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Vinutha B
University of Horticultural Sciences, Bagalkot, Karnataka, India

YK Kotikal
University of Horticultural Sciences, Bagalkot, Karnataka, India

Shankar Meti
University of Horticultural Sciences, Bagalkot, Karnataka, India

Correspondence
Vinutha B
University of Horticultural Sciences, Bagalkot, Karnataka, India

Screening of selected oriental pickling melon, *Cucumis melo* var. *conomon* lines against fruit fly and red pumpkin beetle

Vinutha B, YK Kotikal and Shankar Meti

Abstract
The study was conducted on screening of oriental pickling melon, *Cucumis melo* var. *conomon* genotypes against fruit fly and red pumpkin beetle. The results revealed that least infestation of fruit fly was recorded in genotypes Sirsi local (42.3%) and BCMCO-02 (42.7%) which were on par with GR-3-1 (42.9%), Mysore local (44.0%), Soubhagya (44.3%), BCMCO-01 (44.0%), Koppa Local (44.5%), Mangalore Local (46.4%), BCMSO-03 (46.6%). The highest infestation was found in the case of Sirsi-2-13 (68.1%) followed by Sirsi-1-13 (63.8%) which was on par with BCMSO-04 (61.3%) and BCMR-1 (59.6%). All the genotypes, GR-3, Tattisara, GR-3-1, GR-4-1 and GR-2-1, BCMCO-02, GR-1-1, Sirsi Local, BCMSO-03 and BCMR-01 were on par with each other against red pumpkin beetle.

Keywords: Oriental pickling melon, fruit fly, red pumpkin beetle, genotypes

1. Introduction
Oriental pickling melon (*Cucumis melo* var. *conomon*) is one of the vegetables of melon group belonging to the family Cucurbitaceae, with a chromosomal number 2n=24 (Munshi and Alvarez, 2005) [9]. It is popularly called as golden melon or culinary melon in English. In Karnataka it is called by various local names like *sambar southe or Mangalore southe*. It is an ideal summer vegetable crop chiefly grown for use as a fresh vegetable, in preparation of curry and for pickling. It has small fruit with smooth tender skin, white flesh usually with little sweetness and odour. The fruits, which contain moderate amount of vitamins and minerals, are used in an array of traditional vegetarian dishes like chutney, curry, sambar and pickles. The fruits possess cooling properties and are used as a skin moisturizer and as a digestive agent (George, 2008) [5].

The extent of yield loss caused by the pest in cucurbitaceous vegetables ranged from 30 to 100 percent depending upon species and the season in different parts of the world (Dhillon *et al.*, 2005) [4]. Like other cucurbits, Oriental pickling melon is also subjected to damage by wide array of insect pests right from the initial stages of the crop growth to harvesting stage. As this vegetable also belongs to the same family, Cucurbitaceae, having identical cultural requirements and almost suffers due to same diseases and insect pests like in other members of cucurbitaceous vegetables. Melon fruit fly (*Bactrocera cucurbitae* Coq.) is an important insect pest of cucurbitaceous crops (Choudhary *et al.*, 2012) [3]. Due to melon fruit fly infestation, 73.83 percent damage was reported from cucumber crop (Krishna Kumar *et al.*, 2006) [8]. The red pumpkin beetle, (*Aulacophora foveicollis* Lucas) is also a serious pest of cucurbits, may cause up to 70 percent damage to leaves and 60 percent damage to flowers of cucumbers (Khan *et al*., 2012) [7]. In West Bengal, epilachna beetle, (*Henosepilachna septima* Dieke), leaf roller, green semilooper, aphids, white fly etc. were also found to be destructive pest on cucurbits (Barma and Jha, 2013; Barma and Jha, 2011 and Jha, 2008 etc) [1, 2, 6]. From these reports, it is evident that the attack of these insect pests is a key factor in reducing the quality of the oriental pickling melon.

2. Material and methods
A field experiment was conducted at the experimental block of the Department of Vegetable Science, College of Horticulture, UHS, Bagalkot (Karnataka). Bagalkot is situated in the Northern Dry Zone (Zone 3) of Karnataka, located at 75^0 36' East longitude and 16^0 09' North latitude and at an altitude of 536.75 m above Mean Sea Level (MSL).

The screening was done against Fruit fly, *Bactocera cucurbitae* (Coquillett), Red pumpkin beetle, *Aulacophora foveicophora* (Lucas)**.** The experiment was laid out in a randomized block design with two replications of each genotype. The spacing between rows and the plants was 2m and 1m respectively. All the plants were raised in field following recommended package of practices of UHS, Bagalkot. The genotypes used for the study given (Table 1)
The experimental material for the study comprised of twenty-four genotypes collected from College of Horticulture, Bagalkot, Seed collection unit. The lists of the material used are given in Table 1.

Table 1: Details of genotypes

Sl. No.	Genotypes	Source
1	Sirsi Local	COH, Bagalkot
2	BCMCO-01	COH, Bagalkot
3	BCMCO-02	COH, Bagalkot
4	BCMR-01	COH, Bagalkot
5	BCMSO-03	COH, Bagalkot
6	BCMSO-04	COH, Bagalkot
7	Tattisara	COH, Bagalkot
8	Mudicode	COH, Bagalkot
9	GR-1	COH, Bagalkot
10	GR-2	COH, Bagalkot
11	GR-3	COH, Bagalkot
12	GR-3-1	COH, Bagalkot
13	GR-4-1	COH, Bagalkot
14	GR-2-1	COH, Bagalkot
15	GR-1-1	COH, Bagalkot
16	GR-2-1	COH, Bagalkot
17	Sirsi-1-13	COH, Bagalkot
18	Sirsi-2-13	COH, Bagalkot
19	Thirthalli Local	COH, Bagalkot
20	Mangalore Local	COH, Bagalkot
21	Soubhagya	COH, Bagalkot
22	Koppa Local	COH, Bagalkot
23	Mysore Local	COH, Bagalkot
24	Udupi Local	COH, Bagalkot

2.1 Fruit fly incidence

The observations for fruit fly infestation was taken from each genotype after each picking. At weekly intervals, the entire marketable size fruits irrespective of healthy and infested fruits were plucked separately from five randomly selected plants from each treatment (genotype) and number of infested and healthy fruits were sorted out to calculate the percent fruit infestation as follows.

$$\text{Percent fruit infestation} = \frac{\text{Number of infested fruits}}{\text{Total number of fruits}} \times 100$$

The genotypes were grouped by following the rating system, given by Nath (1966)[10] for the fruit damage as – immune (no damage), highly resistant (1–10 percent damage), resistant (11–20 percent damage), moderately resistant (21–50 percent damage), susceptible (51–75 percent damage) and highly susceptible (76–100 percent damage).

2.2 Red pumpkin beetle

The plants were kept under constant supervision, from seedling stage for appearance of the pest. The observations were recorded on the basis of number of beetles at weekly intervals on five randomly selected plants from each variety/genotype. The population of adult beetles was recorded on visual basis in the morning hours when beetles were less active. In the beginning (seedling stage) all the leaves were observed for infestation. Whereas, at later crop growth stage, leaves were selected randomly from terminal, middle and lower portion of each plant and beetles were counted to calculate average number of beetles per vine.

3. Results and Discussion

3.1 Fruit fly: The data (Table 2) shows the percent fruit fly infested fruits, where in genotypes Sirsi local (42.3%) recorded significantly least infested fruits followed by BCMCO-02 (42.7%) which was on par with GR-3-1 (42.9%), Mysore local (44.0%), Soubhagya (44.3%), BCMCO-01 (44.0%), Koppa Local (44.5%), Mangalore Local (46.4%), BCMSO-03 (46.6%) and the highest infestation was found in the case of Sirsi-2-13 (68.1%) followed by Sirsi-1-13 (63.8%) which was on par with BCMSO-04 (61.3%) and BCMR-1 (59.6%). The grouping of the genotypes according to the screening results is given in table 3.

3.2 Beetles: The infestation of pumpkin beetles on genotypes was studied by counting number of beetles per vine. The infestation of beetles did not vary significantly between genotypes. All the genotypes, GR-3, Tattisara, GR-3-1, GR-4-1 and GR-2-1, BCMCO-02, GR-1-1, Sirsi Local, BCMSO-03 and BCMR-01 were on par with each other. The number of beetles per leaf per vine was assessed during cropping season at 7 days intervals. There was no significant variation in the mean number of beetles per vine across genotypes and between the mean of interaction of genotypes and pest, as presented in Table 4. The mean number of beetles per vine was found to be non significant for the genotypes. All the genotypes were found on par with each other.

4. Conclusion

As seen from the data in the table, the percent fruit fly infested fruits in Sirsi local (42.3%) was significantly least, followed by BCMCO-02 (42.7%) which was on par with GR-3-1, Mysore local, Soubhagya, BCMCO-01, Koppa Local, Mangalore Local and BCMSO-03 with 42.9, 44.0, 44.3, 44.0, 44.5, 46.4 and 46.6 percent respectively and the highest infestation was found in the case of Sirsi-2-13 (68.1%) followed Sirsi-1-13 (63.8%) which was on par with BCMSO-04 (61.3%) and BCMR-1 (59.6%) fig., 1.
The infestation of beetles on genotypes was studied by counting number of beetles per vine. The infestation of beetles did not vary significantly between genotypes. All the genotypes, GR-3, Tattisara, GR-3-1, GR-4-1 and GR-2-1, BCMCO-02, GR-1-1, Sirsi Local, BCMSO-03 and BCMR-01 were on par with each other (fig., 2).
It can be concluded that out of 24 germplasms/varities of oriental pickling melon screened against fruit fly and red pumpkin beetle, none was found completely free of infestation.

Table 2: Screening of selected genotypes of Oriental pickling melon against fruit fly

Sl. No.	Genotypes	Average Fruit fly incidence (%)
1	Sirsi Local	42.3(40.51) l
2	BCMCO-01	44.0(41.55) ijkl
3	BCMCO-02	42.7(40.80) kl
4	BCMR-01	47.2(43.42) ijk
5	BCMSO-03	46.6(43.05) ijkl
6	BCMSO-04	61.3(51.58) bc
7	Tattisara	53.9(47.26) ef
8	Mudicode	54.2(47.41) ef
9	GR-1	55.3(48.04) def
10	GR-2	47.9(43.80) hij
11	GR-3	55.5(48.17) def
12	GR-3-1	42.9(40.92) jkl
13	GR-4-1	59.6(50.56) bcd
14	GR-2-1	59.6(50.56) bcd
15	GR-1-1	53.0(46.75) fg
16	GR-2-1	58.3(49.78) cde
17	Sirsi-1-13	63.8(53.05) ab
18	Sirsi-2-13	68.1(55.64) a
19	Thirthalli Local	54.4(47.55) ef
20	Mangalore Local	46.4(42.94) ijkl
21	Soubhagya	44.3(41.73) ijkl
22	Koppa Local	44.5(41.84) ijkl
23	Mysore Local	44.0(41.55) ijkl
24	Udupi Local	52.5(46.46) fgh
S. Em±		0.5
CD= (0.05)		1.49

Values in the parentheses are Arc sin transformed values

Table 3: The grouping of oriental pickling melon genotypes based on reaction of fruits to the fruit fly infestation following Nath (1966)

Sl. no.	Groups based on reaction to the fruit fly infestation	Percent fruit infestation	Genotypes	Number
1	Moderately resisitant	42.3 to 47.9	Sirsi local, BCMCO-01, BCMCO-02, BCMR-01, BCMSO-03, GR-2, GR-3-1, Mangalore local, Soubhagya, Koppa local, Mysore local	11
2	Susceptible	52.5 to 68.1	BCMSO-04, Tattisara, Mudicode, GR-1, GR-3, GR-4-1,GR-1-1, GR-2-1, Sirsi-1-13, Sirsi-2-13, Thirthalli local, Udupi local	13
Total				24

Table 4: The distribution of pests per vine across the genotypes of Oriental pickling melon, COH, Bagalkot

Sl.no.	Genotypes	*Mean of two replications
		Beetles/ vine
1	Sirsi Local	0.72 (1.29)de
2	BCMCO-01	0.80 (1.36)bc
3	BCMCO-02	0.80(1.37) ab
4	BCMR-01	0.82(1.36)bc
5	BCMSO-03	0.82(1.30)
6	BCMSO-04	0.80(1.37)b
7	Tattisara	0.90(1.38)ab
8	Mudicode	0.80(1.30) de
9	GR-1	0.80(1.32)cd
10	GR-2	0.76(1.29)de
11	GR-3	0.64(1.28)de
12	GR-3-1	0.84(1.36)b
13	GR-4-1	0.90(1.36)b
14	GR-2-1	0.60(1.27)e
15	GR-1-1	0.80(1.36)bc
16	GR-2-1	0.80(1.30)de
17	Sirsi-1-13	0.80(1.36)bc
18	Sirsi-2-13	0.84(1.37)b
19	Thirthalli Local	0.66(1.28)de
20	Mangalore Local	3.7(2.15)ab
21	Soubhagya	2.7(1.91)efgh
22	Koppa Local	2.8(1.94)defg
23	Mysore Local	2.6(1.94)defg
24	Udupi Local	2.4(1.83)fgh
SEM±		0.26
CD (0.05%)		0.77

*Mean of two replications

**Values within parentheses are $\sqrt{(x+1)}$ transformations

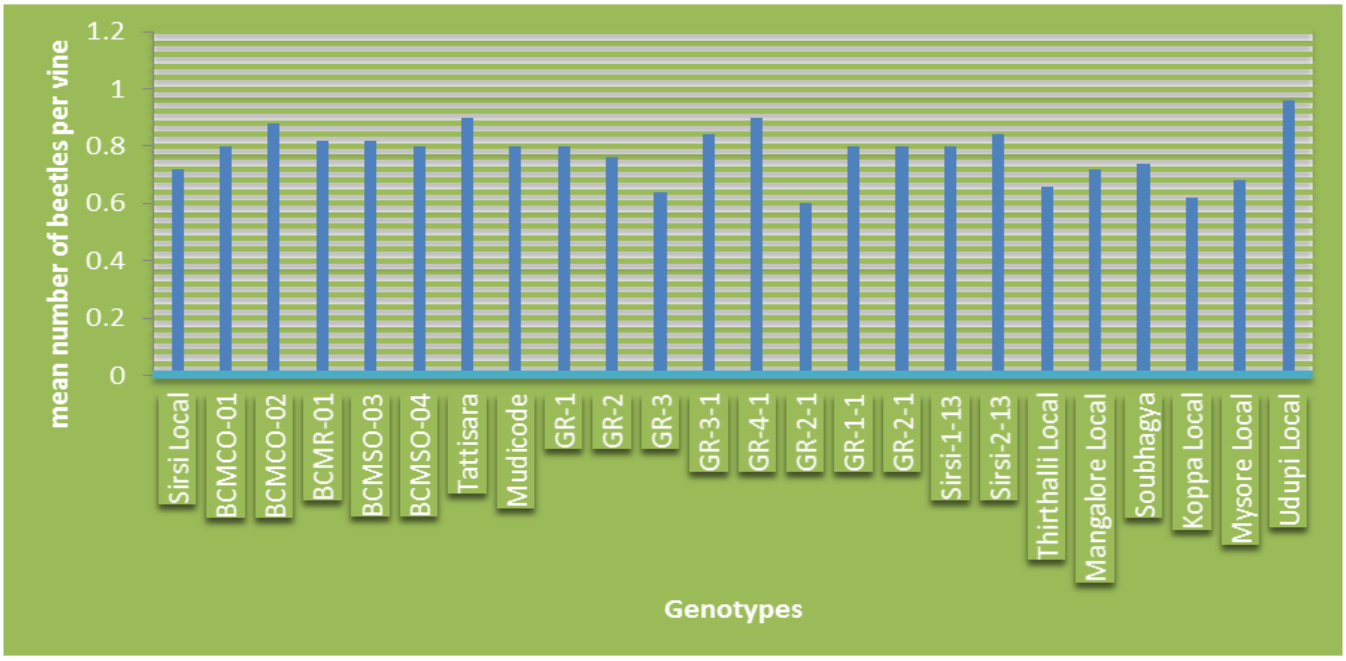

Fig 1: Number of beetles per vine against the genotypes during the cropping period (2015)

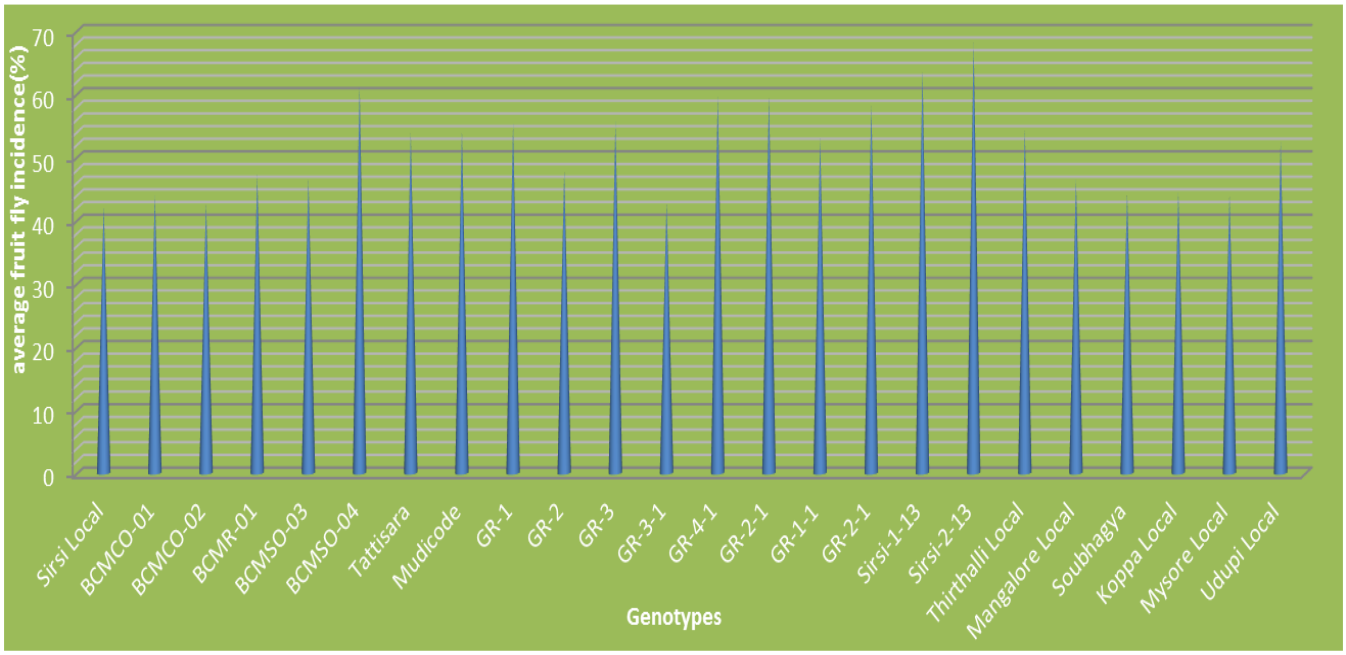

Fig 2: Percent infestation of different genotypes against fruit fly

References

1. Barma P, Jha, S. Biology, seasonal activity of fruit fly (*Bactrocera cucurbitae* Coq.) on pointed gourd (*Trichosanthes dioica* Roxb.) and weather relations Journal of Plant Protection Sciences. 2011; 3(1):48-53.
2. Barma, P., Jha, S. Insect and non insect pests infesting pointed gourd (*Trichosanthes dioica* Roxb.) in West Bengal. The Bioscan. 2013; 8(2):537-543.
3. Choudhary FK, Patel GM. Effect of abiotic factors on population fluctuation of melon fly, *Bactrocera cucurbitae* Coquillett. Life Science Leaflets. 2012, 365-369.
4. Dhillon MK, Singh R, Naresh J, Sharma HC. The melon fly, *Bactrocera cucurbitae*: A review of its biology and management. Journal of Insect Science. 2005; 5:40.
5. George, T.E. Kanivellari Visual treat, Kerala Calling Monthly. 2008; 3:36-37
6. Jha, S. Bio-ecology and management of fruit fly and Epilachna beetle in Bitter gourd. SAARC Journal of Agriculture. 2008; 6(1):11-27.
7. Khan MMH, Alam MZ, Rahman MM, Miah MIH, Hossain MM. Influence of weather factors on the incidence and distribution of pumpkin beetle infesting cucurbits. Bangladesh J Agril. Res. 2012; 37(2):361-367.
8. Krishna Kumar NK, Verghese A, Shivakumara B, Krishnamoorthy PN, Ranganath HR. Fruit Flies of Economic Importance. From basic to applied knowledge. In Proceedings of the 7th International Symposium on Fruit Flies of Ecological Impact, Salvador, Brazil, 2006, 249-253.
9. Munshi AD, Alvarez JM. Hybrid melon development. Journal of new seeds. 2005; 6(4):321-360.
10. Nath P. Varietal resistance of gourds to the fruit fly. Indian Journal of Horticulture. 1966; 23(2):69-77.