STUDIES ON NUTRITIONAL COMPOSITION OF SOME CRUCIFERAE SEED SPROUTS

By

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ABSTRACT

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Sprouts have received increasing attention in recent years because of they are potential dietary value. Additionally, the efficient production of sprouts with high levels of phytochemicals and antioxidants is desirable. Therefore, studies were performed using some elicitation substances (biotic and abiotic) on the production and nutritional value of radish, rocket and broccoli. In order to increase the concentrations of bioactive compounds in broccoli sprouts, exogenous elicitors: calcium chloride, folic acid, ascorbic acid, selenium, chitosan and salicylic acid (SA) were sprayed at different concentrations during germination. The effects of the elicitors content on the proximate composition evaluation, on vitamin, total sugar, phenolic compounds and mineral of radish, rocket and broccoli seed sprouts (3, 5 and 7 days old) were determined in two experiments (2016 and 2017). Harvest elicitation could be done as soaking seeds in a water solution with the elicitor, applying exogenous spraying treatment over the leaves or in a hydroponic system. Elicitor nature, doses and time of treatments strongly affects the intensity of the plant response. Elicitors can stimulate different classes of secondary metabolites and affect in a different way the concentration of these compounds. A $CaCl_2$ elicitation, applied by soaking seeds at 5 µmol/L, resulted in a 9.48%, 26.72%, 6.55, 8.41% ,137.77 ppm and 78.53(mg/100g) increasing of moisture, protein, ash, fiber, sulfur, and vitamin C contents, respectively, in 7 day old radish sprouts as the main value of the two experiments (2016 and 2017). Treatments

with ascorbic acid at 250µmol/L increased rocket sprouts moisture, protein, ash and fiber contents by 7.28% 29.52%, 11.47% and 10.40% respectively in 5-day-old sprouts, while total sugars, reducing sugars and non-reducing sugars were increased with ascorbic acid at 500µmol/L on the in 5-day-old sprouts, 12.68%, 7.42 and 5.26%, respectively as the main value of the two experiments (2016 and 2017). Treatments of broccoli with chitosan at 100 ppm cleared that the moisture, protein, ash, fiber, calcium, potassium and total phenols of sprouts were increased by 9.40%, 33.57%, 11.64, 11.55%, 336.40 ppm, 196.27 ppm and 66.46 mg/100g, respectively as the main value of the two experiments (2016 and 2017). Therefore, treated sprouts with elicitors could be considered as useful tool for improving the growth characters and bioactive metabolites of radish, rocket and broccoli seed sprouts. Regarding their production of anti-cancer materials, as well secondary metabolic pathways respond to specific treatments with elicitors would be the basis for to enhance the production of secondary metabolites, to produce quality and healthy fresh foods.

Keywords: Elicitor, Sprout seeds, Crucifera, Phenolic compounds, Health and Chemical composition.