

## Studies on suitability of chilli cultivars for traditional snack – Coated fried *mirchi*

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**SUMMARY :** The moisture content of chilli cultivars decreased on ripening, on the contrary capsicum content is increased. The less pungent and high moisture contained cultivars with more pericarp weight, girth, fruit weight were highly acceptable for coated fried *mirchi* preparation. The cultivars *Byadagi Dabbi*, *Byadagi Kaddi*, D. Deluxe, SH-5 and Hero were found suitable for coated fried *mirchi* preparation at green and ripe stage whereas SH-12 and HNo.9646 only at green stage. Green chillies were preferred more than ripe may be due to availability, tenderness and low capsicum content.

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Coated fried *mirchi* is a very popular snack which is relished by population irrespective of age and economic discrimination. Though initially started as family snack item in southern part of country including Karnataka, today preparation of *mirchi* has become an important unorganized sector encompassing large number of population starting from vendors to five star hotels. This snack item is consumed independently or in combination of cereal based snack items. The choice of customers is to have a mild flavour, low pungent product which satisfies the pallet of the consumer without irritation. Hence, choice of chilli for preparation of snack item is important step. Hence, study was under taken to know suitability of chilli cultivars grown in Karnataka for traditional snack item-coated fried *mirchi*.

### EXPERIMENTAL METHODS

Seventeen promising and released chilli cultivars of private and public firms were selected for study at green

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and ripe stages. Freshly harvested cultivars were thoroughly washed in running tap water to remove adhering dirt. The acceptance quality of the product is influenced by moisture and capsicum content of chilli cultivars. Hence, these parameters were estimated according to AOAC, (1990) and spectrophotometric method of Palicio (1977), respectively. For *fried mirchi* preparation, bengal gram batter was prepared by mixing bengal gram flour, salt, cumin seeds, turmeric powder and water. Then chillies were dipped in batter and fried in hot refined safflower oil till golden yellow colour on medium heat (230-232°C).

### Sensory evaluation of the product:

Sensory evaluation of fried coated *mirchi* was carried out by using nine point Hedonic scale for qualities like appearance, colour, pungency, texture, aroma and overall acceptability. The product was evaluated by 50 semi trained judges. The sensory scores were quantified and mean score of judges was computed and statically analyzed by using Factorial Completely Randomized Design.

### EXPERIMENTAL FINDINGS AND ANALYSIS

The moisture content of green chilli cultivars varied from 71.35 to 91.15g per cent, highest being noticed in SH-5 and lowest in MSH-11. Similarly, in ripe chilli cultivars maximum moisture content was found in SH-5(80.57%) and minimum in MSH-11 (66.44%). The capsicum content of green chilli cultivars ranged between 0.06 to 0.47 g per cent, maximum being noticed in Pusa Jwala (0.47g%) and

minimum in SH-5 (0.06 %). Whereas in ripe chilli cultivars, the variation was from 0.12 to 0.58g per cent, maximum being recorded in G-4 (0.58%) and minimum in *Byadagi Dabbi* (0.12%) (Table 1). Significant differences were observed between cultivars for capsicum content. The per cent decrease of moisture in chilli cultivars at ripe stage over green varied from 0.77 to 17.89 per cent, maximum decrease was found in *Byadagi Dabbi* and minimum in Namadari. With regard to capsicum, per cent increase in ripe chilli cultivars over green, maximum increase was found in *Byadagi Dabbi* (77.78 %) and minimum in Pusa Jwala (21.28 %). Similarly Xiao *et al.* (1991) reported that capsicum content increased gradually during ripening.

Though coated fried *mirchi* prepared from all chilli cultivars at green stage were acceptable for appearance, colour, texture and aroma, significant statistical differences were noticed between cultivars. A wide variation for pungency acceptability was apparent between the cultivars for the product. Among the cultivars, *Byadagi Dabbi*, *Byadagi Kaddi*, SH-5 and D.Deluxe were liked very much for pungency. Whereas SH-12 and Hero were liked moderately and HNo.9646 liked slightly, rest of the cultivars were disliked (Table 2). The overall acceptability of green chilli coated fried *mirchi* in terms

of cultivars, *Byadagi Dabbi*, *Byadagi Kaddi*, SH-5 and D.Deluxe were liked very much, whereas SH-12, HNo. 9646 and Hero liked moderately. It is evident that *Byadagi Dabbi*, *Byadagi Kaddi*, D.Deluxe, SH-5, Hero, SH-12 and H.No.9646 cultivars were found suitable at green stage.

The coated fried *mirchi* of all cultivars at ripe stage were acceptable for appearance, color, texture, aroma and significant differences were observed between cultivars (Table 3). For pungency character, among the cultivars studied *Byadagi Dabbi*, *Byadagi Kaddi* and SH-5 were highly acceptable while D.Deluxe and Hero were moderately acceptable and rest of the cultivars were disliked. The overall acceptability of ripe chilli product revealed, *Byadagi Dabbi*, *Byadagi Kaddi*, SH-5 and D.Deluxe were highly acceptable, while Hero was moderately acceptable and rest of the cultivars were disliked. As anticipated, the less pungent green cultivars with low capsicum and more moisture content in *Byadagi Dabbi*, *Byadagi Kaddi*, SH-5, Hero, SH-12, H.No. 9646 and D. Deluxe were highly acceptable for coated fried *mirchi* preparation. With respect to usage of ripe chilli, *Byadagi Dabbi*, *Byadagi Kaddi*, Hero, SH-5 and D. Deluxe were found acceptable and rest of the cultivars were disliked. This difference can be attributed to high capsicum content and

**Table 1 : Chemical composition of chilli cultivars at green and red ripe stage**

Sr. No.	Cultivars	Green stage		Red ripe stage		Moisture (%)	Capsaicin (%)
		Moisture (g%)	Capsaicin* (mg/100g)	Moisture (g%)	Capsaicin* (mg/100g)	Decrease in ripe over green	Increase in ripe over green
1.	Arka Lohit	75.40	0.23	73.79	0.37	2.14	60.87
2.	MSH-11	71.35	0.28	66.44	0.38	6.88	35.71
3.	Arka Harita	79.32	0.31	74.85	0.52	5.55	67.71
4.	G-4	77.51	0.36	70.92	0.58	8.50	70.97
5.	Byadagi Dabbi	89.33	0.07	73.35	0.12	17.89	71.43
6.	Byadagi Kaddi	76.12	0.09	71.30	0.16	6.29	77.78
7.	Pusa Jwala	72.55	0.47	70.81	0.57	2.49	21.28
8.	H. No-9646	77.60	0.33	72.19	0.50	6.97	51.52
9.	Indam-5	75.39	0.41	70.93	0.51	5.92	24.39
10.	Indam-10	79.11	0.32	75.78	0.43	4.21	26.83
11.	Namadari	76.85	0.37	76.26	0.52	0.77	40.54
12.	Godavari	75.67	0.30	70.98	0.41	6.20	36.67
13.	Devanur Deluxe	83.09	0.22	75.75	0.31	10.63	40.91
14.	Hero	82.90	0.25	76.07	0.41	8.24	64.00
15.	SH-5	91.15	0.06	80.57	0.16	11.61	32.26
16.	SH-12	80.94	0.31	77.07	0.47	4.78	51.61
17.	BSS-273	79.70	0.38	68.50	0.51	14.05	32.21
	S.Em±	0.082	0.010	0.082	0.010		
	CD at 5%	0.227	0.027	0.227	0.027		
	CD at 1%	0.299	0.036	0.299	0.036		

\* Moisture free basis

**Table 2 : Mean organoleptic scores\* for green chilli coated fried *mirchi***

Sr. No.	Cultivars	Appearance	Colour	Pungency	Aroma	Texture	Acceptability
1.	Arka Lohit	6.90	7.55	4.10	7.10	7.15	5.95
2.	MSH-11	7.55	7.55	4.60	7.85	7.45	6.70
3.	Arka Harita	6.70	7.70	4.75	7.50	7.05	6.05
4.	G-4	6.40	7.95	4.95	7.95	7.20	6.60
5.	Byadagi Dabbi	9.00	8.30	8.95	8.85	8.90	8.95
6.	Byadagi Kaddi	8.90	9.00	8.90	8.85	8.75	8.90
7.	Pusa Jwala	7.10	8.40	4.50	6.95	7.40	6.50
8.	H.No-9646	8.50	7.90	6.35	8.25	7.70	7.30
9.	Indam-5	6.95	7.60	5.15	7.20	7.10	6.30
10.	Indam-10	7.80	7.60	4.60	7.40	7.30	6.15
11.	Namadhari	6.60	7.75	4.45	7.30	7.20	6.05
12.	Godavari	6.85	7.80	3.70	6.95	6.90	5.15
13.	Devanur Deluxe	8.80	7.70	8.45	8.55	8.50	8.65
14.	Hero	7.45	7.50	7.10	7.10	8.20	7.05
15.	SH-5	8.80	7.85	8.65	8.40	8.55	8.70
16.	SH-12	8.35	8.35	7.10	8.55	8.40	7.20
17.	BSS-273	6.85	8.20	5.55	7.10	7.55	6.45
	S.Em±	0.114	0.133	0.125	0.105	0.128	0.109
	CD at 5 %	0.316	0.369	0.347	0.290	0.355	0.302
	CD at 1%	0.415	0.485	0.457	0.382	0.467	0.397

\* Nine point hedonic scale,

**Table 3 : Mean organoleptic scores for ripe chilli coated fried *mirchi***

Sr.No.	Cultivars	Appearance	Colour	Pungency	Aroma	Texture	Acceptability
1.	Arka Lohit	7.00	7.40	3.95	7.10	6.75	3.45
2.	MSH-11	7.20	7.30	3.85	7.05	6.80	3.65
3.	Arka Harita	7.15	7.50	4.05	6.95	6.95	3.85
4.	G-4	7.45	7.40	4.15	7.15	7.15	3.90
5.	Byadagi Dabbi	8.90	8.95	8.95	8.90	8.85	8.90
6.	Byadagi Kaddi312	8.90	8.90	8.90	8.80	8.80	8.85
7.	Pusa Jwala	7.10	7.25	3.95	7.20	6.60	3.80
8.	H.No-9646	6.75	7.35	3.70	7.05	6.65	3.80
9.	Indam-5	6.90	7.40	3.55	7.10	6.65	4.05
10.	Indam-10	7.20	7.35	3.55	6.90	6.60	3.95
11.	Namadhari	6.85	7.55	3.50	6.65	6.80	3.85
12.	Godavari	7.20	7.50	3.90	6.60	6.95	3.65
13.	Devanur Deluxe	8.35	8.60	7.75	8.30	8.45	8.20
14.	Hero	7.85	7.60	7.60	7.80	7.60	7.60
15.	SH-5	8.60	7.80	8.10	8.40	8.40	8.40
16.	SH-12	7.20	7.90	3.45	6.80	7.15	3.60
17.	BSS-273	7.30	7.45	3.50	7.50	6.85	3.60
	S.Em±	0.132	0.108	0.129	0.120	0.130	0.125
	CD at 5 %	0.365	0.300	0.357	0.333	0.360	0.345
	CD at 1%	0.480	0.395	0.470	0.439	0.474	0.454

\* Nine point hedonic scale

**Table 4 : Physical characteristics of chilli cultivars at green stage**

Sr. No.	Cultivars	Fruit weight (g/10 fruits)	Fruit girth per fruit (cm)	Pericarp weight (g/10 fruits)	Seeds per pod (n)	Seed weight (g/10 fruits)	Fruit length per fruit (cm)
1.	Arka Lohit	28.06 (25.50 – 28.96)	3.01 (2.6 – 3.2)	24.27 (22.14- 25.81)	74 (38 – 82)	5.4 (2.4 – 6.1)	8.74 (8.2 – 9.3)
2.	MSH –11	25.94 (25.6 – 26.24)	2.32 (2.1 – 2.5)	20.4 (15.5 - 22.4)	80 (32 – 86)	4.7 (3.0 – 5.2)	6.17 (5.8 – 6.8)
3.	Arka Harita	34.94 (23.98 – 36.11)	3.29 (3.1– 3.4)	24.06 (19.8 - 34.2)	69 (34 – 86)	3.7 (2.6 – 4.68)	6.02 (5.1 –6.5)
4.	Guntur	37.96 (37.92 – 38.02)	4.86 (4.0 – 6.2)	25.62 (21.9 - 29.9)	85 (45 – 90)	3.9 (2.9 – 4.42)	6.60 (5.7 – 7.7)
5.	Byadagi Dabbi	120.27 (118.24 –122.04)	8.25 (7.9 – 8.9)	112.3 (110.1 – 122)	127 (98 – 197)	7.4 (4.7 – 8.2)	10.36 (9.2 – 11.3)
6.	Byadagi Kaddi	34.59 (32.24 – 36.94)	4.40 (3.6 – 5.1)	25.23 (26.4 - 29.2)	68 (32 – 99)	5.42 (3.76 – 6.73)	14.19 (12.0 – 16.8)
7.	Pusa Jwala	36.87 (36.18 – 38.19)	3.27 (2.5 – 3.8)	26.34 (24.8 - 28.42)	87 (69 – 99)	5.93 (4.46 – 7.01)	10.15 (10.30 – 19.9)
8.	H.N0-9646	49.20 (48.14 – 50.98)	3.54 (3.3 – 3.9)	33.34 (30.1 - 36.2)	78 (50 – 89)	7.33 (5.45 – 8.63)	9.28 (9.6 – 10.6)
9.	Indam – 5	43.04 (39.98 – 44.14)	2.93 (2.8 – 3.1)	39.23 (36.8 - 47.2)	112 (97 – 168)	4.80 (3.4 – 5.38)	9.23 (8.9 – 9.6)
10.	Indam –10	41.91 (40.96 – 42.14)	3.34 (3.0 – 3.8)	35.52 (30.9 - 39.0)	63 (59 – 72)	5.2 (4.4 – 6.91)	10.43 (11.85 – 13.2)
11.	Namadari	44.75 (44.06 – 45.24)	3.43 (3.2 – 3.6)	27.40 (26.9 - 28.40)	75 (61 – 83)	5.48 (4.6 – 7.02)	11.40 (9.4 – 11.75)
12.	Godavari	28.84 (26.98 – 29.90)	2.67 (2.1 – 3.0)	22.35 (19.90- 24.38)	51 (39 – 58)	4.89 (3.98 – 5.75)	7.60 (5.3 – 8.01)
13.	Devanur Deluxe	41.25 (40.84 – 42.82)	4.27 (3.70– 5.90)	32.63 (30.4 - 36.0)	66 (49 – 74)	4.13 (2.8 – 4.47)	10.10 (8.9 – 10.30)
14.	Hero	61.60 (60.19 – 63.20)	3.99 (3.2 – 4.9)	55.27 (46.2 - 61.30)	86 (68 – 115)	5.28 (3.76 – 5.88)	11.55 (10.0 – 14.2)
15.	SH-5	128.08 (127.98 – 128.97)	9.25 (8.86 – 9.75)	120.42 (112 – 128.02)	43 (33 – 51)	2.48 (1.98 – 2.84)	10.12 (8.2 – 13.2)
16.	SH-12	43.10 (41.94 – 44.24)	5.75 (3.36 – 6.20)	36.45 (32.46 - 38.33)	72 (54 – 94)	5.45 (3.96 – 6.01)	12.14 (9.4 – 12.30)
17.	BSS – 273	43.87 (43.82 – 46.22)	5.46 (3.26 – 5.67)	37.63 (32.95 - 39.17)	68 (56 – 83)	4.93 (3.25 – 5.85)	9.5 (9.2 – 10.4)

Figures in parenthesis indicate range

decreased moisture on ripening (Table 1).

A wide variation in physical characteristics such as length, girth, number of seeds, seed weight, pericarp weight and fruit weight was observed between the cultivars and stage of maturity which could be due to genetic make up (Table 4 and 5). The cultivars which had more pericarp weight, girth, whole chilli fruit weight and moisture content in *Byadagi Dabbi*, *Byadagi Kaddi*, SH-5 and D. Deluxe were highly acceptable for coated fried *mirchi* preparation both at green and ripe stage (Table 2 and 3). Even though

these cultivars contained more number of seeds, they were less pungent.

Among the maturity stages, all the cultivars at green stage were acceptable for coated fried *mirchi* preparation except Godavari and Arka Lohit because the fruits had thin pericarp, small size and high capsicum. Whereas at ripe stage the cultivars *Byadagi Dabbi*, *Byadagi Kaddi*, SH-5, Hero and D. Deluxe were acceptable for coated fried *mirchi* preparation. This difference can be attributed to increase in capsicum and decrease in moisture content

**Table 5 : Physical characteristics of chilli cultivars at ripe stage**

Sr. No.	Cultivars	Fruit weight (g/10 fruits)	Fruit girth per fruit (cm)	Pericarp weight (g/10 fruits)	Seeds per pod (n)	Seed weight (g/10 fruits)	Fruit length per fruit (cm)
1.	Arka	33.29	3.11	31.27	77.20	7.52	9.43
	Lohit	(29.38-34.81)	(3.70-4.10)	(29.70-34.29)	(67-97)	(6.92-8.40)	(9.20-9.8)
2.	MSH –11	27.42	2.79	24.86	73.70	6.84	7.02
		(24.56-26.69)	(2.80-3.40)	(22.64-26.83)	(58-91)	(5.12-7.03)	(6.00-7.30)
3.	Arka	42.36	4.20	32.39	74.30	6.29	7.43
	Harita	(38.89-44.16)	(4.00-4.40)	(29.54-34.24)	(69-89)	(6.60-7.02)	(6.90-8.10)
4.	Guntur	47.82	4.67	35.54	67.70	6.26	7.54
		(46.18-48.87)	(4.30-5.20)	(32.31-36.93)	(48-83)	(4.75-6.98)	(7.00-8.70)
5.	Byadagi	159.29	8.64	136.93	133.70	16.69	10.36
	Dabbi	(148.67-162.94)	(7.30-9.40)	(135.02-139.24)	(105-177)	(12.73-17.76)	(9.20-11.30)
6.	Byadagi	43.54	5.22	29.68	88.70	9.23	15.65
	Kaddi	(38.96-44.28)	(4.40-6.20)	(28.31-30.29)	(76-102)	(7.64-9.73)	(12.70-18.80)
7.	Pusa	43.68	4.42	29.30	95.33	6.41	11.19
	Jwala	(37.87-45.94)	(4.00-4.80)	(27.13-31.14)	(89-106)	(5.59-7.42)	(11.20-12.90)
8.	H.N0-9646	53.72	4.02	26.79	78.90	8.24	11.60
		(50.63-54.46)	(3.61-4.28)	(24.48-27.95)	(65-89)	(7.19-9.67)	(11.00-11.90)
9.	Indam – 5	47.79	3.12	44.28	40.20	7.23	11.82
		(58.81-63.84)	(2.64-3.24)	(38.64-46.24)	(36-68)	(6.72-9.54)	(11.20-12.70)
10.	Indam – 10	47.79	3.78	38.20	84.50	7.23	13.23
		(46.64-49.74)	(3.23-3.86)	(26.39-39.14)	(70-88.40)	(4.32-8.27)	(11.20-15.00)
11.	Namandari	43.13	5.76	29.50	91.20	7.90	11.96
		(410.27-45.24)	(4.14-5.84)	(26.35-31.72)	(68-96)	(5.56-8.91)	(10.30-12.90)
12.	Godavari	30.88	3.28	25.71	67.40	5.55	8.46
		(28.33-32.87)	(2.90-3.36)	(24.78-27.43)	(38-79)	(2.68-6.61)	(7.76-9.23)
13.	Devanur	58.88	5.08	56.37	84.20	5.55	10.73
	Deluxe	(58.44-60.29)	(4.56-5.21)	(49.38-57.66)	(68-94)	(3.21-7.42)	(10.20-11.80)
14.	Hero	70.22	5.04	76.91	109.80	9.54	15.25
		(67.39-72.61)	(4.42-5.11)	(69.14-80.92)	(38-120)	(8.86-11.24)	(14.30-15.58)
15.	SH-5	145.18	12.15	136.45	33.24	3.39	8.25
		(143.19-148.60)	(9.78-13.96)	(124.75-138.42)	(28-49)	(1.98-4.46)	(7.41-9.24)
16.	SH-12	52.29	6.70	42.36	74.36	6.72	10.75
		(48.24-53.11)	(5.27-6.88)	(39.14-44.62)	(52-82)	(4.42-7.84)	(10.90-12.90)
17.	BSS – 273	48.70	6.89	40.36	85.60	5.46	11.14
		(46.26-50.23)	(6.01-6.92)	(38.46-42.29)	(58-106)	(4.12-6.69)	(10.64-13.24)

Figures in parenthesis indicate range

on ripening. The per cent increase in capsicum over green stage was high and ranged between 21.28 to 77.78 per cent. Green chillies were more preferred over ripe for coated fried *mirchi* preparation may be because of availability, tenderness of the fruit and low in capsicum content.

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