EFFECTS OF SULFATE SUPPLEMENT ON PHYTOCHEMICAL ACCUMULATION IN THE RADISH SPROUT

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Radish sprouts are recognized as wellness and health-promoting foods due to its high content of nutrients and bioactive compounds that includes vitamins, flavonoids and carotenoids. Sulfate supplement is essential for primary and secondary metabolism in cruciferous vegetables. In this study it was shown that radish sprout treated with sulfate supplement (K₂SO₄) synergistically enhanced the accumulation of carotenoids. The efficacy of spray of potassium sulfate with various concentrations (1 mM, 10 mM, 100 mM and 200 mM) and intensities during germination and growth of radish sprout were assessed. Radish sprout was treated for the duration of the growth period, on 7 days. The sulfate-treated sprouts exhibited significantly higher levels of carotenoid and antioxidant activity than control sprouts. There was a significant positive linear relationship between total carotenoids content and antioxidant activity (AOA). The total phenolics obtained were correlated to carotenoid content and with the DPPH radical scavenging activity values with $R^2 = 0.9370$ and $R^2 = 0.8707$, respectively. Spray application of 100 mM sulfate at growth was effective resulting in approximately 86.0% and 31.7% increase in carotenoid and antioxidant power, respectively. Also, in the fresh weight and length were same as under the 200 mM S-treatments. Results indicated that stress-induced carotenoid content and AOA were dependent upon sulfate concentrations. Exposure to combined abiotic stress could provide more AOA to radish sprout and be a less expensive alternative to genetic modifications and breeding programs.