

Comparative performance of different varieties of large cardamom (*Amomom subulatum* Roxb.) under mid altitude of Arunachal Pradesh

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Abstract

Studies were conducted to assess the performance of eight varieties of large cardamom at mid altitudes (660 meters MSL) in Arunachal Pradesh. Out of the eight varieties tested, Ramla, Sawney, Madhusey and Ramsey performed better and can be introduced for commercial cultivation at mid altitude region of Arunachal Pradesh.

Key words: *Amomom subulatum*, evaluation, large cardamom.

Introduction

Large cardamom (*Amomom subulatum* Roxb.) is a shade loving and natural component of indigenous forest of Sub-Himalayan tracts at an altitude between 600 to 2000 M above MSL. It is an important crop of Sikkim from where it spread to Northeast States and parts of West Bengal and also to neighbouring countries (Peter & Kandiannan 1999). It is one of the oldest spices, mainly used for flavouring curries, soups, sauces and other food preparations. The dry capsules of large cardamom are exported to Middle East, Europe and Eastern Asia. Considering the export potential, the area under large cardamom needs to be extended beyond the traditionally growing state of Sikkim and Darjeeling District of West Bengal. Eight types of large cardamom were found in natural forest of Arunachal Pradesh (Dubey & Singh 1999), indicating its suitability for commercial cultivation in this state. Besides, large cardamom cultivation requires very less inputs. Labour is the major input, providing employment opportunities. Keeping these in view, a

trial was conducted to find out the varieties suitable for mid altitude of Arunachal Pradesh.

Materials and methods

The present investigation was carried out on eight varieties of large cardamom, out of which six were collected from Sikkim (Ramla, Zango Golsey, Golsey, Sawney, Ramsey and Madhusey) and the other two (Bebo Dark Red and Bebo Light Red) are native types of Arunachal Pradesh. The experiment was conducted at ICAR Research Complex for NEH region, Arunachal Pradesh centre, Basar during 1996 to 2000 in randomized block design with five replications. The crop was planted at a spacing of 2 m x 1.5 m. Data on plant height and number of suckers/clump were recorded on five randomly selected plants in each replication during 1997-1999. Data on yield and physical characters of capsules were recorded during 1999 and 2000.

Results and discussion

Among the eight varieties tested, Ramsey had attained maximum plant height (74.36 cm)

followed by Golsey (68.61 cm), Bebo Light Red (63.86 cm) and Sawney (61.51 cm) after one year of growth (Table 1). In all other varieties the plant height was less than 60 cm in the first year. In second and third years, maximum height was recorded in Bebo Dark Red (119.30 cm) and Bebo Light Red (242.50 cm), respectively and it was minimum in Zango Golsey (65.68 cm) in second year and in Ramsey (116.43 cm) in the third year of planting. Plants attained full height after three years of establishment in all the varieties. In the fourth year after planting, maximum height was recorded in Bebo Light Red (258.58 cm), followed by Bebo Dark Red (213.80 cm) and Ramla (187.42 cm). Average plant height of four years was maximum in the variety Bebo Red (196.58 cm), followed by Bebo Light Red (166.46 cm), Ramla (130.87 cm) and Madhusey (126.84 cm). The variety Zango Golsey had minimum height (86.44 cm). The number of suckers per clump increased with the age of the plant and the average number was maximum in Ramla (21.21), followed by Sawney (19.08), Ramsey (17.52) and Madhusey (16.53) and it was least in Bebo Light Red (9.30).

The data also revealed that the varieties differed significantly in yield (Table 2). Sawney gave highest yield (31.73 q ha⁻¹) in 1999 but in next year, highest yield was recorded in Ramla (31.97 q ha⁻¹). However, these two varieties

were on par in the yield in both the years. Lowest yield was in Zango Golsey (3.78 q ha⁻¹) in first year and in Golsey (5.84 q ha⁻¹) in second year. An increasing trend in yield was noticed in all the varieties during second year of fruiting, except in Bebo Dark Red, which showed slight, decrease in yield. A wide range of variation for number of bunches/clump was also recorded. Ramla had highest number per heap in the first year (15.00) and also in the second year (16.60). However, it was lowest in Zango Golsey in first year (3.40) and second year (3.80) of fruiting.

Significant difference was observed among the varieties with respect to number of capsules/bunch (Table 2). Bebo Dark Red had highest number of capsules per bunch (12.42) followed by Ramla (11.40) and Sawney (9.60) in the first year while Ramla produced highest number of capsules/bunch (13.14) in the second year of fruiting which was statistically on par with the capsules obtained in Bebo Dark Red (12.80). The minimum number of capsules/bunch was recorded in Zango Golsey (5.00, 4.68 in first and second year of fruiting, respectively).

The varieties also showed significant variation in weight of bunch (Table 2). The Bebo Dark Red variety registered the highest bunch weight (94.96 g, 96.80 g) followed by Bebo Light Red (80.82 g, 80.12 g), Sawney (65.84 g, 67.42 g) and

Table 1. Plant height and number of suckers/clump in different varieties of large cardamom

Variety	Plant height (cm)					Number of suckers clump ⁻¹				
	1997	1998	1999	2000	Mean	1997	1998	1999	2000	Mean
Ramsey	74.36	105.50	116.43	103.94	100.06	5.66	18.80	21.20	24.40	17.52
Zango Golsey	48.30	65.68	121.43	110.36	86.44	3.00	12.10	14.50	18.70	12.08
Golsey	68.61	77.10	149.43	133.62	107.19	5.33	10.20	18.70	20.50	13.68
Madhusey	50.00	102.00	178.33	177.06	126.84	3.00	15.60	23.10	24.40	16.53
Sawney	61.51	86.90	170.53	175.34	123.57	5.50	16.20	24.90	29.70	19.08
Ramla	54.91	89.28	191.87	187.42	130.87	3.33	14.70	30.50	37.50	21.21
Bebo Red	55.63	119.30	207.85	213.80	196.58	1.00	7.00	14.40	16.40	9.70
Bebo Light Red	63.86	100.90	242.50	258.58	166.46	2.00	4.50	14.90	15.70	9.30

Table 2. Yield and yield attributing characters of large cardamom varieties

Variety	Yield clump ⁻¹ (g)		Yield (q ha ⁻¹)		No. of bunches clump ⁻¹		No. of capsules bunch ⁻¹		Weight of bunch (g)		Capsule diameter (cm)		Capsule length (cm)	
	1999	2000	1999	2000	1999	2000	1999	2000	1999	2000	1999	2000	1999	2000
Ramsey	605.78	645.28	17.99	21.96	9.20	12.80	8.56	12.20	64.80	66.68	1.64	1.65	2.21	2.22
Zango Golsey	113.36	204.77	3.78	6.94	3.40	3.80	5.00	4.68	33.64	35.02	1.89	1.85	2.19	1.94
Golsey	159.28	177.44	5.31	5.84	11.20	3.80	5.96	5.60	37.92	35.10	1.99	1.99	2.46	2.48
Madhusey	750.54	832.40	25.02	28.01	12.20	11.60	8.41	10.88	64.73	66.58	1.65	1.73	2.35	2.35
Sawney	951.68	949.38	31.73	31.75	14.40	12.80	9.60	10.20	65.84	67.42	1.55	1.61	2.42	2.30
Ramla	949.16	944.56	31.63	31.97	15.00	16.60	11.44	13.14	62.76	63.44	1.68	1.63	2.51	2.56
Bebo Red	672.16	691.38	24.22	23.06	7.00	7.40	12.40	12.80	94.96	96.80	1.88	1.89	2.82	2.88
Bebo Light Red	404.98	494.41	13.51	16.58	5.20	6.60	9.62	12.28	80.82	80.12	1.69	1.72	2.61	2.59
CD at 5%	78.88	82.88	2.84	2.69	3.97	3.77	2.35	2.35	7.05	7.18	0.21	0.23	0.32	0.32

Ramsey (64.80 g, 66.80 g) in the first and second year of fruiting, respectively. The Zango Golsey had lowest bunch weight in both the years (33.64 g, 35.02 g). The capsule length and diameter also differed significantly among the varieties (Table 2). Bebo Dark Red had highest length of fruit and diameter followed by Bebo Light Red and Ramla in both years.

It is obvious that fresh and dry weight of capsule varied significantly (Table 3). The fresh weight of 20 capsules in first and second year was highest (198.12 g, 201.20 g) in Bebo Light Red followed by Bebo Dark Red (166.20 g, 165.18 g), Ramla (74.58 g, 80.96 g) which were statistically on par with Madhusey (70.24 g, 65.86 g) in both years. The dry weight of 20

Table 3. Capsule and seed weight in different varieties of large cardamom

Variety	Fresh weight of 20 capsules (g)		Dry weight of 20 capsules (g)		Seeds capsule ⁻¹		Weight of 1000 seeds (g)	
	1999	2000	1999	2000	1999	2000	1999	2000
Ramsey	67.60	67.02	15.51	15.41	41.60	42.32	18.28	18.28
Zango Golsey	65.66	65.86	17.25	17.20	43.60	39.73	10.76	10.91
Golsey	56.34	55.94	14.32	14.45	29.00	33.38	16.60	16.33
Madhusey	70.24	72.50	18.73	18.25	84.80	87.42	15.49	15.80
Sawney	54.92	54.94	11.82	12.13	27.20	28.66	14.86	15.09
Ramla	74.58	80.96	16.54	16.07	59.20	58.28	14.87	14.53
Bebo Red	166.20	165.18	17.90	17.83	54.20	57.14	13.68	13.24
Bebo Light Red	198.12	201.20	19.74	19.86	52.20	54.96	20.15	20.58
CD at 5%	20.68	20.53	3.19	2.98	10.36	9.88	1.07	1.04

capsules was found to be highest in Bebo Light Red (19.74 g, 19.86 g) followed by Madhusey (18.73 g, 18.25 g) which were on par with Bebo Dark red (17.90 g, 17.83 g) and Zango golsey (17.25 g, 17.20 g) during both the years. The lowest dry weight was recorded in Sawney (11.82 g, 12.13 g).

Data revealed that number of seeds per capsule and weight of seeds varied significantly in different varieties (Table 3). The highest number of seeds per capsule in first and second year was found in Madhusey (84.80, 87.42) followed by Ramla (59.20, 58.28), and were on par with Bebo Dark Red (54.20, 57.14), Bebo Light Red (52.20, 54.96) in both the years. The minimum number of seeds per capsule was found in Sawney (27.20, 28.66) in both the years. The weight of 1000 seeds also varied significantly

among the varieties. Bebo Light Red had highest weight (20.15 g, 20.58 g) followed by Ramsey (18.28 g, 18.28 g), Golsey (16.60 g, 16.33 g) and Madhusey (15.49 g, 15.80 g), which were statistically on par with Sawney (14.86 g, 15.09 g) in both years.

Based on the above results, varieties Ramla, Sawney and Madhusey are suitable for cultivation in mid altitude regions of Arunachal Pradesh.

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