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Short Communication

A bold capsuled cardamom [*Elettaria cardamomum* (L.) Maton] variety PV 2 — Suitable for cardamom Hill Reserves of Kerala

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Propagation of cardamom [*Elettaria cardamomum* (L.) Maton] through seeds produces heterogeneous progeny, which is genetically not uniform failing to produce true to type due to out breeding nature of crop. Pattanshetti (1980) [1] noticed high degree of variability in yield among the seedling progenies on account of genetic heterozygocity by cross-pollination. Such enormous variation in yield in the seedling population helps in the selection of high yielding varieties in cardamom, aptly meeting the present day demand in the marketing front. Hence an extensive research work was conducted with an objective of developing bold capsuled and high yielding variety from open pollinated seedlings of PV 1.

Seeds were collected from PV 1, a Malabar type of cardamom released from Cardamom Research Station Pampadumpara in 1991 and primary and secondary nurseries were raised. Seedlings attaining tiller development stage from secondary nurseries were planted in the main field. A bold capsuled cardamom clone (>7 mm) christened as PV 2 was identified from the seedling progenies and included in the Comparative Yield Trial (CYT). CYT was laid out during 1996 in RBD with three replications comprising of twelve high yielding cardamom clones at including two checks namely ruling variety - *Green Gold* and PV 1 at a spacing of 3m × 3m. Yield data were recorded for three yielding seasons (1999, 2000 and 2001) and the pooled data were utilized for analysis.

Among the twelve entries evaluated in the comparative yield trial, PV 2 recorded highest dry yield consistently for three years than that of other accessions (Table 1). However the highest dry yield was recorded in *Green Gold* in the first year of yielding which was on par with PV 2. From second year onwards, PV 2 excelled and recorded the highest dry yield than the other bold capsuled accessions including checks.

The distinguishing morphological features of the variety PV 2 are long bold capsules and long panicle with higher intenodal length. The dried capsules are ovoid to ellipsoid in shape with parrot green colour. The data indicated that PV 2 is superior in yield over the *Green Gold* and PV 1 to the tune of 8.01% and 75.82%, respectively. High dry recovery of 23.8% was recorded owing to thin capsule rind and low water content of the capsules. The width of the capsule was 7.8 mm, that increased by 4% and 21.88%, over *Green Gold* and PV 1, respectively. Number of dried capsules per kg is only 3420 in PV 2, which is comparatively lower than *Green Gold* (4000) and PV 1 (5280) attributing maximum litre weight of the dried capsules. Moreover, other characteristic features such as volume of 100 capsules (109.75cc), percentage of capsules >7mm (80.76) and 100 capsule weight (38.1 g) confirm the boldness of the capsule of PV 2.

Table 1. Yield data of comparative yield trial of cardamom accessions over three years

Entries	Dry yield (Kg ha^{-1})		
	1998-1999	1999-2000	2000-2001
PS 16	80.50	385.00	298.00
PS 1	70.80	322.00	527.80
PS 12	218.25	378.70	425.60
PS 21	136.25	518.50	458.20
PS 6	179.91	348.30	378.25
PV 2	680.20	970.00	1100.50
PS 9	136.55	423.70	346.70
PS 10	180.05	479.90	308.60
PS 29	131.15	308.90	403.50
PS 31	382.75	574.40	877.25
Green Gold	689.48	873.20	982.80
PV 1	403.00	500.00	660.45
CD (P = 5%)	43.80	50.34	26.60

Preliminary studies on reaction to major pests and diseases revealed that, PV 2 is relatively tolerant to thrips, shoot and capsule borer, capsule rot and clump rot as compared to *Green Gold*. Among the three accessions observed, the least damage due to thrips infestation was observed in PV 2 (16.2%) and

Table 2. Important characters of cardamom variety PV 2 as compared with the check *Green gold* and PV 1

Character	PV 2	Check varieties		% increase over	
		Green Gold	PV 1	Green Gold	PV 1
Dry yield (kg ha^{-1})	916.00	848.00	521.00	8.01	75.82
Dry recovery (%)	23.80	19.30	21.00	23.32	13.33
Length of capsule (mm)	20.50	18.80	21.80	9.04	–5.96
Width of capsule (mm)	7.80	7.50	6.40	4.00	21.88
% of capsules >7mm	80.76	75.30	0.00	7.25	-
No. of seeds per capsule	26.00	26.00	22.00	0.00	18.18
No. of dried capsules per kg	3420.00	4000.00	5280.00	–14.50	–35.23
Volume of 100 capsules (cc)	109.75	92.42	60.00	18.75	82.92
Thrips infected capsules (%)	16.20	32.40	22.80	–50.00	–28.95
Borer infected capsules (%)	3.56	9.56	1.71	–62.76	108.19
Capsule rot (%)	1.60	19.75	19.86	–18.98	–19.44
Clump rot (%)	1.50	4.00	1.75	–62.50	–92.45
Volatile oil (%)	6.60	7.10	7.10	–7.04	–7.04
α-terpeniylacetate (%)	37.20	32.00	33.20	16.25	12.05
1,8 cineole (%)	25.00	28.00	26.20	–10.71	–4.58
α-terpeniylacetate/1, 8 cineole	1.48	1.14	1.28	29.82	15.63

highest in *Green Gold* (32.4%). A two fold increase in thrips damage was observed in *Green Gold* than that of PV 2. The capsule borer infestation was found to be lowest in PV-1 (1.71%) compared to that of PV 2 and *Green Gold*. The disease incidence on capsules and clumps was least in PV 2 as compared to PV 1 and *Green Gold*. The incidence was recorded as 1.6 % on capsules and 1.5% on clumps in PV 2.

The volatile oil content of PV 2 was 6.6 % in comparison to 7.1 % in PV 1 and *Green Gold*. The flavour quality of cardamom oil is mainly determined by α-terpeniylacetate and 1-8 cineole, which impart sweet flavour and a harsh camphory note of the oil respectively. Despite the major components of volatile oil like α-terpeniylacetate and 1-8 cineole varied among these varieties, the ratio of which was found to be higher (1.48%) in PV 2 than the checks *viz.*, PV 1 (1.28%) and *Green Gold* (1.14%). Higher ratio of α-terpeniylacetate to 1-8 cineole is considered as a desirable trait in the assessment of good quality essential oil [2]. This variety PV 2 has been recommended for Cardamom Hill Reserves of Idukki district of Kerala in XVI biennial AICRP on Spices workshop and 21st State Seed Sub-Committee, Kerala [3]. Hence, the new cardamom variety PV 2 is expected to enhance the cost benefit ratio and export value of clean cardamom owing to its superb yield potential, capsule boldness, high quality oil content and tolerance to biotic stresses.

References

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