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Biochemical evaluation of chilli (*Capsicum annuum* L) cultivars suitable for export

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Abstract

Chilli, an important spice of India is cultivated in all the states and Union territories of the country. Some varieties are famous for typical red colour and others are known for pungency. A study was conducted on biochemical constituents viz., oleoresin, capsanthin and capsaicin for two consecutive years viz; 2005-06 and 2006-07.Twenty three cultivars collected from the coordinated centres of All India Co-ordinated Vegetable Improvement Project from all over the country were used in this study. Among the cultivars studied, PC-7 and PC-6 from Pantnagar recorded the highest colour value of 50782 and 49456 EOA colour value respectively and the lowest colour value was recorded by DCL-352(19932 EOA colour value) . The highest oleoresin content was recorded by DCL 352 (13.82%) of IARI and the lowest was recorded by PC-7 (6.91%). The capsaicin content among the entries was in the range of 0.256 % (SKAU-C-101) to 0.528% (BC-40-2). From the above study, it was concluded that the cultivars viz; PC-7, PC-6 of Pantnagar and Sel 11 of Ludhiana had high colour value and similarly BC-40-2 of Bhubaneshwar had high pungency and suitable to catch high market price both in domestic and export market

Key words: *Capsicum annuum*, chilli, oleoresin, capsanthin, capsaicin

Abbreviations: EOA= Essential Oil Association

Chilli, an important spice of India is cultivated in all the states and union territories of the country. No country in the world has so much area and production as much as India. India posses many varieties with different quality factors. Relatively little information is available on the biochemical constituents of chilli cultivars. Therefore, the present study was aimed to generate information on the important biochemical constituents of improved chilli cultivars developed by different co-ordinated centres of All India Co-ordinated Vegetable Improvement Project.

Twenty three chilli cultivars viz. Sel 11, HS-HP-1111,HS-HP-154, PC-7,HDC-75,LCA 206, JCA 283, LCA 334,LCA 353, DCL-352, DCL 524,DSL-1,DSL-2,PC-6, Indra chilli, Ajeet-3, SKAU-C-101, CO-4, KCS 2013, BC-40-2, BC-25, ACS-2000-06 and F112-5-83 received from different Coordinated centres under All India Co-ordinated Vegetable Improvement Project were selected for the present investigation. Healthy dried fruits were used for bio chemical analysis. The experiment was conducted in a randomized block design with three replications for two consecutive years viz., 2005-06 and 2006-07. Oleoresin and EOA

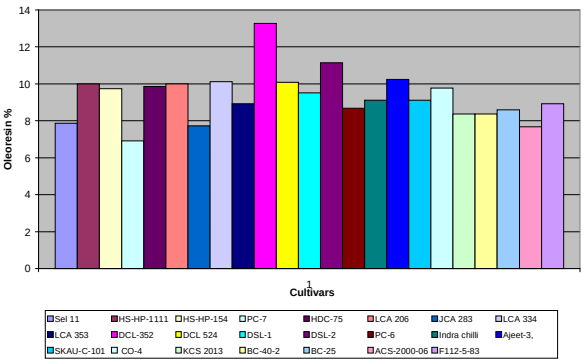

Fig. 1. Mean oleoresin content (%) of chilli cultivars

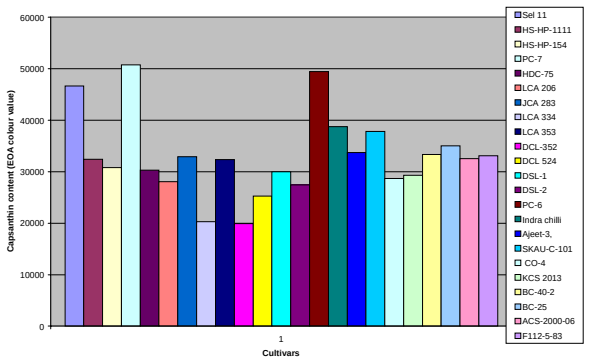

Fig. 2. Mean capsanthin content (EDA colour value) of chilli cultivars

colour value were estimated as per the procedure outlined by Roserbrooke *et al* (1968) and capsaicin by Bajaj and Gurudeep Kaur (1979).

The bio chemical constituents viz., oleoresin, capsanthin and capsaicin were estimated for all the cultivars for two consecutive years viz., 2005-06 and 2006-07 immediately after

Table 1. Contents of oleoresin, capsanthin and capsaicin of chilli cultivars (Mean values of two years viz., 2005-06 & 2006-07)

S. No.	Name of the variety	Source	Oleoresin (%)	Capsanthing (EOA colour value)	Capsaicin (%)
1.	Sel 11	Ludhiana	7.87	46665	0.317
2.	HS-HP-1111	Srinagar	10.0	32391	0.282
3.	HS-HP-154	Srinagar	9.75	30805	0.313
4.	PC-7	Pantnagar	6.91	50782	0.295
5.	HDC-75	Dharwad	9.87	30317	0.299
6.	LCA 206	Lam	10.0	28070	0.369
7.	JCA 283	Jabalpur	7.72	32910	0.354
8	LCA 334	Lam	10.12	20283	0.346
9	LCA 353	Lam	8.92	32340	0.323
10	DCL-352	IARI	13.28	19932	0.364
11	DCL 524	IARI	10.09	25300	0.320
12	DSL-1	Durga Seeds	9.52	29982	0.295
13	DSL-2	Durga Seeds	11.14	27420	0.338
14	PC-6	Pantnagar	8.69	49456	0.378
15	Indra chilli	Raipur	9.11	38760	0.412
16	Ajeet-3,	Ajeet Seeds	10.25	33748	0.414
17	SKAU-C-101	Srinagar	9.12	37850	0.256
18	CO-4	Coimbatore	9.77	28670	0.319
19	KCS 2013	Kalyanpur	8.37	29295	0.420
20	BC-40-2	Bhubaneshwar	8.38	33336	0.528
21	BC-25	Bhubaneshwar	8.59	35014	0.434
22	ACS-2000-06	Anand	7.68	32544	0.277
23	F112-5-83	IIVR	8.93	33092	0.280
		CD = (P=0.05)	2.072	11428.26	NS

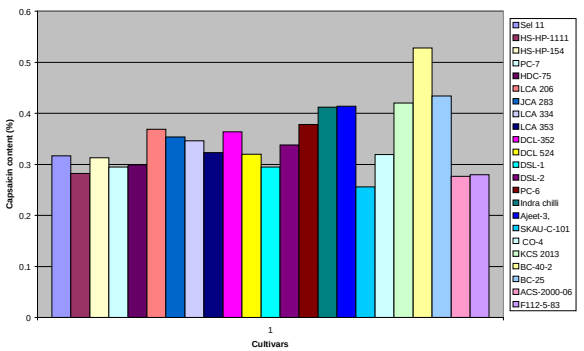

Fig. 3. Mean capsaicin content (%) of chilli cultivars

drying and the mean values were worked out and the results are presented in Table 1 and Figs 1, 2 and 3.

The results presented in Table. 1 and Fig. 1 revealed considerable variability among the cultivars with respect to oleoresin recovery. It varied from 6.91 to 13.82 per cent. Among the cultivars, DCL 352 of IARI recorded the highest oleoresin content with 13.82 per cent and was found significantly superior to all the other cultivars. The minimum oleoresin content of 6.91 per cent was recorded by PC-7 from Pantnagar. Similar variation in oleoresin recovery among the cultivars was reported by Pradeep Kumar (1990), Pruthi (1993) and Indira *et al* (1994).

Notable variability in colour value was recorded in the cultivars employed in the study. It was in the range of 19932 to 50782 EOA colour value (Table 1 &Fig.2). PC-7 and PC-6 from Pantnagar recorded the highest mean value 50782 and 49456 EOA units respectively and the lowest mean was recorded by DCL-352 (19932 EOA colour value). Similar variation in colour value among the chilli cultivars was reported by Shrivastava *et al* (1990).

The capsaicin content of different chilli cultivars in the present investigation was in the range of 0.256 to 0.528. (Table 1 & Fig.3). The values for capsaicin content obtained in the present investigation in line with the capsaicin content of Indian chillies as reported by Pankaj and Magar(1978). Though the difference in capsaicin content was not significant, however, the highest capsaicin content with 0.528 per cent was recorded by BC-40-2 of Bhubaneshwar. It was followed by BC-25 with 0.434 per cent and KCS-2013 with 0.420 per cent. The lowest capsaicin content with 0.256 per cent was recorded by SKAU-C-101 of Srinagar. The variation in capsaicin content among the cultivars could be attributed to genotype differences (Tirumalachar, 1967).

From the above study, it could be concluded that the cultivars viz., PC-7 and PC-6 of Pantnagar and Sel 11 of Ludhiana had high colour value and similarly BC-40-2 of Bhubaneshwar had high pungency and suitable to various market requirements.

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