



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2021; 10(1): 104-108

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www.thepharmajournal.com

Received: 25-10-2020

Accepted: 05-12-2020

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Physical characteristics of chilli (*Capsicum annum L.*) germplasm under Konkan condition

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Abstract

The study aimed to determine the physical characteristics of chilli germplasm under Konkan condition during kharif season, 2018-2019. Wide variation was noted among the germplasm for physical characters viz., fruit diameter, fruit length, fruit weight and fruit colour. Among the hundred chilli germplasm, highest fruit diameter was recorded in DPLC-15, Wakawali-20 and Konkan kirti of pure chilli germplasm and WKLC-11 and WKLC-14 of F₅ germplasm. WKLC-6 of F₅ generation showed maximum fruit length, while maximum fruit weight was found in DPLC-15 of pure chilli germplasm. Light green, dark green colour at matured stage and light red, dark red colour at ripe stage were observed in the hundred chilli germplasm.

Keywords: Chilli germplasm, fruit diameter, fruit length, fruit weight, fruit colour

Introduction

Chilli (*Capsicum annum L.*) belongs to the family *Solanaceae* is one of the most important vegetable cum spice crop grown throughout the world for supply in the fresh market as well as for processing. It is consumed in various forms, fresh green chillies as vegetables to dried powder as spices. India is the largest producer, consumer and exporter of chilli in the world. It is predominantly popular for its green pungent fruits, which is used for culinary purpose. It is used in salads, chutney, sauces, pickles and it is a main ingredient of Indian diet in every home. The nutritive value of chilli is important for human diet. Particularly chilli needs heavy manuring for sound plant growth and high yield. This experiment was undertaken to study physical characteristics of hundred chilli germplasm under Konkan condition.

Materials and Methods

The present experiment was conducted at Central research station, Wakawali, Dapoli, during kharif season, 2018-2019. The details of the chilli germplasm used in the study were presented in table 1. The experiment was laid out in a completely randomised block design with three replication. Diameter and length of fruit was recorded from five selected plants by using vernier caliper and scale, respectively. The weight of fruit (g plant⁻¹) 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. 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) [2].

Result and Discussion

Analysis of variance revealed highly significant difference among the germplasm studied (table 2, 3, 4 and 5). From the table, it was evident that good amount of variation was 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 fruit diameter of hundred chilli germplasm ranged from 0.7 to 1.2 cm and observed that highest fruit diameter in DPLC-15, Wakawali-20 and Konkan kirti of pure chilli germplasm and WKLC-11 and WKLC-14 of F₅ germplasm. The fruit diameter values agree with the values reported by Samsangheile and Kanaujia (2014) [5] and Pawar *et al.* (2018) [3]. WKLC-6 (9.4 cm) of F₅ generation showed highest fruit length over other chilli germplasm. The minimum fruit length recorded in DPLC-9 of pure germplasm. However, highest fruit length

of 14.1 cm has been reported by Ullah *et al.* (2008) [6]. Among the hundred different chilli germplasm, highly noticeable fruit weight in DPLC-15 (31.60 g) of pure chilli germplasm while minimum in WKLC-4 (8.47 g) of F₂ generation. However, Pawar *et al.* (2018) [3] have reported the average fruit weight

of chilli to vary from 1.57 to 3.7 g. In case of fruit colour, the various colours were found light green, dark green at matured stage and light red, dark red at ripe stage among the hundred chilli germplasm. The findings of the study agree with, the findings of Pawar *et al.* (2018) [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. Guchedar
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
	F ₂ Generation
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
	F ₅ Generation
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
	F ₆ Generation
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

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 \pm	0.007	0.021	0.030		
CD (P=0.05)	0.020	0.059	0.086		

Table 3: Physical characteristics of F_2 generation of chilli germplasm

F ₂ 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_5 generation of chilli germplasm

F ₅ 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 F₆ generation of chilli germplasm

F ₆ 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		

Conclusion

From the above study it can be indicated that availability of germplasm possessing desirable physical characteristics.

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