

**Effect of root-application of rice husk as a natural silicon (Si) source on the nutritional quality of bitter gourd (*Momordica charantia* L.)**

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Silicon (Si) has proven its beneficial effects on growth, yield and disease resistance in many agricultural crops. Synthetic Si in the form of potassium silicate, sodium silicate, calcium silicate etc. and natural Si sources like rice husk are being tested across the world to achieve such favorable effects. Our previous investigations revealed that the amendment of growth media with powdered raw rice husk (PRH) or rice husk ash (RHA) extends the shelf life of bitter gourd (*Momordica charantia* L.) by enhancing its physico-chemical properties and inducing resistance against postharvest fungal pathogens. These changes were associated with increased Si levels in fruits from rice husk-treated plants. Si application is also known to either improve or hinder uptake of certain nutrients depending on the crop. Aim of this study was to test the effect of rice husk application on some major nutrients in bitter gourd. *M. charantia* cultivar 'Matale green' was grown in pots containing sand: top soil: compost at 2:1:1 ratio. The growth medium was amended with rice husk in two different forms viz. PRH or RHA at a rate of 200 mg Si/ kg soil, once a week, up to 28 days. Growth medium without husk amendment served as controls. Each treatment consisted of 20 pots. Ten fruits from each treatment were harvested at standard harvesting maturity and crude protein, fat, fiber, total carbohydrates, ash, nitrogen (N), phosphorous (P), and potassium (K) of the fruit pericarp tissues were assayed using AOAC (Association of Official Analytical Chemists) methods. Data analysis was done by one-way analysis of variance. Total N, crude protein, fat and ash contents of fruits from husk-amended plants were significantly higher ( $p < 0.05$ ) than that of controls whereas the other parameters were not affected significantly by husk amendment. Accordingly, average total N content in PRH, RHA and controls were  $0.14 \pm 0.002$ ,  $0.13 \pm 0.001$  and  $0.08 \pm 0.002\%$  respectively. Means of the crude protein content ranged as  $0.94 \pm 0.12$ ,  $0.91 \pm 0.09$  and  $0.58 \pm 1.28\%$  in that order and the total ash content in PRH treated fruit ( $1.24 \pm 0.006\%$ ) was significantly higher than that of RHA treatments ( $1.12 \pm 0.01\%$ ) while the lowest ( $1.04 \pm 0.01\%$ ) was observed in control fruit. Crude fat content in control fruit ( $1.4 \pm 0.01\%$ ) was lower than that of husk amended samples and difference between PRH ( $1.8 \pm 0.07\%$ ) and RHA ( $2 \pm 0.05\%$ ) was not significant. Therefore rice husk can be suggested as an eco-friendly and less costly soil supplement which improves the protein quality of bitter gourd without any negative effect on its basic nutritional status.

**Keywords:** Bitter gourd, Nutrients, Rice husk, Silicon

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