THE EFFECT OF DEFICIT IRRIGATION AND BIOSTIMULANT APPLICATION ON CHEMICAL COMPOSITION AND NUTRITIONAL VALUE OF PROCESSING TOMATO

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INTRODUCTION

- As one of the most popular vegetables in the world, tomatoes are rich in lycopene, phenolics, organic acids, vitamins and many other beneficial components.
- **The aim of the present study was to evaluate the effects of five biostimulant formulations were and two levels of irrigation on processing tomato.**

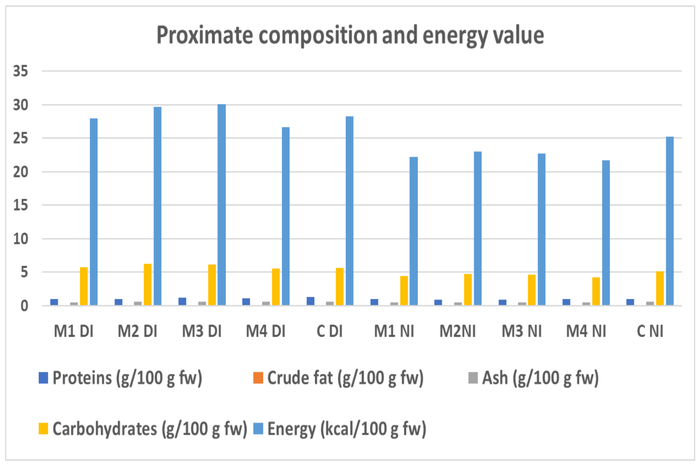
METHODOLOGY

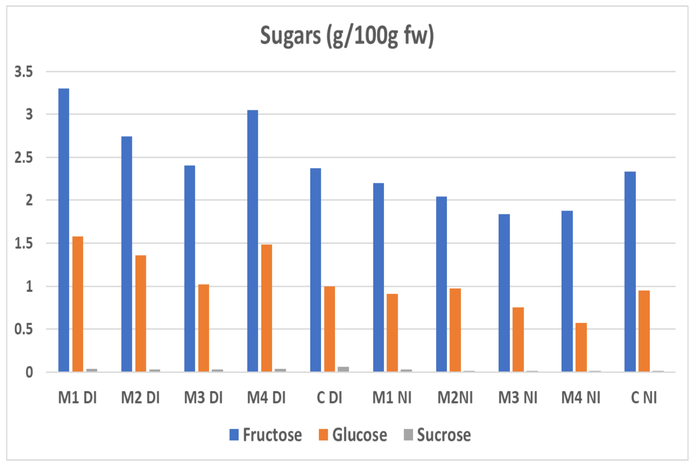
- Tomato seedlings (cv. Heinze 1162) was transplanted on May 2021 at the experimental farm of the University of Thessaly in Velestino, Greece.
- The harvest took place on August 6, 2021.
- Five formulations of biostimulants were used (M1: Proteins and amino acids of plant origin + Carboxylic Acids, M2: Proteins and amino acids of plant origin + Algae extract (*Laminaria digitata* + *Ascophyllum nodosum*), M3: Humic and fulvic acids + Algae extract (*Laminaria digitata* + *Ascophyllum nodosum*), M4: SiO_2, which were applied foliar by spraying.
- Four applications were implemented (2 before flowering and 2 at the beginning of fruit setting).
- Two levels of irrigation were applied (100% of the maximum field capacity (NI) and 65-70% of the maximum field capacity (DI)).

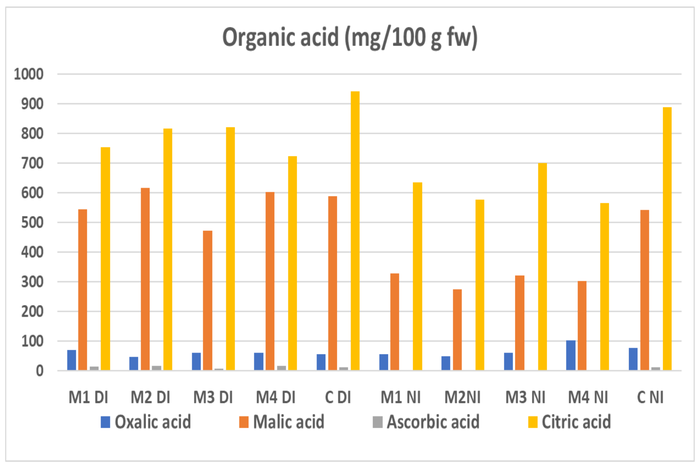
CONCLUSIONS

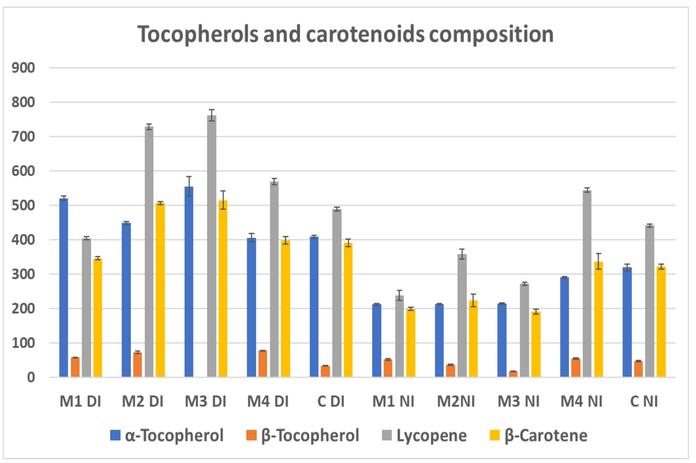
- DI resulted in higher protein, ash, carbohydrates and energy content in the case of M3 and M5, M2, M2 and M3 and M3 treatments, respectively.
- Similarly, DI increased free sugars content for M4, M1, Control and M1 treatments, respectively, while the same trend was recorded for organic acids content, except for oxalic acid where the highest content was detected in NI x M4 treatment.
- A-tocopherol was the most abundant vitamin E isomer, while the highest content was recorded for DI x M3 treatment. The same conditions were also the most beneficial for lycopene and carotene contents.
- The main fatty acids detected were palmitic, linoleic and oleic acid which increased for DI and for M3 in the case of palmitic acid, as well as for M1 treatments in the case of the other two fatty acids.
- The highest total phenolic compounds content was recorded for DI x M3 treatment, whereas total flavonoids were benefited by NI x M1 treatment.
- Deficit irrigation resulted in lower EC_{50} values (higher antioxidant activity) for the control and M3 treatments, for TBARS and OxHLIA assays, respectively.
- Our results indicate a positive effect of DI on most of the tested parameters, while specific biostimulants such as M3 significantly improved chemical composition and antioxidant activity, as determined by OxHLIA assay. Therefore, it could be suggested that both agronomic tools studied could mitigate water stress effects while improving the overall nutritional value and bioactivity of the final product.

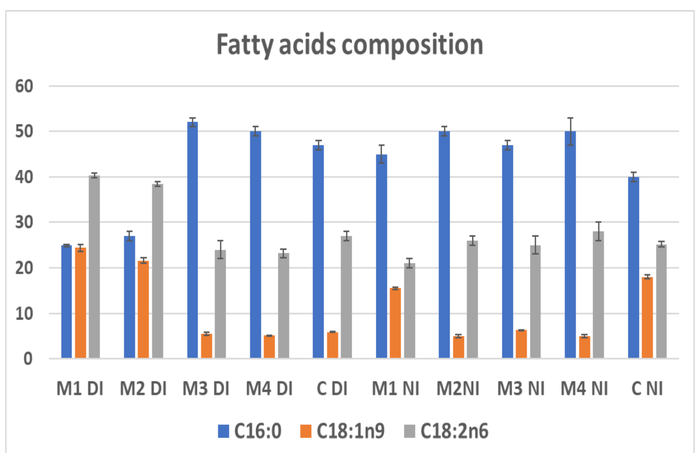
RESULTS

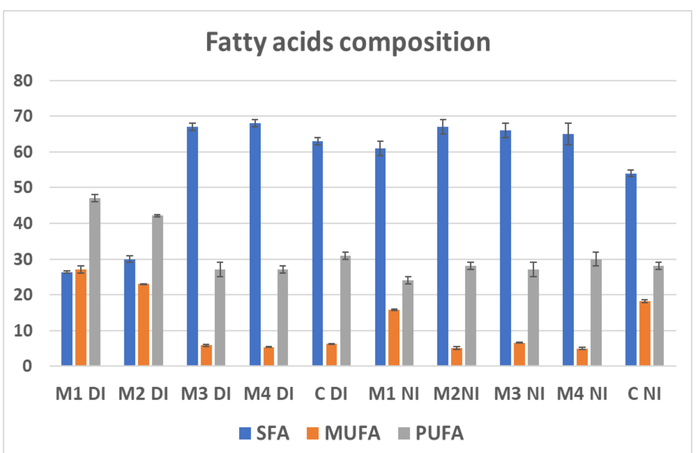


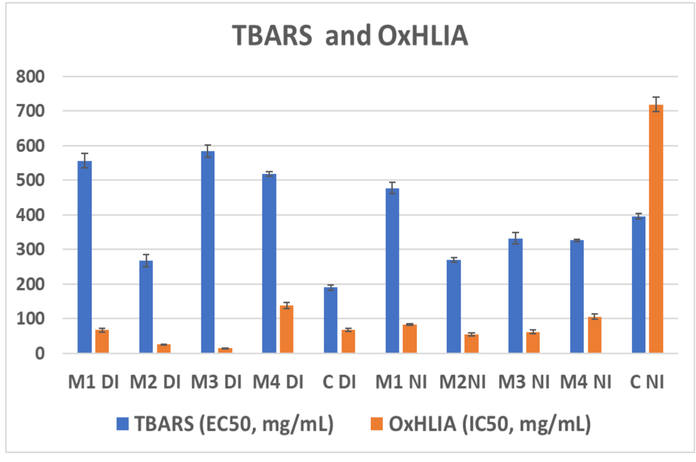


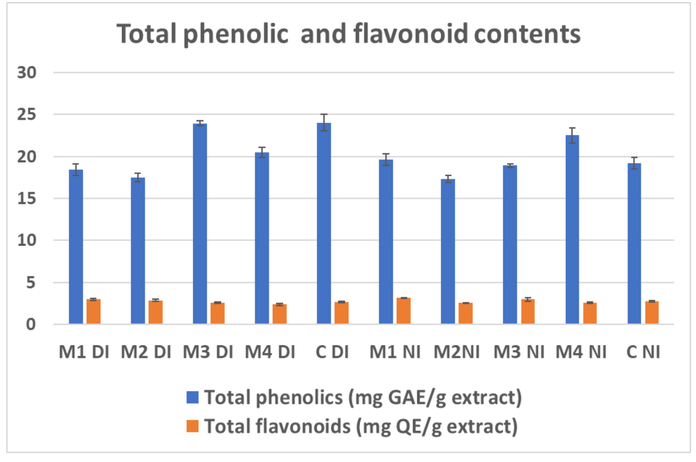












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