



Effect of Orange-Carbon Dots on Plants' Antioxidative Response in Green Beans Cultivated in the Soil

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Orange-carbon dots (o-CDs) have the potential to enhance photosynthesis and productivity in plants playing an important role in agroindustry¹. Therefore, it is of interest to estimate regarding possible oxidative stress they may initiate in plants. This study reports the impact of o-CDs on the parameters of secondary metabolism - total antioxidative activity (TAA) and total phenolic content (TPC) measured in the extract of green bean leaves after foliar o-CDs' application at 1 and 5 mg/L. The plants were cultivated in the soil in outdoor conditions and the leaves were collected for analysis after three cycles of o-CDs treatments. Both tested parameters are indicators of antioxidative disorder in plants. TAA is related to the contribution of different low-molecular-weight antioxidants including phenolic acids, vitamins, sugars, etc.,^{2,3} while TPC includes phenolic secondary metabolites and participates in the regulation of plant defense responses.^{3,4} The results revealed an increased TAA in green beans only at 5 mg/L of o-CDs. At the same time, the TPC did not change after any of the two applied o-CD concentrations. The results may be evidence of the oxidative stress increase in green bean leaves with enhanced o-CDs concentrations, indicating that the 1 mg/L is more appropriate for use.

Keywords: green beans, orange-carbon dots, total antioxidative activity, total phenolic content

References

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