

Original Article

Influence of Sodium and Maturity Stage on the Antioxidant Properties of Cauliflower and Broccoli Sprouts

Antoanela PATRAS^{1*}, Vasile STOLERU¹, Razvan Vasile FILIMON^{1,2}, Silvica PADUREANU³, Elena Liliana CHELARIU¹, Costas G. BILIADERIS⁴

¹University of Agricultural Sciences and Veterinary Medicine of Iasi, Faculty of Horticulture, 3 Mihail Sadoveanu Alley, 700490 Iasi, Romania; apatras@uaiasi.ro (*corresponding author); vstoleru@uaiasi.ro; razvan_f80@yahoo.com; julia@uaiasi.ro

²Research Development Station for Viticulture and Winemaking, 48 M. Sadoveanu Alley, 700489 Iasi, Romania

³University of Agricultural Sciences and Veterinary Medicine of Iasi, Faculty of Agriculture, 3 Mihail Sadoveanu Alley, Iasi, Romania; silvyp27@yahoo.com

⁴Aristotle University of Thessaloniki, Faculty of Agriculture, University Campus, 54124 Thessaloniki, Greece; biliader@agro.auth.gr

Abstract

Sprouts are very rich in antioxidants (e.g. phenolic compounds) and their consumption is beneficial for humans' health. The sprouts' antioxidant properties are correlated to conditions of growth and maturity stage. The present study reveals the influence of maturity stage (5-, 7- and 9-day-old) and two sodium salts, NaCl and Na₂SO₄ (10 mM and 100 mM) on the antioxidant capacity and total phenolic content of cauliflower and broccoli sprouts. The analysed sprouts' extracts were obtained in two phases, using ethanol 70% with 0.01% hydrochloric acid. In the case of cauliflower, the 7 days germination leads to the highest total phenolic content and radical scavenging capacity. Broccoli sprouts revealed the most enhanced DPPH radical scavenging capacity and total phenolic content at 5-day-old. The two sodium salts, generally, had positive effects on global antioxidant status. It is highlighted both for broccoli and cauliflower, the stimulating effect of 100 mM Na₂SO₄ on the total phenolic content and soluble dry weight, but the DPPH radical scavenging activity was more important in the case of NaCl, than Na₂SO₄ treatments, except for cauliflower sprouts treated with 100 mM Na₂SO₄. In conclusion, germination under adequate salt stress is a protocol to be considered in order to improve antioxidant properties of broccoli and cauliflower sprouts, despite the non-convenient effects on the germination and sprouts growth. Further researches are needed to optimize the level and time periods of such treatments.