

## Characterization of Chow-Chow (*Sechium edule*) Germplasm of North-eastern Region of India for Economic Traits

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A total of thirty-eight accessions of Chow-chow were collected from Meghalaya (20), Mizoram (2) and Sikkim (16). These accessions were grown in augmented design at Barapani (Meghalaya) to study the economic traits both quantitative as well as qualitative. A range of fruit colour was observed such as dark green, light green, yellow, light yellow, cream and white. A total of 13 accessions were found without spine and remaining were having spine from soft to hard in nature. The fruit length varied from 5.7 cm (Sikkim-11) to 15.1 cm (Megha-21) with average length of 11.3 cm. The maximum fruit diameter was recorded 10.9 cm for Sikkim-16 followed by 10.3 for Megha-13 and 10.2 for Megha-14 while lowest 5.2 cm for Sikkim-3. The number of fruits per plant ranged between 2.5 (Sikkim-3) to 73.3 (Megha-20) with average fruit per plant of 28.2. The average fruit weight varied from 134 gm (Megha-9) to 406 gm (Megha-3). The highest fruit yield per plant was recorded 25.0 kg for Sikkim-17 while lowest 0.50 kg for Sikkim-3. The average fruit yield per plant was 7.6 kg. The accessions collected from Meghalaya were early maturing while the accessions collected from Sikkim late in maturity. Biochemical analysis of fruit revealed that higher TSS content observed for Megha-16 (6.2%), Sikkim-12 (6%) and Sikkim-10 (5.5%) while high level of ascorbic acid 24.7 mg/100gm in Sikkim-1 and followed by 23.4 mg/100gm in Sikkim-13.

**Key Words:** Chow-chow, Characterization, NEH region, Germplasm

### Introduction

Chow-chow (*Sechium edule* Sw.), an underutilized cucurbitaceous vegetable, native to Central America and humid tropical region of Mexico (Singh, 1990), is monoecious, perennial vine with tuberous roots. Its vine produces large number of fruits that are single seeded and viviparous. In India, chow-chow is widely grown in Madurai and Nilgiri district of Tamil Nadu, Karnataka, West Bengal, Mandi district of Himachal Pradesh and entire North Eastern Hill (NEH) region. In NEH region, chow-chow is grown in kitchen gardens of every tribal, as an important component of their daily diet. Fruits of this crop are mainly used as vegetable and it is also used for making sweets and sauce. Though, it is a native of Mexico but considerable diversity is found in NEH region particularly, Meghalaya, Mizoram, and Sikkim (Rai *et al.*, 2006). Mizoram is the leading state with an estimated area of 845 ha and 10985 MT production (Sanwal, 2008) It is mainly propagated by means of seed (whole fruit with seed)/ sprouted fruits, which are main cause of variation existing in the region (Yadav *et al.*, 2005) and Rai *et al.* (2002). Therefore, an attempt has been made to collect and characterize chow-chow germplasm of this region.

### Materials and Methods

A total of thirty eight accessions of chow-chow were collected from Meghalaya (20), Mizoram (2) and Sikkim (16) states of NEH region of India. The sprouted fruits of all the genotypes were planted at experimental farm of Division of Horticulture, ICAR Research Complex for NEH region, Umiam, Meghalaya during the rainy season of 2006-07 in Augmented Complete Block Design. The sprouted fruits of each genotype were planted in hill at spacing of 2.5m between row to row and 2 m within rows consisting 5 plants in each row, having five rows of each accession. The plants were trained on bamboo thatch. The observations were recorded for ten quantitative and qualitative traits, viz. fruit length, fruit diameter, number of fruits per plant, average fruit weight, fruit yield per plant, spine character, fruit colour, TSS, acidity and ascorbic acid. Mean data of quality and quantitative characters were subjected to statistical analysis.

### Results and Discussion

The qualitative and quantitative traits are presented in Table 1. A range of fruit colour was observed such as dark green, light green, yellow, light yellow, cream

**Table 1. Quantitative and qualitative characters of Chow-chow**

Genotypes	Fruit length (cm)	Fruit diameter (cm)	No. of fruits/plant	Average fruit weight(gm)	Fruit yield/plant (kg)	Spine	Fruit colour	TSS %	Acidity %	Ascorbic acid (mg/100 g)
Megha-1	10.86	7.36	33.67	396	13.33	Less spine	Dark green	3.60	0.32	10.58
Megha-2	13.66	7.32	13.67	207	2.83	No spine	Light green	3.00	0.26	14.10
Megha-3	12.92	7.40	33.00	406	13.42	Hard, more spine	Dark green	3.40	0.38	14.10
Megha-4	9.12	5.70	13.67	137	1.88	No spine	Light yellow	2.80	0.19	14.10
Megha-5	13.52	7.44	33.67	248	8.33	Less spine	Yellow	3.00	0.32	10.58
Megha-6	12.00	6.92	39.00	256	10.00	Very hard	Light yellow	2.80	0.45	10.58
Megha-7	13.80	7.10	9.00	239	2.15	Less spine	Light green	3.00	0.38	17.63
Megha-8	10.94	6.70	27.33	159	4.33	No spine	Green	2.80	0.26	10.58
Megha-9	10.10	6.90	31.40	134	4.20	No spine	White	3.60	0.32	10.58
Megha-10	14.50	8.62	19.17	296	5.67	Less spine	White	2.60	0.26	17.63
Megha-12	12.80	8.90	37.50	326	12.25	Less spine	Light green	5.00	0.32	10.48
Megha-13	12.40	10.30	24.67	267	6.58	Less spine	Light green	4.80	0.32	10.40
Megha-14	12.20	10.20	32.67	220	7.20	Less spine	Light green	4.60	0.26	9.36
Megha-15	13.80	7.46	51.33	261	13.42	Less soft	Light green	5.00	0.38	9.88
Megha-16	12.20	7.70	50.33	215	10.83	Less spine	Light green	6.20	0.70	9.88
Megha-17	14.76	8.62	49.67	285	14.17	No spine	Light green	4.90	0.38	10.48
Megha-18	12.80	8.90	28.67	302	8.67	No spine	Light green	0.40	0.20	10.48
Megha-19	7.20	6.10	32.00	242	7.75	Soft spine	Light green	3.40	0.38	10.58
Megha-20	11.92	7.14	81.00	370	30.00	No spine	Light green	3.00	0.96	9.88
Megha-21	15.10	8.90	71.00	366	26.00	No spine	Light green	5.00	0.77	10.40
Sikkim-1	11.00	8.10	11.50	405	4.67	Less spine	Cream	3.00	0.32	24.68
Sikkim-2	7.50	5.40	13.33	375	5.00	Hard spine	Dark green	3.20	0.26	10.58
Sikkim-3	9.30	5.20	2.50	200	0.50	Less spine	Light green	3.00	0.26	14.10
Sikkim-4	12.10	6.30	18.00	267	4.80	No spine	Light green	2.40	0.38	17.63
Sikkim-5	12.70	7.50	5.33	354	1.89	No spine	Light green	3.00	0.32	10.58
Sikkim-6	10.20	7.50	10.33	350	2.58	Hard spine	Cream	4.00	0.70	14.10
Sikkim-8	9.50	7.80	9.50	149	1.42	Spine	Light green	5.80	1.15	15.28
Sikkim-9	11.10	7.30	11.00	200	2.22	Less spine	Dark green	3.60	0.32	10.58
Sikkim-10	11.10	8.90	35.00	190	6.67	No spine	Green	5.50	1.60	9.56
Sikkim-11	5.70	4.30	20.00	350	7.00	Less spine	Cream	5.00	1.66	10.48
Sikkim-12	12.80	10.00	17.00	250	4.25	Less spine	Cream	6.00	1.60	10.40
Sikkim-13	12.00	9.80	18.00	250	4.50	Hard spine	Light green	5.00	1.15	23.40
Sikkim-14	9.80	8.80	15.00	188	2.82	No spine	Light green	5.00	1.14	10.48
Sikkim-15	8.30	8.20	33.33	330	11.00	Less spine	Light green	4.00	1.60	13.00
Sikkim-16	12.80	10.90	23.33	271	6.33	Hard spine	Light green	5.00	0.90	10.48
Sikkim-17	6.60	6.40	79.00	405	32.00	Less spine	Cream	4.80	0.90	13.00
Mizoram-2	9.00	6.70	46.00	178	8.17	No spine	Dark green	4.80	0.45	17.63
Mizoram-3	12.30	9.30	22.40	295	6.60	Less spine	Dark green	4.80	0.06	10.40
Mean	11.29	7.71	28.16	270.65	7.60			4.33	0.60	12.59
Range	5.70-15.8	5.2-10.9	2.5-73.33	134-406	0.50-25.0			0.40-6.2	0.06-1.66	9.36-24.68
CD at 5%	2.06	1.54	5.86	19.45	3.36			0.42	0.12	1.14

and white. As far as the spine is concerned, 13 accessions were found without spine and remaining had spine from soft to hard. The fruit length varied from 5.7 cm (Sikkim-11) to 15.1 cm (Megha-21) with average length of 11.3 cm. The maximum fruit diameter was recorded 10.9 cm for Sikkim-16 followed by 10.3 for Megha-13 and 10.2 for Megha-14 while lowest 5.2 cm for Sikkim-3. The number of fruits per plant ranged between 2.5 (Sikkim-3) to 73.3 (Megha-20) with average fruit per plant of 28.2. The average fruit weight varied from 134 gm (Megha-9) to 406 gm (Megha-3). The highest fruit yield per plant was recorded 25.0 kg for Sikkim-17 while lowest 0.50 kg for Sikkim-3. The average fruit yield per plant was 7.6 kg. Biochemical analysis of fruit revealed

that higher TSS content observed for Megha-16 (6.2%), Sikkim-12 (6%) and Sikkim-10 (5.5%) while high level of ascorbic acid 24.7 mg/100gm in Sikkim-1 and followed by 23.4 mg/100gm in Sikkim-13.

The accessions collected were classified based on fruit maturity. Accessions from Meghalaya were early maturing (May–June) while the accessions Sikkim-11, 12, 14, 15 and 17 were late in maturity (mid October to January). The remaining accessions, Sikkim-2, 3, 4, 5, 6, 8, 9, 10 and 16, Mizoram-2 and 3 were medium (August to mid October) in maturity.

Considerable variation was found in respect of various fruit characteristics like number, size, shape, weight, diameter and colour as well as presence of spine

and other biochemical traits in present study. Similar variation is observed in some of the earlier reports on indigenous chow-chow collections (Singh *et al.*, 2002, Yadav *et al.*, 2005, Rai *et al.*, 2006, Sanwal *et al.*, 2008).

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