

## Original Research Article

# Evaluation of Chilli (*Capsicum annum* L.) Genotypes for Quality Traits in Allahabad Agro-Climatic Conditions

R. Katheek Bharadwaza<sup>1\*</sup>, V. M. Prasad<sup>1</sup>, G. Narayana Swamy<sup>2</sup> and M. Adinarayana<sup>3</sup>

<sup>1</sup>Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology & Sciences, (Formerly Allahabad Agricultural Institute) Allahabad (U.P.), India

<sup>2</sup>Department of Horticulture, KVK, Nellore, ANGRAU (A.P.), India

<sup>3</sup>IIHR, Bangalore, Karnataka, India

\*Corresponding author

## ABSTRACT

A field study was carried out at the Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology & Sciences, Allahabad (U.P.) in Rabi season during 2012-2013 to evaluate the Chilli (*Capsicum annum* L.) genotypes in Allahabad agro-climatic conditions. The experiment was laid out in Randomized Block Design (RBD) with three replications, which included fifteen genotypes viz., 2012/CHIVAR-2, 2012/CHIVAR-3, 2012/CHIVAR-5, 2012/CHIVAR-8, 2011/CHIVAR-2, 2011/CHIVAR-4, 2011/CHIVAR-5, 2011/CHIVAR-6, 2011/CHIVAR-7, 2011/CHIVAR-8, 2011/CHIVAR-9, 2010/CHIVAR-1, 2010/CHIVAR-4, 2010/CHIVAR-5, KASHI-ANMOL. The chilli genotypes were transplanted with care in the field during the month of December 2012 at the spacing of 60 cm x 45 cm. Significant differences were observed among the genotypes for qualitative parameters. The genotype 2012/CHIVAR-2 was found significantly superior than all the genotypes under study, recorded the maximum Vitamin-C (164.92 mg 100 g<sup>-1</sup> fruit), 2011/CHIVAR-4 recorded maximum amount of Capsaicin (0.61 %) and 2011/CHIVAR-8 recorded maximum amount of Oleoresin (13.40 %)

### Keywords

Chilli, genotypes, evaluation, growth, yield, quality

## Introduction

Chilli or pepper (*Capsicum annum* L.) belongs to family Solanaceae, which is emerging as one of the commercial vegetable crops at the global level, and is probably most important vegetable after Tomato. Chilli finds its place in spice as well as condiments. Chilli fruits are rich sources of vitamin C, vitamin A and E (Singh, 2004). Pungency of chilli is due to a crystalline acrid volatile alkaloid called capsaicin, present in the placenta of fruit. It is also a good source of chilli oleoresin, which is the total flavour extract of dried

and ground chillies. The natural colour extracts of chilli are also finding their increased value in place of artificial colours in the food items. Majority of farmers are still growing local cultivars. Besides soil and climatic factors the cultivar itself is very important in respect of its performance regarding earliness, disease resistance and yield and qualitative characters. Many cultivars have been developed and recommended by various research institute and State Agricultural Universities but the adoptability and qualitative attributes of the

cultivars is not the same in all regions. So there is a pressing demand for a suitable variety in Allahabad climatic conditions. Hence, an experiment was conducted at Department of Horticulture, SHIATS, Allahabad, to evaluate chilli genotypes for quality attributes.

### **Materials and Methods**

The experimental material i.e. seed packets of all the 15 Chilli genotypes received from the Project Coordinator, AICRP (Vegetable Crops), IIVR, Varanasi, Uttar Pradesh (India), were sown during Rabi season of 2012. After 45 days of sowing, seedlings were transplanted in the field during the month of December 2012 in randomized block design with three replicates, at the spacing of 60 x 45 cm. The experimental plot was irrigated at fortnightly interval with canal water and was kept weed free. The crop was raised as per the recommended packaging practices suggested by Chadha, K.L. 2002. For recording field observations Qualitative parameters, five randomly chosen plants were tagged from each genotype in each replication were used. Green fruit yield data were recorded picking wise and calculated on hector basis. Capsaicin content (%) was determined by Folin-Dennis method. Oleoresin was extracted in a Soxhlet's apparatus using solvent acetone. Ascorbic acid content of fruits at red ripe stage was estimated by 2, 6-dichlorophenol indophenol dye method. The total soluble solids content was determined with the help of ERMA Hand Refractometer. Analysis of variance in respect of the various characters was done.

### **Results and Discussion**

The analysis of variance was conducted to test significance different among genotype studied. The performance of various

genotypes of chilli under Allahabad condition is presented in Table 1. The results revealed that differences due to various genotypes were highly significant for all the characters under study indicating considerable amount of variability among the genotypes tested.

The nutritive value of chilli is largely determined by the content of Ascorbic acid. The variation of ascorbic acid content was from 164.92 (2012/ CHIVAR-2) to 121.81 (2011/CH IVAR-4) mg 100 g<sup>-1</sup> fresh fruit weight. Such wide variation was also reported by Kumar *et al.*, 2003.

Capsaicin, the pungent principle of chilli was found to vary from 0.61 (2011/CHIVAR-4) to 0.23 (2011/CHIVA R-5) percent. This variation could probably be due to the presence of gene modifying factors for pungency and the ratio of placental tissue to seed and pericarp (Sreelathakumary, 2000).

The current investigation revealed considerable variation for Oleoresin from 13.40 (2011/CHIVAR-8) to 8.24 (2011/CHIVAR-6) per cent with an overall mean of 11.05 per cent. This was in agreement with the results obtained by Jyothi *et al.*, 2008.

From the present study, it was concluded that the performance for Qualitative characters like Ascorbic acid, Capsaicin and Oleoresin content of genotypes vary from genotype to genotype. The genotype 2012/CHIVAR-2 was found significantly superior than all the genotypes under study, recorded the maximum Vitamin-C (164.92 mg 100 g<sup>-1</sup> fruit), 2011/CHIVAR-4 recorded maximum amount of Capsaicin (0.61 %) and 2011/CHIVAR-8 recorded maximum amount of Oleoresin (13.40 %) in Allahabad agro-climatic conditions.

**Table.1** Mean performance of different genotypes in Allahabad agro-climatic conditions

Genotypes	Vitamin-C (mg 100g <sup>-1</sup> )	Capsaicin Content (%)	Oleoresin content (%)
2010/CHIVAR-1	154.33	0.29	9.95
2010/CHIVAR-4	127.14	0.38	8.73
2010/CHIVAR-5	130.25	0.59	12.81
2011/CHIVAR-2	147.06	0.53	12.46
2011/CHIVAR-4	121.81	0.61	13.03
2011/CHIVAR-5	135.10	0.23	9.52
2011/CHIVAR-6	144.63	0.35	8.24
2011/CHIVAR-7	138.47	0.26	10.11
2011/CHIVAR-8	160.25	0.56	13.40
2011/CHIVAR-9	132.82	0.40	10.82
2012/CHIVAR-2	164.92	0.45	11.75
2012/CHIVAR-3	157.42	0.51	12.16
2012/CHIVAR-5	123.98	0.49	10.30
2012/CHIVAR-8	140.28	0.31	11.45
KASI-ANMOL	151.19	0.43	11.05
S.E. (±)	0.646	0.006	0.045
C.D. (P=0.05)	1.871	0.019	0.130
C.V.	0.788	2.658	0.706

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