

Evaluation of cardamom (*Elettaria cardamomum* Maton) germplasm

N Miniraj¹, M Murugan & Carmel Rani Joseph

Cardamom Research Station

Pampadumpara, Idukki - 685 556, Kerala, India.

Received 22 July 1999; Revised 13 December 1999; Accepted 28 January 2000.

Abstract

Seventy two cardamom (*Elettaria cardamomum*) accessions were evaluated for 5 years at Pampadumpara (Kerala, India) for vegetative and economic characters and susceptibility to insect pests. Nine accessions recorded a dry capsule yield of above 150 g per clump. Among these nine promising accessions, S-1 appeared to be the best for further breeding programmes in view of its higher yield, moderate incidence of insect pests and higher quality parameters compared to other entries. Accessions MBP (Multiple Branching Panicle) and CP (Compound Panicle) can also be used in breeding programmes in view of their higher yield potential. The entries PS-12 and PS-5 offer great scope in breeding for quality.

Key words: cardamom, *Elettaria cardamomum*, evaluation, germplasm.

Cardamom (*Elettaria cardamomum* Maton), originated in the Western Ghat region of South India and considerable variability exists with respect to vegetative characters and yield, quality and tolerance to shade, drought, pests and diseases. A germplasm collection of cardamom is being maintained at Cardamom Research Station, Pampadumpara (Kerala, India). This paper describes the result of evaluation of these germplasm collections for various attributes.

The germplasm collection consisting of 72 accessions were planted in 1990. In each accession there were 12 plants. All the cultural operations were carried out as per the package of practice recommendations of Kerala Agricultural University. Observations with respect to vegetative and economic characters were recorded for five consecutive years. All the entries were described based on the IBPGR descriptor for cardamom. Attributes such as wet weight of capsules, number of seeds per capsule, dry weight of capsules and thrips (*Sciothrips cardamomi* Ramk.) and shoot and capsule borer (*Conogethes punctiferalis* Guen.) infestation were recorded at harvest. After curing, the samples were analyzed for quality (volatile oil and oleoresin) as described by ASTA (1985). The pooled yield data were subjected to statistical analysis for finding out the consistency in yield

over years. Susceptibility of the varieties to thrips and shoot and capsule borer was statistically arrived by Duncan's Multiple Range Test.

Nine accessions recorded higher yield than the grand mean (Table 1). Among them, MBP recorded the highest wet and dry yield of 1050.5 g and 243.1 g plant⁻¹, respectively, while Clone-57 registered the lowest yield of 250.8 g and 159.2 g plant⁻¹, respectively. The accession CP was second with respect to wet yield whereas S-1 stood second with respect to dry yield of capsules. But the consistency of the varieties MBP and CP as expressed by the coefficient of variation was poor (79.0% and 100.6%, respectively). However, S-1 recorded a very high degree of consistency in yield over years (37.0%). The number of seeds/capsule in S-1 was higher compared to MBP and CP and this could be the reason for the increased dry yield. High wet yield of MBP and CP was due to the branching nature of the panicles and the resultant increase in number of capsules per panicle.

Thrips infestation on the capsules ranged from 0.71% to 1.62% in various accessions but were statistically on par. Shoot and capsule borer infestation ranged from 1.40% to 3.04% in these accessions and were also not statistically different

¹College of Horticulture, Kerala Agricultural University, Vellanikkara - 680 656, Kerala, India.

Table 1. Evaluation of cardamom germplasm (1994–1999)

Type/Accession	Wet weight (g plant ⁻¹)	Dry weight (g plant ⁻¹)	CV%	Volatile oil % (V/W)	Oleoresin % (V/W)	Capsule borer (%)*	Thrips (%)	No. of seeds capsule ⁻¹	Nature of capsule
MBP	1050.1	243.1	79.0	6.2	10.0	3.04 ^{ab}	1.32	11.8	Oblong bold
CP	884.9	194.8	100.6	7.3	10.0	1.40 ^a	1.62	14.7	Round bold
Veeraputhran	613.1	192.5	71.0	7.3	10.5	2.76 ^{ab}	0.71	14.8	Oblong bold
S-1	517.0	212.7	37.0	7.8	11.6	2.43 ^{ab}	1.00	17.3	Oblong bold
PS-9	443.4	166.9	58.0	7.0	10.8	2.32 ^{ab}	1.40	15.6	Oblong medium
PS-4	375.2	152.1	52.0	7.3	10.2	2.02 ^{ab}	0.71	14.8	Oblong bold
PS-5	372.9	175.1	50.0	8.4	11.4	2.78 ^{ab}	0.88	16.4	Oblong bold
PS-12	282.7	157.7	39.0	8.4	11.6	2.89 ^{ab}	1.17	20.3	Round bold
Clone-57	250.8	159.2	30.0	7.0	10.3	1.84 ^{ab}	1.35	14.9	Round medium
CD (P<0.05)	-	-	-	-	-	1.69	NS	-	-

*Means followed by the same letter are not significantly different in DMRT

from each other.

Quality of the capsules as expressed by the content of volatile oil and oleoresin also varied among the accessions. PS-5 and PS-12 recorded highest volatile oil and oleoresin contents.

Among the nine accessions, S-1 appeared to be the best for further breeding programmes in view of its moderate yield with very good consistency and quality compared to others. It is a bold capsule type and insect pest infestation was also moderate on this accession. MBP and CP were also promising for yield and PS-12 and PS-5 for quality and

these could be used in future breeding programmes for yield and quality improvement.

Acknowledgement

The authors acknowledge the financial support rendered by the Indian Council for Agricultural Research, New Delhi, for conducting these studies.

Reference

American Spice Trade Association (ASTA) 1985 Official Analytical Methods of the American Spice Trade Association, 3 Edn. New Jersey.