

Comparative nutritional analysis of products developed from brinjal grown under canal water and sodic water treated with amendments

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Accepted : March, 2009

ABSTRACT

Quality of irrigation water affects the crop yield, physical characteristics and nutrient composition of vegetables. Present study, therefore was designed to observe the ameliorating effect of gypsum and farm yard manure on nutritional quality of products prepared with the brinjal grown under sodic water. Bulk samples of brinjal being grown under soil irrigated with canal water (control) and sodic water treated with gypsum and FYM to neutralize 50 % sodicity (G_1F_2) and to neutralize complete sodicity (G_2F_2) were obtained from the Vegetable Research Farm, CCS Haryana Agricultural University, Hisar. Three types of brinjal products *i.e.* *bharta*, *brinjal pakoda* and *brinjal potato vegetable* were developed and were analyzed for proximate composition and carbohydrate and dietary fibre profile. Contents of protein, fat, crude fibre, ash, carbohydrate and total soluble sugars among three types of brinjal products ranged from 11.70-19.82, 11.27-26.65, 5.50-15.55, 4.95-9.30, 39.88-55.84 and 3.40-4.66 per cent (DM), respectively. All three brinjal products prepared using brinjal irrigated with G_1F_2 treated water contained ($P < 0.05$) lower amount of protein, fat, crude fibre and total dietary fibre, but significantly higher contents of ash, carbohydrates, total soluble sugar, oxalic acid and polyphenols than those irrigated with canal water and G_2F_2 treated water. It may be concluded that use of amendments *i.e.* gypsum and FYM under sodic condition improved the nutrient composition of vegetable products prepared with brinjal grown under sodic water. Complete neutralization of sodicity with these amendments is required to produce the healthy vegetables and their products.

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Key words : Proximate, Brinjal products, Dietary fibre, Antinutrients, Sodic water, Gypsum, Farm yard manure

Brinjal (*Solanum melongena* L.) also known as Beggplant or aubergine belongs to the family Solanaceae. It is one of the most popular and principal vegetables crops commonly grown as annual plant all over the world. Brinjal, being quite high in nutritive value, has been an important component of human diet since ancient times and can be well compared with tomato (Anonymous, 2007). In India, area under brinjal cultivation is estimated at 0.51 million ha with total production of 8,200,000 Mt (FAO, 2005). *Bharta*, *brinjal pakoda*, baked brinjal and *brinjal potato vegetable* are main products prepared with brinjal. Quality of irrigation water affects the crop yield, physical characteristics (Rani *et al.*, 2008) and nutrient composition of vegetables being grown under that situation. Sodic water is characterized by low total salt concentration ($EC < 4$ dS/m), sodium absorption ratio (> 10 m.mol L^{-1}) and residual sodium carbonate (> 2.5 me/L). Continuous use of sodic water for irrigation as such causes soil sodification and at the same time it adversely affects the plant growth and yield of crop under most situations (Yadav *et al.*, 2002). Soil amendments like gypsum ($CaSO_4$) and FYM have been found useful under sodic water irrigation. Soil irrigated with sodic water for a long time becomes deficient in calcium and addition of gypsum to that soil meets that requirement. On the other hand, sodic water affects the physical properties of soil, in that

situation farm yard manure improves the physical properties of soil and further improves the performance of the crop. Though the researches have been done in India and abroad to observe the effect of sodic water on yield and quality of some crops, and use of amendments under sodic condition. But no research has been done on nutritional analysis of products prepared with vegetables grown under sodic water with the ameliorating effect of gypsum and farm yard manure. Present study, therefore was designed to observe the ameliorating effect of gypsum and farm yard manure on nutritional analysis of products prepared with the brinjal grown under sodic water.

METHODOLOGY

Procurement of material:

Bulk samples of brinjal variety (HE-12) being grown under soil irrigated with canal water (control) and soil irrigated with sodic water having RSC (Residual Sodium Carbonate) 11.5 meq/l, treated with gypsum and FYM *i.e.* (G_1F_2): 50% neutralization of RSC with gypsum + 20 tons FYM/ha and (G_2F_2): 100% neutralization of RSC with gypsum + 20 tons FYM/ha were obtained from the Vegetable Research Farm, CCS Haryana Agricultural University, Hisar. Three types of brinjal products, *bharta*, *brinjal pakoda* and brinjal potato vegetable were