

SHORT COMMUNICATION

Studies on Variability in Chilli (*Capsicum* spp.) in Central Himalaya**Vandana Pandey, Tribhuwan Pant and Z Ahmed**

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There is rich variability in Chilli (*Capsicum* spp.). Defence Agricultural Research Laboratory, Pithoragarh has assembled and evaluated the variability available in *Capsicum* spp., with the objective to find out the promising genotypes on the basis of high yield, biochemical parameters and capsaicin contents. The genotypes which were found promising can be used in further breeding programme for improvement in various yield and nutritional parameters in *Capsicum* spp.

Key Words: *Capsicum* spp., Variability, Genotype, Capsaicin

The cultivated *Capsicum* spp. are herbaceous, frost resistance plants that in temperate areas are annual in growth pattern but in tropical areas may continue to grow and produce yield over several years (ratoon crop). *Capsicum* is a member of Solanaceae, includes many cultivated forms such as pungent peppers, paprika, mild pickle type and bell shaped, non pungent forms known as bell pepper or shimla mirch. At present five species of *Capsicum* are known to have been brought under cultivation (Smith *et al.*, 1987). They include *Capsicum annuum* L., *C. frutescens* L., *C. baccatum* L., *C. chinense* Jacquin and *C. pubescens* Ruiz and Paven. *Capsicum* is a good source of capsaicin and used in the manufacture of selected commercial products known for their pungency and colour (Andrews, 1984). There is great variability among size, shape, color and pungency of fruits of *Capsicum* spp., which can be exploited through conventional breeding (Pickersgill, 1989). Since critical assessment of nature and magnitude of variability is prerequisite for efficient breeding programme and provides an opportunity to identify promising lines with desirable yield and quality parameters. Identification of superior genotypes among relatively new ones becomes imperative for promoting production, productivity and quality of the produce (Mishra *et al.*, 2005). Such type of study was conducted at DARL, Pithoragarh during the year 2006-2007 for identification of promising genotypes

which can be used in further breeding programme.

Fifty genotypes of *Capsicum* were collected from different national, international and state agricultural universities to enrich the pedigree. Collected germplasm from IARI, New Delhi, IIHR, Bangalore, GBPUA&T, Pantnagar, IARI, Katrain, Gujrat Agricultural University, Kerala Agricultural University and Asian Vegetable Research & Development Center, Taiwan was sown in the nursery and transplanted in the field in three replications in randomized block design. Spacing within plants and rows was 60 cm x 60 cm. Morphological data such as corolla colour, corolla throat spots, anther colour, seed colour and flowers per node were recorded. Data were also recorded on quantitative characters viz, fruit length (cm), fruit width (cm), fruit number per plant and fruit yield per plant. Biochemical characterization for total soluble solids (TSS%), ascorbic acid (mg/100 g) and Capsaicinoid contents (SHU) was performed. T.S.S was studied with the help of Erma Hand Refractometer. Ascorbic acid determination in the fruit was done using Di nitro phenyl hydrazine (DNPH method) (Sadasivam and Balasubraminam, 1987). Capsaicinoid content was determined by high pressure liquid chromatography (HPLC method) (Estrada *et al.*, 1997). There was great variation in morphological characters among collected germplasm (Table 1).

Table 1. Morphological characters of collected *Capsicum* spp.

S.No.	<i>Capsicum</i> species	Corolla color	Corolla throat spots	Anther color	Seed color	Flowers per node
1	<i>Capsicum annuum</i>	White	None	Blue purple	Tan	1
2	<i>Capsicum frutescens</i>	Greenish white	None	Blue	Tan	1-3 or 5
3	<i>Capsicum baccatum</i>	White	Yellow	Yellow	Tan	1-2
4	<i>Capsicum chinense</i>	White to greenish-white	None	Blue	Tan	1-5
5	<i>Capsicum pubescence</i>	Purple	None	Purple	Black	1

Table 2. Yield attributing characters in different species of *Capsicum* spp.

Species	Characters	Fruit length (cm)	Fruit width (cm)	Fruit number/plant	Fruit yield plant (kg)
<i>C. annuum</i>	Minimum	6.2	5.3	10.0	0.400
	Maximum	17.3	25.5	58.0	2.000
	Mean	11.75	15.4	34.0	1.200
<i>C. frutescens</i>	Minimum	2.5	2.1	25.0	0.085
	Maximum	8.5	6.7	80.0	0.300
	Mean	5.5	4.4	52.5	0.192
<i>C. chinense</i>	Minimum	2.5	5.0	40.0	0.100
	Maximum	10.6	7.2	70.0	0.500
	Mean	6.5	6.1	55.0	0.300
<i>C. baccatum</i>	Minimum	3.7	4.0	30.0	0.310
	Maximum	11.3	10.3	50.0	0.425
	Mean	7.5	7.15	40.0	0.367
<i>C. pubescens</i>	Minimum	6.2	3.5	17.0	0.185
	Maximum	9.6	11.0	50.0	0.370
	Mean	7.9	7.3	33.5	0.278

Minimum and maximum values along with means, with respect to yield, yield attributing characters and biochemical characters are given in (Table 2 and 3). Data revealed that in *C. annuum* fruit yield per plant (kg) ranged from 0.400–2.00. The highest yield was recorded in CO-3837. The TSS % was highest in the fruits of red capsicum (8.14). PBC-280 exhibited highest ascorbic acid (112.0 mg/100 g). Maximum fruit length (cm) was recorded in CO-6763 (17.3). In *C. frutescens*, DARL-210 exhibited maximum number of fruits per plant (105) with highest capsaicinoid content (2,76,750 SHU) and TSS (7.92%). PBC-926 showed maximum ascorbic acid (129.85 mg/100g). In *C. chinense* CC-2 showed maximum TSS % (5.37) with ascorbic acid (99.20 mg/100g). Maximum capsaicinoid contents was exhibited by Tejpur chilli (2,54,896 SHU). In *C. baccatum* CO-4180 exhibited maximum TSS (6.20%) and ascorbic acid (50.92mg/100g). Genotype KT-14 showed maximum capsaicinoid (52250 SHU). In *C. pubescens* NBPGR-1 showed maximum TSS (7.28%), ascorbic acid (118.20mg/100g) and capsaicinoid content (1,08076 SHU). The genotypes which were found promising, represent a potential source for future development and can be used as donor parents for further breeding programme.

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Table 3. Bio-chemical characters in different species of *Capsicum*

Species	Characters	Total soluble solids %	Ascorbic acid (mg/100g)	Capsaicinoids SHU
<i>C. annuum</i>	Minimum	3.46	41.73	1602.00
	Maximum	8.14	112.00	14564.0
	Mean	5.80	76.86	8083.00
<i>C. frutescens</i>	Minimum	5.20	50.86	30445.00
	Maximum	7.92	129.85	2,76,750.00
	Mean	6.56	90.35	153597.50
<i>C. chinense</i>	Minimum	4.50	87.23	43500.00
	Maximum	6.25	99.20	2,54,896.00
	Mean	5.37	48.215	1,49,198.00
<i>C. baccatum</i>	Minimum	4.68	42.75	15,885.00
	Maximum	6.20	50.92	52,250.00
	Mean	5.44	46.83	34067.50
<i>C. pubescens</i>	Minimum	4.12	45.72	52,220.00
	Maximum	7.28	118.20	1,08076.00
	Mean	5.70	81.96	80148.00

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