Effect of SiO2 on yield and phenolic profile of Tartary buckwheat

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Abstract:

The aim of this study was to enhance the Tartary buckwheat growth and phenolic profile by the application of SiO2 on pots in the glasshouse. The liquid of SiO2 were applied at three times after three weeks of sowing at ten days interval. The doses of the SiO2 was low (2.5 ml/5 L water), high (10 ml in 5 L water) and control experiment was done without SiO2. In this study, it is clearly shown that high dose of SiO2 increased the buckwheat plant growth including, plant height, leaf length and width, stem diameter, fresh weight and number of seed per plant compared to control treatment. In the same way, the total phenolic compound (1421 mg/100 g), total flavonoid (35.1 mg/100g), rutin (3,130 mg/100g) and DPPH (82%) in plant were also increased high dose of SiO2 compared to control (1,175 mg/100g, 31.9mg/100g, 860 mg/100g, 59%, respectively). Moreover, higher phenolic compound (1,421 mg/100g) and DPPH (82%) was observed in plant compared to seed (196 mg/100mg, 72 %, respectively). In the contrary, total flavonoid (36.2 mg/100g) and rutin (1,400 mg/100g) was higher in buckwheat seed compared to plant (35.1 mg/100g, 3,130 mg/100g, respectively). Finally, it is concluded that higher dose of SiO2 enhance buckwheat growth and phenolic profile. Further investigation is needed to evaluate the optimum dose of SiO2 according to soil conditions in the field.

Key Words: Tartary buckwheat, liquid SiO2, phenolic compound, flavonoid, rutin, antioxidant activity.