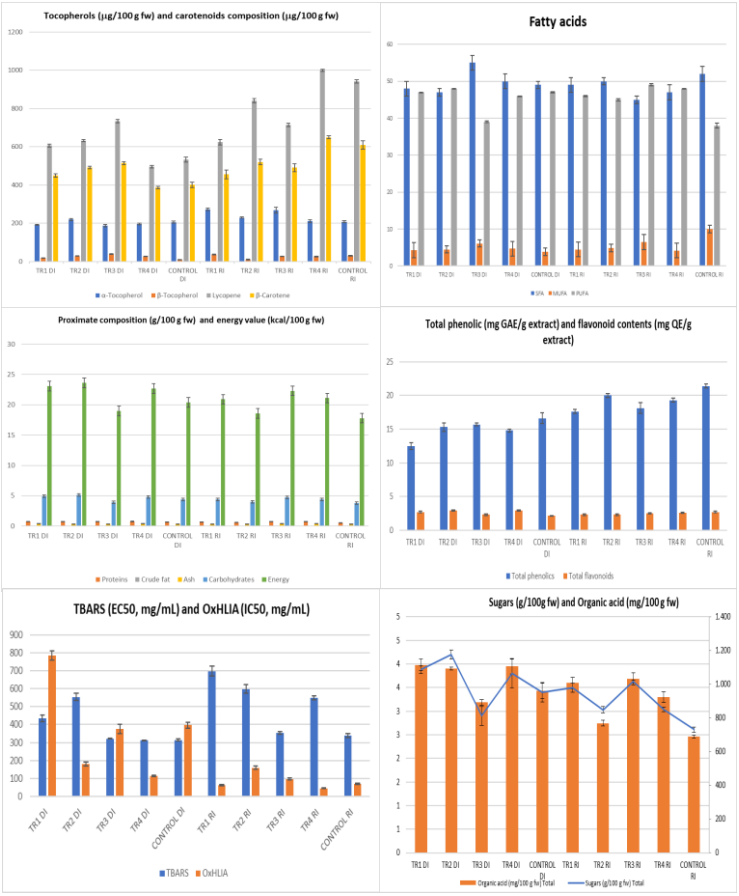
RESULTS



CONCLUSIONS

➢ In terms of energy value, the values ranged between 17.8 and 23.6 kcal/ 100 g fresh weight (fw), with TR2 x DI having the highest energy value, while Control x RI had the lowest one.
➢ TR4 x DI treatment demonstrated low lipid peroxidation (TBARS assay), suggesting enhanced oxidative stability and potentially longer shelf life, while TR1 x RI treatment recorded the highest antioxidant capacity (OxHLIA assay), indicating its superior ability to scavenge free radicals.
➢ The sugars and organic acids composition also varied among the samples, with TR2 x DI and TR1 x DI treatments exhibiting the highest sugars and organic acids contents, respectively. These parameters are associated with the taste of tomato fruit and could be used to improve the quality of the edible fruit. Regarding tocopherols content, TR1 x RI and TR3 x DI showed the highest α-tocopherol and β-tocopherol contents, respectively, while lycopene and β-carotene were the highest in TR4 x RI treatment.
➢ In summary, our findings indicate that the tested concentrations of the biostimulant formulation can alleviate the negative effects of deficit irrigation and improve the nutritional value and chemical composition of tomato fruit.