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Breeding potential of *Pentalonia nigronervosa* f. *caladii* Van der Goot (Homoptera: Aphididae) on *katte* escape cardamom (*Elettaria cardamomum* Maton) plants

M N VENUGOPAL, M J MATHEW & M ANANDARAJ[1]

Indian Institute of Spices Research
Cardamom Research Centre
Appangala, Madikeri - 571 201, Karnataka, India.

Abstract

Two viral diseases of cardamom (*Elettaria cardamomum*) namely, mosaic or *katte* disease and vein clearing or *kokke kandu* disease are transmitted by the cardamom aphid, *Pentalonia nigronervosa* f. *caladii*. The breeding potential of this vector on 17 mosaic disease escape accessions of cardamom was compared with those of a local susceptible check. The aphids colonised and multiplied on all test accessions at a rate of multiplication ranging from 1.77 to 3.93, on the 5th day after introduction. On the 10th day after introduction, the local check recorded the highest multiplication rate (5.88) followed by NKE-5 (5.63); NKE-27 recorded the lowest rate of multiplication (2.31). Colonisation of aphids on all *katte* escape lines indicates that the resistance of cardamom accessions to *katte* virus is not due to deterrence to vector but due to some other host factors.

Key words : breeding potential, cardamom, cardamom aphid, *Elettaria cardamomum*, mosaic disease, *Pentalonia nigronervosa* f. *caladii*.

Abbreviation

NKE = Natural *katte* escape

Among the major diseases of cardamom (*Elettaria cardamomum* Maton), mosaic or *katte* disease and vein clearing or *kokke kandu* disease are serious causing severe economic losses (Sarma *et al.* 1994; Venugopal 1995). The cardamom aphid, *Pentalonia nigronervosa* f. *caladii* Van der Goot (Homoptera : Aphididae) transmits both the diseases. As a part of disease management strategy, mosaic escape lines have been identified and evaluated for various growth, yield and quality parameters. Studies on the possible mechanisms of resistance in

[1]Indian Institute of Spices Research, Post Box No. 1701, Marikunnu P. O., Calicut - 673 012, Kerala, India.

these accessions are in progress. Resistance to virus may be due to various mechanisms like deterrence to vector settling, feeding and breeding, delay in symptom expression or inhibition of virus multiplication (Fraser 1990). This study was aimed at determining the breeding potential of *P. nigronervosa* on 17 mosaic escape accessions of cardamom along with a local check in the laboratory. The disease escape accessions have been collected from hot spots of the disease in South India and are being maintained in the experimental farm of Indian Institute of Spices Research, Cardamom Research Centre, Appangala, Karnataka (IISR 1996).

Two terminal cardamom leaves were rolled so as to form a funnel shaped structure and pre-starved apterate adult aphids were introduced into each leaf funnel @ 25 per leaf funnel in three replicates. Settling and feeding behaviour of aphids were recorded after release of aphids. Population counts were taken on the 5th and 10th day after introduction. From these values, the mean rate of population growth was computed and subjected to analysis of variance.

Immediately after release, the aphids settled on the concealed parts of the leaf funnel and started feeding in all the test accessions. The usual deterrence behaviour of aphid like waving of antennae and wandering (Mathew *et al.* 1997) was not observed in any of the accessions under the trial. The rate of multiplication of cardamom aphid on various NKE accessions varied from 1.77 (NKE-27) to 3.93 (NKE-5) which was higher than in control (3.57), on the 5th day after introduction (Table 1). On the 10th day after introduction, the population growth rate was highest in control (5.88) while in the NKE accessions, it varied between 2.31 (NKE-27) and 5.63 (NKE-5). Colonisation was relatively less in some of the mosaic escape accessions tested. Cardamom mosaic virus is a non-persistent virus (Verma & Capoor 1958) and simple probing and feeding of vector for a brief period is sufficient to transmit the virus in the susceptible host. In this experiment, although the breeding potential

Table 1. Breeding potential of cardamom aphid on *katte* escape cardamom accessions

Accession	Rate of aphid multiplication after release	
	On 5th day	On 10th day
NKE-3	2.72	4.23
NKE-4	2.36	3.61
NKE-5	3.93	5.63
NKE-8	3.39	4.32
NKE-9	2.29	3.47
NKE-11	2.13	2.51
NKE-12	2.37	3.20
NKE-19	2.11	3.07
NKE-26	2.92	4.20
NKE-27	1.77	2.31
NKE-28	2.08	3.19
NKE-31	2.35	4.95
NKE-32	2.64	4.52
NKE-34	3.77	5.19
NKE-71	1.93	3.77
NKE-72	2.37	4.25
NKE-78	2.39	2.65
Control	3.57	5.88
SEm±	0.34	0.62
CD (P=0.05)	0.15	0.25
F Test	**	**

** Siginificant at 1% level

varied in different accessions, there was no feeding deterrence with any of them. It is concluded that the resistance to mosaic in the test lines for expressing disease symptoms is not due to the deterrence of the accessions to the vector from feeding, but due to some other host factors.

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