

# Orange carbon dots change the total phenolic content in maize

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## 1. Introduction

Carbon dots (CDs) are considered a green alternative to metal nanoparticles because they can be used where metal nanoparticles cannot be applied. Orange carbon dots (oCDs), synthesized from citric acid and o-phenylenediamine as precursors, are organic spherical nanoparticles with a lot of applications in various biomedical purposes such as drug delivery, bioimaging, and sensing. Ease of preparation, high photoluminescence, solubility in water, and biocompatibility are their main advantages.

## 2. Objectives

The main aim of this research was to investigate the effect of oCDs on total phenolic content (TPC) in maize as an agricultural species. TPC reflects the contribution of phenolics as a group of secondary metabolites participating in the regulation of plant growth and the defense responses. Also, it is one of the main indicators of oxidative stress which can cause a metabolic disorder in plants.

## 2. Results and discussion

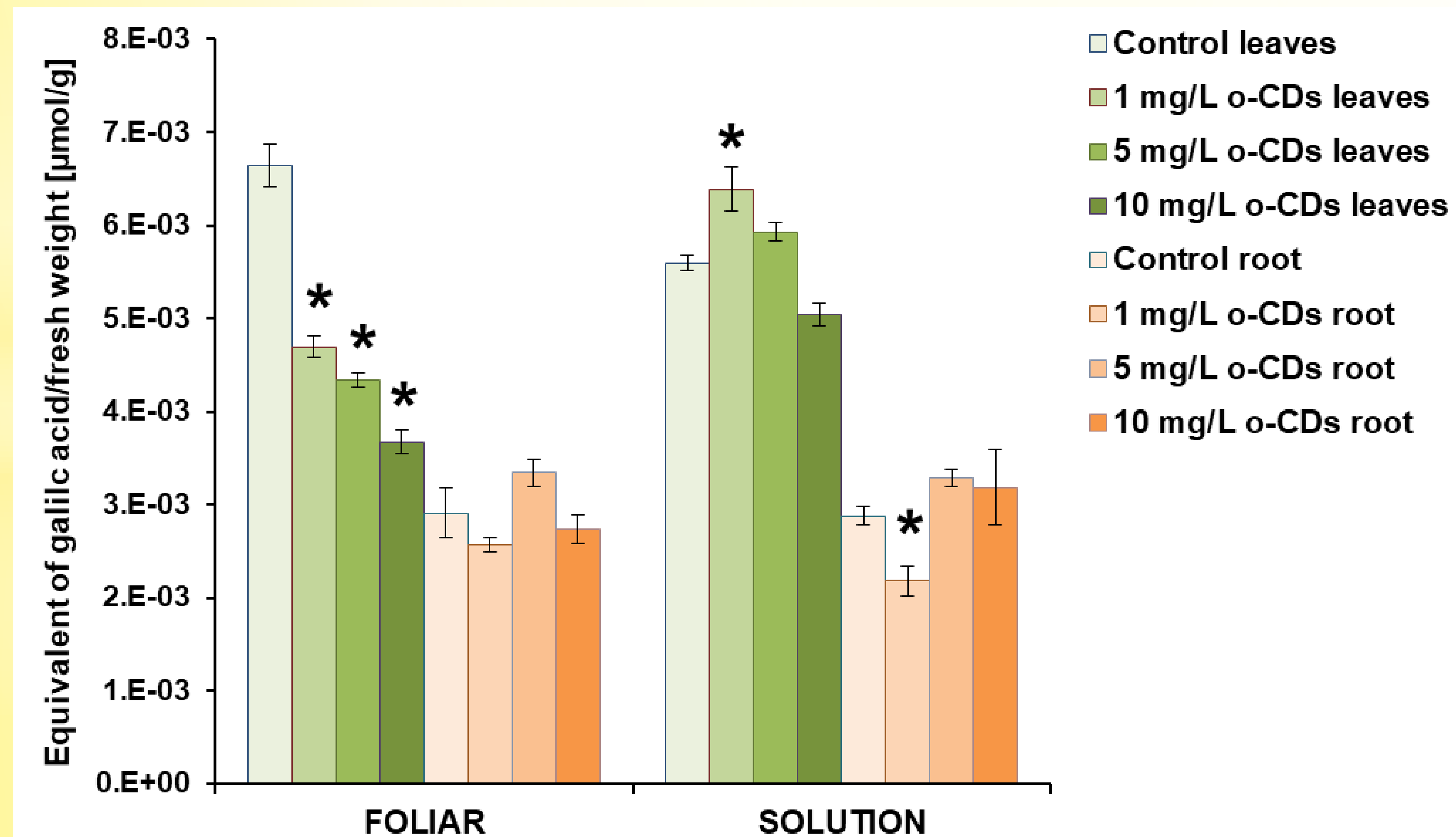
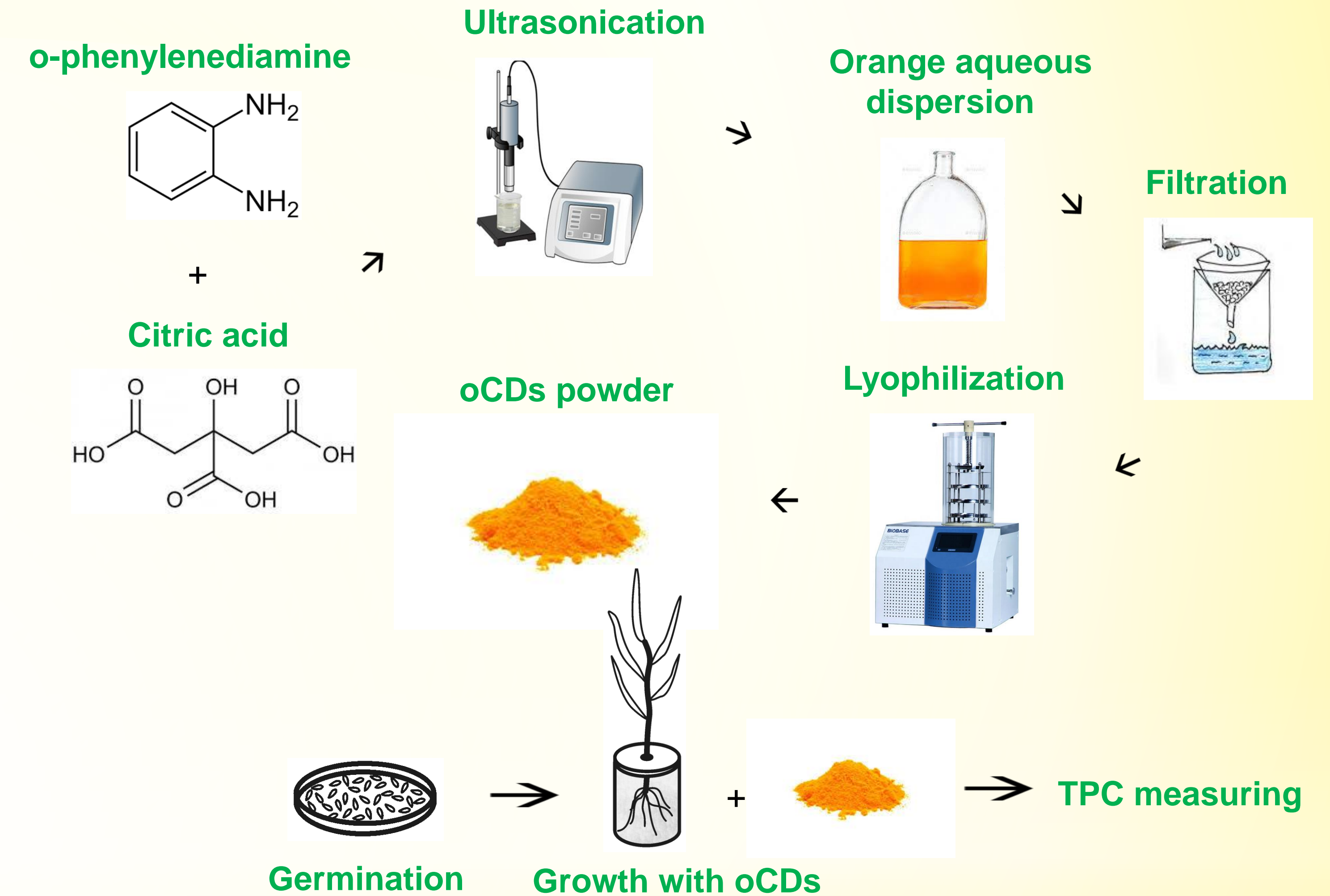


Fig. 1. Total phenolic content in maize shoot and root after the treatment with oCDs

## 3. Materials and methods



## 4. Conclusions

- Foliar application of oCDs induced the decrease of TPC in the leaves at all used concentrations (1, 5, and 10 mg/L); TPC did not change in the roots at any used concentration
- Solution application of 1 mg/L oCDs induced the increase of TPC in leaves and decrease in roots
- The higher efficiency was achieved with 1 mg/L in the foliar treatment

## 5. References & Acknowledgements

- Milenković I., Borišev M., Zhou Y., Spasić Z. S., Leblanc R., Radotić K. (2021) Photosynthesis enhancement in maize via nontoxic orange carbon dots, *Journal of Agricultural and Food Chemistry*, *In press*.
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