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Evaluation of bell pepper (*Capsicum annuum* L. Var. *Grossum* Sendt.) Genotypes for quality traits in modified naturally ventilated polyhouse

Vimlesh Kumar*[1], Naresh Kumar Pathania[1] and Nimit Kumar[2]

[1]*Department of Vegetable Science & Floriculture, C. S. K. Himachal Pradesh Agricultural University, Palampur*
[2]*Department of Crop Improvement, C. S. K. Himachal Pradesh Agricultural University, Palampur*

ABSTRACT

The present investigation conducted with objective to assess the quality traits among fifteen genotypes traits viz., Ascorbic acid content (mg/100g), capsaicin content (%), chlorophyll content (mg/100g) and dry matter (%). Mean sum of squares due to genotypes were significant for all the traits except dry matter. Study revealed that for Ascorbic Acid content, Orobelle F_1 hybrid (111.97 mg/100 g) followed by Bomby F_1 hybrid (106.20 mg/100 g) were promising. Whereas, for capsaicin content (%), Bachata F_1 hybrid (0.038%) and Indam Mamatha F_1 hybrid (0.056 %) found were promising. Indam Mamatha F_1 hybrid (13.30 mg/100 g) had maximum chlorophyll content. In fact, lower capsaicin, high ascorbic acid content and chlorophyll content are desirable biochemical attributes and in the present study hybrids Orobelle and Bomby for ascorbic acid content, Indam Mamatha and Bachata for chlorophyll content and hybrids Bachata and Indam Mamatha for low capsaicin content offer promise.

Key words: Bell pepper, Ascorbic Acid, Chlorophyll Content, Capsaicin Content.

INTRODUCTION

Bell pepper (*Capsicum annuum* L. var. *grossum* Sendt.) a member of family Solanaceae, commonly known as sweet pepper or capsicum or *Shimla mirch* is native of Mexico with secondary centre of origin in Guatemala [1]. Bell peppers have a glossy exterior of different, vivid colours including green, red, yellow, orange purple brown to black. Green peppers are unripe bell peppers, while the others all are ripe, with colour variation based on cultivar selection. It was introduced in India by the Britishers in the 19th century in Shimla hills. Globally, it is cultivated over an area of 1.89 m ha with the production and productivity of 29.93 m tonnes and 15.77 tonnes including hot pepper respectively [2]. China is the world's largest producer followed by Mexico. In India, it is cultivated over an area of 0.79 m ha with the production and of 1.22 m tonnes including hot pepper [3]. Of late, bell pepper has attained a status of high value crop and occupies a place of pride among vegetables in India because of its delicacy and pleasant flavour besides being rich in fatty acids, flavonoids, volatile oil and carotene. It is rich in ascorbic acid and zinc, which are vital for a strong and healthy immune system. It is rich in vitamin A, rutin (a bioflavonoid), beta-carotene, iron, calcium and potassium. It also contains magnesium, phosphorus, sulphur, B-complex vitamins, sodium and selenium [4]. Sweet peppers are low in calories, high in complex carbohydrates and contain no fat. These are good source of dietary fibre, folate and manganese.

MATERIALS AND METHODS

The present investigation was undertaken in modified naturally ventilated quonset polyhouse at the Experimental Farm of Department of Vegetable Science and Floriculture, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur during winter summer, 2012-13. The fifteen genotypes of bell pepper were evaluated in modified naturally ventilated quonset polyhouse (25×10m) at Experimental Farm, Department of Vegetable Science and Floriculture which is situated at 32^0 6$^{'}$ N latitude and 76^0 3' E longitude at an elevation of 1290.80 m above mean sea level with East-West orientation. It is an ideal polyhouse with essential features like double door, side and top ventilation, drip

and fogging facility and internal shading with 50% green agro UV stabilized shade net. Agroclimatically, the location represents the mid-hill zone of Himachal Pradesh and is characterized by humid sub-temperate climate with high rainfall (2500 mm), of which 80% is received during June to September. Observations on the characters *viz.*, Ascorbic acid content (mg/100g), capsaicin content (%), capsanthin content (ASTA units), chlorophyll content (mg/100g) and dry matter (%) were estimated by taking sample of each entry in each replication. Ascorbic acid content was estimated at marketable green fruit stage by '2, 6- dichlorophenol-indophenol Visual Titration Method' as described [5]. The capsaicin content in the marketable green fruits was determined by Colorimetric method using Folin–Ciocalteau reagent described by [6]. The capsaicin concentration in different samples was noted from the standard capsaicin curve and finally the results were converted into percentage. Chlorophyll content of capsicum genotypes was determined as per procedure given by [6].

RESULTS AND DISCUSSION

Mean sum of squares due to genotypes were significant for all the traits except capsanthin content (ASTA units) and dry matter. On the basis of (Table1.) mean performance with respect to quality traits, maximum ascorbic acid content (111.97 mg/100 g) was recorded in hybrid Orobelle followed by Bomby (106.20 mg/100 g) and Paladin (104.83 mg/100 g). Indam Mamatha F_1 hybrid (13.30 mg/100 g) had maximum chlorophyll content followed by Natasha F_1 hybrid (12.00 mg/ 100 g), Bachata (11.94 mg/ 100 g) and Indian F_1 hybrid (11.84 mg/100g). However lower values of capsaicin were observed in hybrids, which varied from 0.038 % to 0.120 %. Aforementioned findings are also in close conformity with [8] and [9]. Whereas, Bomby F_1 Hybrid had maximum dry matter (6.57 %) followed by Indam Super Gold F_1 hybrid (6.50 %), Indam Mamatha F_1 Hybrid (6.38 %) and Paladin F_1 hybrid (6.35 %) whereas general mean was 6.12 % with a range 5.51 to 6.57 %. This trait did not exhibit significant variation among the genotypes studied. [10] have also reported non-significant variation for this trait which corroborate the present findings. In fact, lower capsaicin, high ascorbic acid content and chlorophyll content are desirable biochemical attributes and in the present study hybrids Orobelle and Bomby for ascorbic acid content, Indam Mamatha and Bachata for chlorophyll content and hybrids Bachata and Indam Mamatha for low capsaicin content offer promise.

Table 1. Mean performance of green bell pepper in relation to quality traits during winter-summer season, 2012-13

Genotypes/ traits	Ascorbic acid content (mg/100 g)	Capsaicin content (%)	Chlorophyll content (mg/100g)	Dry matter (%)
Indam Mamatha F_1 hybrid	91.83	0.056	13.30	6.38
Inspiration F_1 hybrid	91.26	0.099	11.02	5.77
Bachata F_1 hybrid	92.79	0.038	11.94	6.20
Orobelle F_1 hybrid	111.97	0.075	11.67	6.14
Indam Super Gold F_1 hybrid	98.28	0.117	10.90	6.50
Indian F_1 hybrid	103.47	0.107	11.84	6.07
Double Up F_1 hybrid	101.19	0.072	11.70	6.23
Natasha F_1 hybrid	92.71	0.067	12.00	5.63
Spinx (+) F_1 hybrid	83.13	0.113	11.40	6.03
Bomby F_1 hybrid	106.20	0.120	11.76	6.57
Indam Lakshmi F_1 hybrid	97.20	0.110	11.75	6.27
Indam Mahabharat F_1 hybrid	89.76	0.120	10.99	5.51
Paladin F_1 hybrid	104.83	0.120	10.60	6.35
Indra F_1 hybrid (check)	102.54	0.086	11.73	6.34
California Wonder* (check)	101.40	0.073	9.90	5.88
Range	83.13-111.97	0.038 -0.120	9.90-13.30	5.51-6.57
General mean	97.90	0.091	11.50	6.12
SE (m)±	0.938	0.003	0.360	0.529
CD (0.05)	2.717	0.010	0.560	NS
CV (%)	1.659	6.521	5.432	10.594

REFERENCES

[1] Bukasov SM. **1930**. The cultivated plants of Mexico, Guatemala and Columbia
[2] Anonymous. **2013a**. Food and Agriculture Organization of the United Nations *http://www.FAO stat.fao.org.com.* (10th October, **2014**).
[3] Anonymous. **2013b**. Indian Horticulture Database. National Horticulture Board, Ministry of Agriculture, Government of India, Gurgaon.
[4] Agarwal A, Gupta S and Ahmed Z. **2007**. *Acta Horticulturae* 756: 309-314.
[5] Ranganna S. **1979**. Manuals of Analysis of Fruits and Vegetable Products. Tata McGraw Hill Book Company, New Delhi.
[6] Bajaj KL. **1980**. *Journal of Association of Official Analytical Chemists* 63: 1314-1316.

[7] Jayaraman J. **1981**. In: *Laboratory manual in biochemistry*. Willay Eastwern Pvt. Ltd., New Delhi.
[8] Valiskova M and Belko I. **2004**. Evaluation of sweet pepper assortment. (*Capsicum annuum* L.) Capsicum and Eggplant Newsletter : 21-24
[9] Choudhary N, Pathania NK, Singh SP, Kumar P and Singh Y. **2011**. *Vegetable Science* 38: 218-220
[10] Cebula S. **1989**. *Folia Horticulturae* 2: 3-15.
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