



ISSN (E): 2277- 7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.03  
TPI 2021; 10(1): 109-116  
© 2020 TPI  
[www.thepharmajournal.com](http://www.thepharmajournal.com)  
Received: 28-10-2020  
Accepted: 08-12-2020

**Ashwini Pardeshi**  
Student, Department of Soil  
Science and Agricultural  
Chemistry, Dr. Balasaheb  
Sawant Konkani Krishi  
Vidyapeeth, Dapoli,  
Maharashtra, India

**Pooja Sawant**  
Assistant Professor, Department  
of Soil Science and Agricultural  
Chemistry, Dr. Balasaheb  
Sawant Konkani Krishi  
Vidyapeeth, Dapoli,  
Maharashtra, India

**PB Sanap**  
Vegetable Specialist, Central  
Experimentation Station,  
Wakawali, Dr. Balasaheb  
Sawant Konkani Krishi  
Vidyapeeth, Dapoli,  
Maharashtra, India

**SB Dodake**  
Head, Department of Soil  
Science and Agricultural  
Chemistry, Dr. Balasaheb  
Sawant Konkani Krishi  
Vidyapeeth, Dapoli,  
Maharashtra, India

**Rahi Risbud**  
Student, Department of Soil  
Science and Agricultural  
Chemistry, Dr. Balasaheb  
Sawant Konkani Krishi  
Vidyapeeth, Dapoli,  
Maharashtra, India

**Corresponding Author:**  
**Ashwini Pardeshi**  
Student, Department of Soil  
Science and Agricultural  
Chemistry, Dr. Balasaheb  
Sawant Konkani Krishi  
Vidyapeeth, Dapoli,  
Maharashtra, India

## Physical characteristics and nutrient composition of chilli (*Capsicum annum* L.) germplasm under Konkani condition

Ashwini Pardeshi, Pooja Sawant, PB Sanap, SB Dodake and Rahi Risbud

### Abstract

Physical characteristics *viz.*, fruit diameter, length, weight, colour and nutritional composition *viz.*, Moisture, Ascorbic acid, Total N, P, K, and Micronutrients *viz.*, Fe, Mn, Zn and Cu of hundred chilli germplasm were studied during *Kharif* season, 2018-2019 at Vegetative Improvement Scheme, Central Research Station, Wakawali, Dapoli. Among the hundred chilli germplasm, highest fruit diameter (1.2cm) was recorded in DPLC-15, Wakawali-20 and Konkani kirti of pure chilli germplasm and WKLC-11 and WKLC-14 of F<sub>5</sub> germplasm. WKLC-6 (9.4cm) of F<sub>5</sub> generation showed maximum fruit length, while maximum fruit weight was found in DPLC-15 (31.60 g) of pure chilli germplasm. Significant difference was observed in hundred chilli germplasm. Highest moisture percentage (93.58 %) was recorded in WKLC-1 of F<sub>2</sub> generation of chilli germplasm while Ascorbic acid was found to be maximum (196.06 mg 100 g<sup>-1</sup>) in WKLC-15 of F<sub>6</sub> generation of chilli germplasm. Highest nitrogen, phosphorous and potassium contents were found in WKLC-12 (1.75%), WKLC-2 (0.20%) and WKLC-10 (2.92%) of F<sub>2</sub> generation. Highest values for iron, zinc and copper content were found in WKLC-18 (23.41 mg kg<sup>-1</sup>), WKLC-6 (42.75 mg kg<sup>-1</sup>) and WKLC-3 (45.37 mg kg<sup>-1</sup>), respectively, of F<sub>2</sub> generation of chilli germplasm. Manganese content was found to be highest in Wakawali-19 (34.66 mg kg<sup>-1</sup>) of pure chilli germplasm. The correlation revealed that fruit diameter and fruit length had significant positive correlation with fruit weight. Moisture had positive and significant correlation with iron, zinc and manganese. Iron had positive and significant correlation with manganese. Manganese showed significant positive correlation with zinc and copper content.

**Keywords:** Chilli germplasm, physical characteristics, moisture, ascorbic acid, total N, P, K, micronutrients

### Introduction

Chilli (*Capsicum annum* L.) production in India is expanding more rapidly than the growth in population, giving boost to both export and domestic consumption. Chilli is an important commodity used as a vegetable, spice, medicinal herb, and ornamental plant by billions of people every day. It is also used as an ingredient in industrial products and which can be observed by the different fruit shapes, sizes, colors, aromas, textures. The diversity in its uses, forms and shapes brings complexity into its production and distribution systems (Farooqi *et al.*, 2003) [2]. Chillies used in flavoring foods are popular in the cuisines of many parts of the world as it adds the pungency, colour, the remarkable aroma. In view of the changing of food habits and health conscious's, food quality particularly perishables like fruits and vegetables is gaining importance since improved quality not only facilitates remunerative market price for the producer and also improves health of the consumer. Hence, the present study about chilli mainly focused to determine physical characteristics and nutritional composition of a number of chilli germplasm.

### Materials and Methods

The investigation was carried out during *Kharif* 2018- 19 at Vegetative Improvement Scheme, Central Research Station, Wakawali, Dapoli with 100 germplasm of chilli (*Capsicum annum* L.) in a randomized block design with three replications. Diameter of fruit was recorded from five selected plants by using vernier caliper. Length of fruit (cm) was recorded from five selected plants in the plot area at each picking time by using scale. The weight of fruit (g plant<sup>-1</sup>) was recorded from five selected plants in the plot area at each picking time and average was worked out. While the colour of fruits was recorded by Colour Flux Meter. Determination of moisture content (%) was done by oven dry method (AOAC, 1990) [1].

Ascorbic acid was estimated by 2,6-dichlorophenol endophenol dye method as described by Ranganna (1997) [14]. The total nitrogen content was determined by using Pelican make Distyl Em distillation unit (Tandon, 1993) [18]. Total phosphorous in the digested sample were estimated by using spectrophotometer as described by Tandon (1993) [18]. Total potassium in the digested sample were estimated by using flame photometer as described by Tandon (1993) [18]. Micronutrients i.e. Fe, Mn, Zn and Cu in the digested sample were estimated by using atomic absorption spectrophotometer (Mclaren and Crawford, 1950) [9]. The experimental data was analyzed statistically by the technique of analysis of variance

as applicable to randomized block design. The significance of treatment difference was tested by 'F' (Variance ratio) test. Critical difference (CD) at 5 per cent level of probability was worked out for comparison and statistical interpretation of the treatment means (Panse and Sukhatme, 1967) [10]. Observation were recorded on physical characteristics viz., fruit length (cm), fruit diameter (cm), fruit weight (g) and nutrient compositions viz., Moisture (%), Ascorbic acid (mg 100 g<sup>-1</sup>), Total N (%), P (%), K (%), Micronutrients (mg kg<sup>-1</sup>). Statistical analysis for calculation of correlation was worked out as per the procedure described by Gomez and Gomez (1983) [3].

**Table 1:** Details of Chilli germplasms used for the study

Sr. No.	Germplasm
1.	DPLC – 1
2.	DPLC – 2
3.	DPLC – 3
4.	DPLC – 4
5.	DPLC – 5
6.	DPLC – 6
7.	DPLC – 7
8.	DPLC – 8
9.	DPLC – 9
10.	DPLC – 10
11.	DPLC – 11
12.	DPLC – 12
13.	DPLC – 13
14.	DPLC – 14
15.	DPLC – 15
16.	Jwala
17.	Jayanti
18.	Pb. Gucchedar
19.	BC – 24
20.	BC – 28
21.	Konkan Kirti
22.	Sangam
23.	Wakawali-13
24.	Wakawali-19
25.	Wakawali-20
26.	ACS – 9818
27.	R.H.R. – 16 – 5
28.	R.H.R. – 57
29.	Pant-C3
30.	P. Tejas
31.	LCA-206
32.	LCA-283
	<b>F<sub>2</sub> Generation</b>
33.	WKLC – 1
34.	WKLC – 2
35.	WKLC – 3
36.	WKLC – 4
37.	WKLC – 5
38.	WKLC – 6
39.	WKLC – 7
40.	WKLC – 8
41.	WKLC – 9
42.	WKLC – 10
43.	WKLC – 11
44.	WKLC – 12
45.	WKLC – 13
46.	WKLC – 14
47.	WKLC – 15
48.	WKLC – 16
49.	WKLC – 17
50.	WKLC – 18
51.	WKLC – 19

52.	WKLC – 20
53.	WKLC – 21
54.	WKLC – 22
55.	WKLC – 23
56.	WKLC – 24
57.	WKLC – 25
58.	WKLC – 26
59.	WKLC – 27
60.	WKLC – 28
61.	WKLC – 29
6.	WKLC – 30
63.	WKLC – 31
64.	WKLC – 32
65.	WKLC – 33
66.	WKLC – 34
<b>F<sub>5</sub> Generation</b>	
67.	WKLC – 1
68.	WKLC – 2
69.	WKLC – 3
70.	WKLC – 4
71.	WKLC – 5
72.	WKLC – 6
73.	WKLC – 7
74.	WKLC – 8
75.	WKLC – 9
76.	WKLC – 10
77.	WKLC – 11
78.	WKLC – 12
79.	WKLC – 13
80.	WKLC – 14
81.	WKLC – 15
82.	WKLC – 16
83.	WKLC – 17
<b>F<sub>6</sub> Generation</b>	
84.	WKLC – 1
85.	WKLC – 2
86.	WKLC – 3
87.	WKLC – 4
88.	WKLC – 5
89.	WKLC – 6
90.	WKLC – 7
91.	WKLC – 8
92.	WKLC – 9
93.	WKLC – 10
94.	WKLC – 11
95.	WKLC – 12
96.	WKLC – 13
97.	WKLC – 14
98.	WKLC – 15
99.	WKLC – 16
100.	WKLC – 17

### Result and Discussion

Analysis of variance revealed highly significant difference among the germplasm studied (table 2, 3, 4, 5, 6, 7, 8 and 9). From the table, it was evident that significant variation were observed in all the germplasm studied. The physical properties like diameter, length, weight and colour of different chilli germplasm are important for processing, storage and handling of chilli fruits. The highest fruit diameter (1.2 cm in DPLC-15, Wakawali-20 and Konkan kirti of pure chilli germplasm and WKLC-11 and WKLC-14 of F<sub>5</sub> germplasm), fruit length (9.4 cm in WKLC-6 of F<sub>5</sub> generation), fruit weight (31.60 gm in DPLC-15 of pure chilli germplasm) and various colours were found as light green, dark green at matured stage and light red and dark red at ripe stage among the hundred chilli germplasm. The fruit diameter values agree

with the values reported by Samsangheile and Kanaujia (2014) and Pawar *et al.* (2018) <sup>[12]</sup>. However, highest fruit length of 14.1 cm has been reported by Ullah *et al.* (2008) <sup>[19]</sup>. Average fruit weight (1.57 to 3.7 g) and fruit colour of chilli has been reported by Pawar *et al.* (2018) <sup>[12]</sup>.

While wide variation observed in nutritional composition viz., moisture (94% in WKLC-1 of F<sub>2</sub> generation), Ascorbic acid (196.06 mg 100 g<sup>-1</sup> in WKLC-15 of F<sub>6</sub> generation). Highest N, P and K of chilli fruit found in WKLC-12 (1.75%), WKLC-2 (0.20%) and WKLC-10 (2.92%) of F<sub>2</sub> generation, respectively. Highest values for iron, zinc and copper content were found in WKLC-18 (23.41 mg kg<sup>-1</sup>), WKLC-6 (42.75 mg kg<sup>-1</sup>) and WKLC-3 (45.37 mg kg<sup>-1</sup>), respectively, of F<sub>2</sub> generation of chilli germplasm. Manganese content was found to be highest in Wakawali-19 (34.66 mg kg<sup>-1</sup>) of pure chilli

germplasm. Khyadagi *et al.* (2012) [7] reported that the moisture percentage ranged from 71.35 to 91.15 and 66.44 to 80.57 at green and ripe stages of chilli cultivars and found a decrease in the moisture percentage with increase in maturity stage. Similar are the findings (177.60 mg 100 g<sup>-1</sup> of ascorbic acid) of Pariari and Khan (2013) [11]. However, Kapur *et al.* (2012) [6] have reported lower values (49 mg 100 g<sup>-1</sup>) of ascorbic acid in fresh chilli fruits. Malik *et al.* (2011) [8] have reported the highest nitrogen and phosphorous content of 4.38 and 1.68% in chilli with the application of organic manures and inorganic fertilizers. The findings of Kapse *et al.* (2016) [5] who have reported the highest potassium content of 2.85 %.

The fruit weight had significant positive correlation with fruit diameter ( $r= 0.321^{**}$ ) and fruit length ( $r= 0.331^{**}$ ). Similar are the findings of Shweta *et al.* (2018) [17]. Fruit length had negative and significant correlation with copper content ( $r= -0.266^{**}$ ). Moisture had positive and significant correlation with zinc ( $r= 0.218^{*}$ ) at 1% level. Ascorbic acid had negative and significant correlation with moisture percentage ( $r= -0.267^{**}$ ). Moisture had significant positive correlation with iron ( $r= 0.343^{**}$ ) and manganese ( $r= 0.276^{**}$ ). Manganese had significant positive correlation with iron content ( $r= 0.363^{**}$ ). Zinc ( $r= 0.384^{**}$ ) and copper ( $r= 0.244^{*}$ ) showed significant positive correlation with manganese content.

**Table 2:** Physical characteristics of pure chilli germplasm

Pure germplasm	Fruit diameter (cm)	Fruit length (cm)	Fruit weight (g)	Fruit colour	
				Matured stage	Ripe stage
DPLC-1	1.0	5.5	9.11	Dark Green	Dark Red
DPLC-2	1.1	3.7	11.35	Dark Green	Dark Red
DPLC-3	1.1	5.5	14.37	Light Green	Light Red
DPLC-4	1.0	6.6	22.82	Light Green	Dark Red
DPLC-5	1.2	6.2	23.21	Dark Green	Light Red
DPLC-6	1.1	5.8	14.23	Dark Green	Dark Red
DPLC-7	0.9	7.3	11.04	Dark Green	Light Red
DPLC-8	1.0	7.2	9.50	Dark Green	Dark Red
DPLC-9	1.0	3.0	10.03	Dark Green	Dark Red
DPLC-10	1.0	8.5	25.39	Light Green	Dark Red
DPLC-11	0.8	9.3	12.51	Dark Green	Light Red
DPLC-12	1.0	8.5	16.73	Light Green	Light Red
DPLC-13	1.1	6.3	23.95	Dark Green	Dark Red
DPLC-14	1.0	8.0	23.41	Light Green	Light Red
DPLC-15	1.0	7.4	31.60	Light Green	Dark Red
Jwala	0.8	7.4	15.15	Light Green	Dark Red
Jayanti	0.9	7.1	18.62	Dark Green	Light Red
Pb. Gucchedar	1.0	4.4	14.27	Light Green	Light Red
BC-24	1.0	7.1	16.39	Light Green	Light Red
BC-28	1.1	8.3	24.16	Dark Green	Dark Red
Konkan Kirti	1.2	4.5	24.07	Dark Green	Dark Red
Sangam	0.8	7.5	11.54	Light Green	Dark Red
Wakawali-13	1.0	6.3	16.84	Dark Green	Dark Red
Wakawali-19	1.0	6.3	20.49	Light Green	Light Red
Wakawali-20	1.2	6.7	18.68	Dark Green	Dark Red
ACS-9818	0.9	6.7	14.63	Light Green	Dark Red
RHR-16-5	1.1	6.6	15.96	Light Green	Light Red
RHR-57	1.0	6.5	14.55	Dark Green	Light Red
Pant-C3	1.0	6.6	17.56	Light Green	Dark Red
P. Tejas	1.0	6.1	14.45	Light Green	Light Red
LCA-206	1.0	4.2	9.32	Light Green	Dark Red
LCA-283	1.0	5.0	17.39	Light Green	Dark Red
SE ±	0.007	0.021	0.030		
CD (P=0.05)	0.020	0.059	0.086		

**Table 3:** Physical characteristics of F<sub>2</sub> generation of chilli germplasm

F <sub>2</sub> generation	Fruit diameter (cm)	Fruit length (cm)	Fruit weight (g)	Fruit colour	
				Matured stage	Ripe stage
WKLC-1	1.0	6.3	8.76	Light Green	Light red
WKLC-2	1.0	5.3	12.42	Light Green	Dark Red
WKLC-3	0.9	4.5	11.92	Light Green	Light Red
WKLC-4	0.8	4.2	8.47	Dark Green	Light Red
WKLC-5	1.0	5.3	13.31	Light Green	Light Red
WKLC-6	1.0	4.4	12.45	Light Green	Light Red
WKLC-7	0.9	5.5	13.21	Dark Green	Dark Red
WKLC-8	1.0	3.8	11.38	Light Green	Light Red
WKLC-9	0.8	4.6	17.13	Light Green	Dark Red
WKLC-10	1.1	5.2	18.39	Dark Green	Light Red
WKLC-11	0.9	7.4	13.28	Dark Green	Light Red
WKLC-12	0.9	6.3	11.86	Dark Green	Dark Red

WKLC-13	0.8	6.2	11.01	Dark Green	Dark Red
WKLC-14	0.8	6.5	13.81	Dark Green	Dark Red
WKLC-15	1.1	7.5	17.40	Dark Green	Light Red
WKLC-16	0.9	6.3	15.72	Light Green	Light Red
WKLC-17	0.9	5.1	10.72	Light Green	Light Red
WKLC-18	0.9	4.0	19.84	Light Green	Dark Red
WKLC-19	0.9	5.7	17.10	Dark Green	Light Red
WKLC-20	1.1	5.9	15.38	Dark Green	Dark Red
WKLC-21	1.0	6.3	10.50	Light Green	Dark Red
WKLC-22	1.0	6.1	14.30	Dark Green	Light Red
WKLC-23	0.9	4.6	13.97	Light Green	Dark Red
WKLC-24	0.9	6.8	22.80	Dark Green	Dark Red
WKLC-25	0.9	4.7	14.50	Light Green	Dark Red
WKLC-26	1.0	5.3	21.73	Light Green	Dark Red
WKLC-27	1.0	8.3	14.02	Light Green	Dark Red
WKLC-28	0.8	6.4	17.28	Light Green	Light Red
WKLC-29	0.8	7.6	11.99	Dark Green	Dark Red
WKLC-30	0.8	7.9	14.61	Light Green	Dark Red
WKLC-31	0.8	6.5	9.50	Dark Green	Light Red
WKLC-32	0.8	5.5	15.20	Light Green	Light Red
WKLC-33	0.9	5.4	11.71	Light Green	Light Red
WKLC-34	1.0	7.3	9.96	Dark Green	Dark Red
SE $\pm$	0.006	0.007	0.058		
CD (P=0.05)	0.017	0.021	0.164		

**Table 4:** Physical characteristics of F<sub>5</sub> generation of Chilli germplasm

F <sub>5</sub> generation	Fruit diameter (cm)	Fruit length (cm)	Fruit weight (g)	Fruit colour	
				Matured stage	Ripe stage
WKLC-1	1.0	7.3	17.31	Light Green	Light red
WKLC-2	1.0	6.5	20.85	Light Green	Light Red
WKLC-3	0.9	7.6	9.83	Dark Green	Dark Red
WKLC-4	0.8	5.6	12.71	Dark Green	Dark Red
WKLC-5	0.8	6.7	13.05	Light Green	Light Red
WKLC-6	0.9	9.4	25.43	Light Green	Light Red
WKLC-7	0.7	7.3	11.47	Dark Green	Dark Red
WKLC-8	1.0	6.1	18.40	Light Green	Light Red
WKLC-9	1.0	6.4	13.08	Light Green	Light Red
WKLC-10	1.0	5.1	9.15	Light Green	Light Red
WKLC-11	1.2	5.7	16.26	Dark Green	Dark Red
WKLC-12	1.1	8.2	22.60	Dark Green	Dark Red
WKLC-13	1.0	7.5	16.48	Dark Green	Dark Red
WKLC-14	1.2	4.4	13.44	Light Green	Light Red
WKLC-15	1.0	5.3	11.33	Dark Green	Dark Red
WKLC-16	0.9	4.6	13.57	Dark Green	Dark Red
WKLC-17	1.0	5.7	19.32	Light Green	Light Red
SE $\pm$	0.009	0.011	0.061		
CD (P=0.05)	0.027	0.031	0.174		

**Table 5:** Physical characteristics of F<sub>6</sub> generation of Chilli germplasm

F <sub>6</sub> generation	Fruit diameter (cm)	Fruit length (cm)	Fruit weight (g)	Fruit colour	
				Matured stage	Ripe stage
WKLC-1	1.1	5.3	9.08	Light Green	Light Red
WKLC-2	0.8	6.2	12.89	Dark Green	Dark Red
WKLC-3	1.0	7.4	14.47	Light Green	Light Red
WKLC-4	0.8	6.3	16.53	Light Green	Light Red
WKLC-5	1.1	7.6	16.48	Light Green	Light Red
WKLC-6	0.9	6.1	11.78	Dark Green	Dark Red
WKLC-7	1.1	6.2	12.14	Dark Green	Dark Red
WKLC-8	1.0	8.3	18.49	Light Green	Light Red
WKLC-9	1.0	5.7	15.51	Light Green	Light Red
WKLC-10	1.1	6.0	14.13	Light Green	Light Red
WKLC-11	1.0	6.2	14.06	Dark Green	Dark Red
WKLC-12	1.1	7.0	19.15	Dark Green	Dark Red
WKLC-13	1.1	8.4	17.62	Light Green	Light Red
WKLC-14	1.1	6.3	25.10	Light Green	Light Red
WKLC-15	0.9	4.9	15.38	Dark Green	Dark Red
WKLC-16	1.1	7.2	20.51	Light Green	Light Red

WKLC-17	1.1	4.8	14.73	Dark Green	Dark Red
SE $\pm$	0.007	0.009	0.061		
CD (P=0.05)	0.021	0.025	0.175		

**Table 6:** Nutrient composition of pure Chilli germplasm

Pure germplasm	Moisture (%)	Ascorbic acid (mg100 g <sup>-1</sup> )	Total nitrogen %	Total phosphorous %	Total potassium %	Fe (mg kg <sup>-1</sup> )	Mn (mg kg <sup>-1</sup> )	Zn (mg kg <sup>-1</sup> )	Cu (mg kg <sup>-1</sup> )
DPLC-1	84.50	44.83	1.08	0.14	1.91	9.52	12.30	14.50	29.56
DPLC-2	83.57	83.77	1.58	0.17	2.39	10.51	15.69	18.74	32.59
DPLC-3	82.65	72.82	1.27	0.18	2.23	5.67	18.82	14.42	33.31
DPLC-4	78.06	71.11	1.46	0.15	2.24	10.30	22.69	20.41	30.52
DPLC-5	74.42	114.19	1.35	0.16	1.36	6.38	14.45	27.15	25.71
DPLC-6	67.65	74.97	1.17	0.17	1.85	7.42	15.54	14.77	37.48
DPLC-7	82.38	65.97	1.07	0.13	1.05	6.79	13.36	14.58	31.23
DPLC-8	84.76	72.01	0.83	0.16	2.77	9.46	15.52	16.82	41.22
DPLC-9	71.94	174.98	0.76	0.13	2.74	7.44	18.76	20.21	35.25
DPLC-10	81.58	61.09	1.42	0.15	1.67	7.41	13.42	21.41	28.61
DPLC-11	85.44	52.68	0.97	0.17	2.84	7.41	16.54	21.74	24.19
DPLC-12	82.95	56.77	1.05	0.15	1.86	8.47	13.67	15.80	27.41
DPLC-13	77.71	59.97	1.15	0.17	1.84	7.55	15.64	16.80	29.55
DPLC-14	82.20	70.48	1.09	0.14	2.85	8.63	17.75	17.60	31.22
DPLC-15	87.23	43.12	0.95	0.17	1.75	6.31	11.44	15.77	29.34
Jwala	61.81	137.10	1.36	0.14	1.81	6.36	15.24	16.39	35.62
Jayanti	79.84	73.03	1.27	0.12	1.31	8.46	15.87	19.63	32.44
Pb. Gucchedar	82.58	63.99	1.35	0.14	1.62	7.34	17.17	15.42	36.56
BC-24	85.08	143.86	1.46	0.16	1.43	9.48	16.86	17.71	30.59
BC-28	80.52	167.91	1.06	0.15	1.74	10.56	17.44	18.75	32.54
Konkan Kirti	76.80	72.12	1.07	0.14	2.14	9.32	20.89	23.28	42.52
Sangam	78.47	70.02	1.14	0.15	2.09	9.32	14.33	14.53	33.66
Wakawali-13	68.48	134.17	1.09	0.16	2.35	9.24	17.91	18.69	31.79
Wakawali-19	90.16	42.31	0.93	0.15	2.15	13.60	34.66	31.39	39.48
Wakawali-20	85.15	36.90	0.87	0.13	1.66	8.46	16.62	17.67	38.53
ACS-9818	78.70	131.21	1.26	0.17	2.20	6.47	14.71	25.83	33.73
RHR-16-5	85.11	113.70	1.34	0.14	1.56	6.36	15.64	16.56	34.57
RHR-57	83.87	82.84	1.51	0.17	1.42	9.66	17.64	14.20	34.20
Pant-C3	83.57	85.89	1.21	0.13	2.22	9.74	14.37	11.40	39.65
P. Tejas	77.36	111.26	1.15	0.14	2.52	6.41	15.58	17.62	36.24
LCA-206	81.76	177.59	0.91	0.15	1.67	7.29	13.57	16.28	38.22
LCA-283	84.37	122.07	1.32	0.16	2.62	8.53	18.84	19.36	40.61
SE $\pm$	0.015	0.028	0.011	0.004	0.013	0.008	0.003	0.004	0.005
CD (P=0.05)	0.043	0.078	0.032	0.010	0.037	0.023	0.008	0.012	0.015

**Table 7:** Nutrient composition of F<sub>2</sub> generation of Chilli germplasm

F <sub>2</sub> generation	Moisture (%)	Ascorbic acid (mg 100 g <sup>-1</sup> )	Total nitrogen %	Total phosphorous %	Total potassium %	Fe (mg kg <sup>-1</sup> )	Mn (mg kg <sup>-1</sup> )	Zn (mg kg <sup>-1</sup> )	Cu (mg kg <sup>-1</sup> )
WKLC-1	93.58	67.76	1.13	0.14	2.50	9.19	20.16	20.78	38.18
WKLC-2	84.01	96.31	0.81	0.20	2.87	15.32	21.64	22.19	34.18
WKLC-3	87.73	89.02	1.50	0.14	0.86	11.23	29.86	21.79	45.37
WKLC-4	85.84	63.04	1.48	0.15	2.53	7.60	24.19	22.38	41.52
WKLC-5	86.48	133.33	1.22	0.17	2.18	13.56	21.15	42.21	38.71
WKLC-6	88.22	64.96	1.36	0.16	2.06	10.77	21.79	42.75	36.26
WKLC-7	87.11	78.92	1.38	0.17	0.55	12.33	15.83	16.30	40.62
WKLC-8	87.54	52.01	1.04	0.13	1.63	11.41	17.60	22.00	41.29
WKLC-9	82.32	88.46	1.54	0.14	2.74	10.76	18.81	21.47	38.56
WKLC-10	87.68	109.61	1.26	0.16	2.92	15.68	20.26	27.97	33.70
WKLC-11	83.26	140.78	1.34	0.17	2.91	18.32	18.76	23.67	33.48
WKLC-12	82.65	130.32	1.75	0.13	1.43	13.21	16.66	16.57	35.18
WKLC-13	85.73	82.03	1.36	0.14	2.18	11.58	12.35	18.86	37.61
WKLC-14	87.61	54.10	1.11	0.15	2.44	12.54	17.77	31.96	33.90
WKLC-15	86.18	48.10	1.16	0.16	2.28	16.35	17.70	19.13	39.73
WKLC-16	84.45	161.55	1.29	0.17	2.67	12.68	23.82	21.96	41.58
WKLC-17	86.10	60.25	0.94	0.15	1.18	11.66	17.58	20.86	32.93
WKLC-18	81.81	103.32	1.35	0.14	2.50	23.41	18.13	20.59	38.51
WKLC-19	87.00	158.06	0.72	0.17	2.71	12.40	19.26	21.62	32.52
WKLC-20	85.96	175.67	1.40	0.16	1.14	8.20	16.43	23.03	42.53
WKLC-21	86.14	116.04	1.51	0.14	2.75	17.18	22.46	23.02	31.92
WKLC-22	87.57	85.52	1.57	0.15	1.31	12.57	20.56	21.73	36.20

WKLC-23	83.40	78.82	1.13	0.16	1.23	12.46	19.25	20.39	38.52
WKLC-24	86.79	68.38	1.23	0.17	2.04	10.55	15.22	21.23	33.92
WKLC-25	88.35	78.91	1.26	0.15	1.31	14.25	34.46	23.49	34.77
WKLC-26	84.32	85.32	1.30	0.16	2.72	11.66	20.87	21.04	39.72
WKLC-27	87.08	185.36	1.15	0.15	2.25	18.31	24.62	22.65	35.91
WKLC-28	86.37	60.10	1.05	0.13	1.40	11.51	17.61	21.59	32.62
WKLC-29	78.43	109.49	0.85	0.16	2.13	8.35	19.61	17.88	42.92
WKLC-30	84.52	140.88	1.28	0.17	1.93	8.50	16.68	33.40	40.70
WKLC-31	76.54	137.47	1.20	0.15	1.43	10.83	20.34	23.27	36.83
WKLC-32	87.17	79.07	1.02	0.18	1.63	10.65	14.38	19.36	33.66
WKLC-33	85.49	92.30	0.81	0.16	2.13	8.60	16.81	19.82	38.72
WKLC-34	90.09	103.68	1.46	0.14	1.24	11.19	18.23	24.29	39.23
SE ±	0.013	0.037	0.011	0.004	0.014	0.004	0.009	0.038	0.008
CD (P=0.05)	0.036	0.104	0.030	0.010	0.040	0.012	0.025	0.108	0.023

**Table 8:** Nutrient composition of F<sub>5</sub> generation of Chilli germplasm

F <sub>5</sub> Generation	Moisture (%)	Ascorbic acid (mg 100 g <sup>-1</sup> )	Total nitrogen %	Total phosphorous %	Total potassium %	Fe (mg kg <sup>-1</sup> )	Mn (mg kg <sup>-1</sup> )	Zn (mg kg <sup>-1</sup> )	Cu (mg kg <sup>-1</sup> )
WKLC-1	84.68	68.80	1.02	0.15	1.85	13.70	18.63	18.26	35.59
WKLC-2	85.93	58.31	0.99	0.14	1.10	14.12	18.75	32.99	37.50
WKLC-3	86.85	44.88	1.31	0.15	2.44	15.26	23.43	22.14	34.30
WKLC-4	92.67	65.66	1.17	0.16	2.67	9.47	19.75	20.72	33.84
WKLC-5	86.59	79.25	1.40	0.15	2.47	9.43	18.92	23.48	36.66
WKLC-6	87.21	60.95	1.25	0.16	1.70	8.74	18.44	18.72	40.44
WKLC-7	87.13	57.90	1.03	0.17	1.36	8.45	16.40	15.57	42.51
WKLC-8	86.80	133.17	1.09	0.16	1.51	9.33	21.22	19.89	37.35
WKLC-9	86.63	79.06	0.99	0.19	2.41	8.56	16.40	19.01	33.64
WKLC-10	87.27	120.06	1.15	0.14	1.78	8.64	20.45	20.99	39.62
WKLC-11	82.26	155.39	1.08	0.16	2.28	7.47	24.61	24.16	36.56
WKLC-12	84.39	62.86	0.90	0.17	1.71	6.80	22.62	22.96	38.56
WKLC-13	82.12	146.26	1.29	0.13	1.95	6.27	15.23	17.72	35.47
WKLC-14	81.59	60.72	0.97	0.16	1.20	8.18	21.21	18.65	39.77
WKLC-15	82.44	81.03	1.23	0.15	2.56	6.45	15.26	16.21	40.85
WKLC-16	80.87	91.81	1.47	0.14	1.38	9.31	17.17	17.74	38.89
WKLC-17	83.90	96.02	0.97	0.17	1.27	8.83	17.84	19.27	37.57
SE ±	0.024	0.058	0.009	0.004	0.023	0.130	0.003	0.054	0.010
CD (P=0.05)	0.070	0.167	0.027	0.012	0.066	0.374	0.009	0.155	0.028

**Table 9:** Nutrient composition of F<sub>6</sub> generation of Chilli germplasm

F <sub>6</sub> Generation	Moisture (%)	Ascorbic acid (mg 100g <sup>-1</sup> )	Total nitrogen %	Total phosphorous %	Total potassium %	Fe (mg kg <sup>-1</sup> )	Mn (mg kg <sup>-1</sup> )	Zn (mg kg <sup>-1</sup> )	Cu (mg kg <sup>-1</sup> )
WKLC-1	86.92	60.59	0.97	0.15	2.15	8.12	18.28	13.84	33.60
WKLC-2	83.14	56.79	0.55	0.13	2.25	13.13	16.67	14.73	30.27
WKLC-3	86.40	70.39	1.16	0.18	1.41	12.40	14.52	12.34	38.10
WKLC-4	82.53	76.02	1.21	0.15	1.60	13.33	8.46	15.12	37.29
WKLC-5	85.34	130.05	1.45	0.14	2.56	12.38	17.23	19.55	41.33
WKLC-6	85.86	105.30	1.24	0.12	1.56	15.63	16.32	21.95	32.22
WKLC-7	81.04	82.76	0.96	0.14	1.39	10.28	15.17	18.55	26.64
WKLC-8	84.91	67.39	1.19	0.17	2.66	7.82	16.28	22.23	31.43
WKLC-9	87.76	56.38	1.00	0.15	1.26	20.52	20.33	18.17	29.30
WKLC-10	86.52	169.05	1.12	0.16	1.33	16.67	33.34	20.82	33.62
WKLC-11	88.29	66.71	0.97	0.17	1.11	13.30	20.64	21.82	38.52
WKLC-12	86.75	76.47	0.67	0.14	1.30	17.72	18.83	17.10	32.44
WKLC-13	87.25	94.70	0.76	0.13	1.74	15.55	27.52	18.60	36.43
WKLC-14	85.96	87.75	0.84	0.16	1.44	10.24	17.35	27.05	36.20
WKLC-15	79.60	196.06	1.23	0.13	2.30	12.24	15.83	12.90	33.44
WKLC-16	88.42	86.62	1.42	0.14	2.32	9.54	20.89	16.82	31.67
WKLC-17	89.58	109.65	0.85	0.15	1.53	13.69	15.81	15.59	35.87
SE ±	0.029	0.038	0.020	0.004	0.009	0.008	0.048	0.055	0.005
CD (P=0.05)	0.083	0.111	0.057	0.011	0.025	0.022	0.137	0.157	0.016

**Table 10:** Correlation in between physical characteristics and nutrient composition of Chilli germplasm with each other

Nutrient composition	Physical characteristics											
	1	2	3	4	5	6	7	8	9	10	11	12
1	1.000											
2	-0.081	1.000										
3	0.321**	0.331**	1.000									
4	-0.030	0.029	-0.095	1.000								
5	0.067	-0.094	-0.108	-0.267*	1.000							
6	-0.118	-0.060	-0.048	-0.048	0.142	1.000						
7	0.035	0.065	0.097	0.081	-0.016	-0.088	1.000					
8	-0.079	0.022	-0.044	-0.065	0.108	-0.001	0.132	1.000				
9	-0.060	-0.070	-0.057	0.343**	0.062	-0.024	-0.082	0.020	1.000			
10	0.128	-0.147	-0.039	0.276**	0.099	0.003	0.022	0.037	0.363**	1.000		
11	-0.018	-0.089	0.053	0.218*	0.075	0.090	0.150	0.107	0.194	0.384**	1.000	
12	-0.073	-0.266**	-0.188	0.140	0.105	0.100	0.005	-0.064	0.010	0.244*	0.117	1.000

1. Fruit diameter, 2. Fruit length, 3. Fruit weight, 4. Moisture, 5. Ascorbic acid, 6. Total N, 7. Total P, 8. Total K, 9. Fe, 10. Mn, 11. Zn, 12. Cu  
Critical r value = 0.195 at 5 percent and 0.254 at 1 percent, \* and \*\* indicate significant at 5 and 1 percent probability level, respectively.

### Conclusion

From above study, it can be indicated that DPLC-5, Konkani Kirti, Wakawali-20 of pure chilli germplasm and WKLC-11 and WKLC-14 of F<sub>5</sub> generation of chilli germplasm had the highest diameter, WKLC-6 of F<sub>5</sub> generation of chilli germplasm had the highest length and DPLC-15 of pure chilli germplasm had the highest weight among the hundred chilli germplasm studied. The hundred chilli germplasm varieties showed varying nutrient composition. Ascorbic acid was found to be maximum in WKLC-15 of F<sub>6</sub> generation of chilli germplasm. WKLC-12, WKLC-2 and WKLC-10 of F<sub>2</sub> generation had the highest nitrogen, phosphorous and potassium content.

### References

- Anonymous. Official methods of analysis of Association of Official Analytical Chemists 1990;2.
- Farooqi AA, Srinivasappa KN, Sreeramu BS. Tropical spice crops. Indian Institute of Plantation Management. Bangalore 2003.
- Gomez KA, Gomez AA. Statistical Procedure for Agricultural Research 2<sup>nd</sup> edition. John Wilney and sons. New York 1983.
- Janaki ML, Naram Naidu C, Venkata Ramana, Paratpara Rao M. Selection of promising genotypes for qualitative traits in *Chilli Capsicum annum L.* Plant Archives 2015;15(1):441-446.
- Kapse. Effect of different sources of organic manures and their combination on yield and nutrient uptake by chilli (*Capsicum annum L.*) in lateritic soil of konkan. M. Sc. (Agri.) Thesis submitted to Dr. B. S. K. K. V., Dapoli. India (M. S) 2016.
- Kapur A, Haskovic A, Copra-Janicijevic A, Klepo L, Topcagic A, Tahirovic I, Sofic E. Spectrophotometric analysis of total ascorbic acid content in various fruits and vegetables. Bulletin of the Chemists and Technologists of Bosnia and Herzegovina 2012;38:39-42.
- Khyadagi Kashibai, Ravindra Jawadagi, Wali SY. Evaluation of chilli cultivars (*Capsicum annum L.*) for qualitative parameters at different maturity stages. The Asian Journal of Horticulture 2012;7(2):488-492.
- Malik AA, Chattoo MA, Sheemar G, Rashid R. Growth, yield and fruit quality of sweet pepper hybrid SH-SP-5 (*Capsicum annum L.*) as affected by integration of inorganic fertilizers and organic manures (FYM). Journal of Agricultural Technology 2011;7(4):1037-1048.
- Mclaren CA, Crawford MS. Soil Sci. Soc. Amer. J 1950;37:309.
- Panse VG, Sukhatme PV. Statistical Methods for Agricultural Workers. Indian Council of Agricultural Research, New Delhi 1967, P381.
- Pariari A, Khan S. Integrated nutrient management of chilli (*Capsicum annum L.*) in Gangetic alluvial plains. Journal of Crop and Weed 2013;9(2):128-130.
- Pawar AP, Parulekar YR, Mali VV, Haldavanekar PC, Mali PC 2018.
- Evaluation of various Chilli (*Capsicum annum L.*) genotypes grown for quality parameters under Konkani agro-climatic condition. International Journal of Chemical Studies 2018;6(4):586-589.
- Ranganna S. Manual of analysis of fruit and vegetables products. Tata Mc Graw Hill publishing Co. Ltd., New Delhi 1997, P9-82.
- Rego ER, Rego MM, Finger FL, Cruz CD. A diallel study of yield components and fruit quality in chilli pepper (*Capsicum baccatum*). Euphytica 2009;168:275-287.
- Samsangheile, Kanaujia SP. Integrated nutrient management for quality production of chilli on acid alfisol. Annals of Plant and Soil Research 2014;16(2):164-167.
- Shweta, Basavarajappa HR, Satish D, Jagadeesha RC, Hanachinmani CN, Dileepkumar AM. Genetic correlation and path coefficient analysis in chilli (*Capsicum annum L.*) genotypes for growth and yield contributing traits. Journal of Pharmacognosy and Phytochemistry 2018;7(2):1312-1315.
- Tandon HLS. (Ed.). Methods Of Analysis of Soils, Plants, Waters and Fertilizers. FDCO, New Delhi, India 1993; 24(30):58-62.
- Ullah MS, Islam MS, Islam MA, Haque T. Effects of organic manures and chemical fertilizers on the yield of brinjal and soil properties. J Bangladesh Agril. Univ 2008;6(2):271-276.