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Screening of bitter gourd genotypes against infestation of fruit fly (*Bactrocera Cucurbitae* Coquillett.)

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Abstract
An experiment was conducted during *Kharif* season 2014 at the Department of Vegetable Science, College of Agriculture, OUAT, Bhubaneswar, to work out the varietal resistance of bitter gourd (*Momordica charantia* L.) against the melon fruit fly (*Bactrocera cucurbitae* Coquillett.) infestation under natural epiphytotic condition. The experiment results of varietal resistance trial showed that Thusi with (11.05%) fruit infestation was found to be least susceptible to the melon fruit fly attack followed by Improved Katahi (11.26%), Preethi (13.31%), Phule Green Gold (14.88%) and Hirkani (15.24%). The variety of Pusa Aushadhi was found to be most susceptible to this fruit fly having (77.59%) fruit infestation followed by Arka Harit (77.42%) and NDUAT-3 (76.83%). No one of the genotypes was found Immune and highly resistance, out of 23 genotypes three were found to be susceptible as well as highly susceptible, eleven were moderately resistance and six were resistance.

Keywords: Bitter Gourd, Fruit fly and Genotypes

1. Introduction
Bitter Gourd [*Momordica charantia* L.] is an important tender tropical vegetable but grown as an annual. They are a delicious fruit, climbing vines with palmately lobed monoecious flowers. The immature fruit of bitter gourd is valued for its bitter flavour, considered to bring out the flavour in other ingredients. It's frequently eaten fresh however can also be pickled, and has been canned in brine. Its young leaves, as well as shoots, are also eaten (Vinning, 1995) [7]. Extracts of bitter gourd possess anti-viral, anti-microbial, antioxidant, antiulcerogenic, and antihepatotoxic properties while also having the power to reduce blood sugar (Raman and Lan, 1996) [6]. Balsam pear fruits are used to curing rheumatism, asthma, blood diseases, and diabetes. Naturopaths recommended drinking of fresh bitter gourd juice. Tropical Asia, especially Indo Burma region is native of bitter cucumber. It is widely cultivated in India, China, Malaysia, Indonesia as well as tropical Africa.
The most serious pest of cucurbits is fruit fly. Many pests attack bitter gourd but in India, fruit flies are the major serious pest of this crop. Fruit fly which limits bitter gourd productivity in all India's growing areas. The scale of losses ranges between 30-100% depending on the season and species of cucurbit (Panday *et al.*, 2009) [4]. The adult fly oviposit 2 to 4 mm inside the fruit skin and after hatching the maggots start to feed developing fruits. It is problematic to manage this pest with insecticides, as the maggots internally damage the fruits. Hence, the eco-friendly management of this pest is required. The creation of fruit fly resistant genotypes/ varieties is an essential component of IPM. Therefore a study to test genotypes promising against fruit fly under natural field infestation was undertaken.

2. Materials and methods
The study "Screening of bitter gourd genotypes against Infestation of fruit fly (*Bactrocera Cucurbitae* Coquillett.)" was conducted at the Department of Vegetable Science, College of Agriculture, OUAT, Bhubaneswar during 2014, *Kharif* season. The material for the present investigation consisted of 23 diverse genotypes. The experiment was laid out with three replications in the RBD. In each replication, each treatment was represented by two rows each accommodating 10 plants at a row to row and plant to plant spacing of 2.0 m and 1.0 m,

respectively. For each genotype five plants were randomly selected and evaluated from each replication. Based on per cent fruit infestation, the resistance/susceptibility for individual lines was assessed. The cumulative per cent infestation of fruits was formulated based on the total number of fruit from all the picking as shown below:

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

The fruit fly percent (%) incidence under natural epiphytotic conditions was calculated as per the procedure given by Nath (1966).

Table 1: Susceptibility rating scale based on fruit damage per cent

Fruit damage (%)	Rating
No fruit damage	Immune (I)
1 – 10% fruit damage	Highly Resistance (HR)
11 – 20% fruit damage	Resistance (R)
21 – 50% fruit damage	Moderately Resistance (MR)
51 – 75% fruit damage	Susceptible (S)
76 – 100% fruit damage	Highly Susceptible (HS)

3. Results and discussion

Table 2 presents the comparative reaction of various bitter gourd genotypes to the infestation of fruit fly. There was significant variation among the genotypes for fruit infestation percent. The fruit fly infestation recorded as the percentage of infested fruits was ranged from 11.05 to 77.59 per cent and 36.46 per cent of the overall mean infestation of fruits was recorded. The lowest (11.05%) incidence of fruit fly infestation was recorded in Thusi followed by Improved Katahi (11.26%), Preethi (13.31%), Phule Green Gold (14.88%) and Hirkani (15.24%), Whereas, high incidence of fruit fly has been recorded in Pusa Aushadhi (77.59%), Arka Harit (77.42%), NDUAT-3 (76.83%), IIVR-4 (58.01%) and Pusa Vishesh (55.58%).

The bitter gourd genotypes based on percent fruit infestation, grouped into different categories, showed that none of the screened genotypes were found to be immune and highly resistant. Only six genotypes *i.e.* Preethi, CO-1, Phule Green Gold, Thusi, Improved Katahi, Hirkani, were found resistant showing melon fruit fly infestation in the range of 11- 20 percent. Eleven genotypes included in the moderately resistant category (21-50%). Three genotypes Pusa Do Mausami, Pusa Vishesh, IIVR-4 were found susceptible and three genotypes Arka Harit, Pusa Aushadhi, NDUAT-3 as highly susceptible. The findings of the study are presented in Tables 2 and 3 are similar to the studies of Harika *et al.* (2012) [2], Panday *et al.* (2012) [5], Haldhar *et al.* (2015) [1]. The fruit fly infestation is affected by various environmental factors such as temperature, relative humidity. The resistance is dominant over susceptibility in all the cucurbits. The resistance may be due to genotype morphological as well as biochemical properties.

Table 2: Per cent fruit fly incidence in different bitter gourd genotypes

S. No.	Genotypes	Per cent fruit fly incidence	Reaction category
1.	Green Long	43.01 (40.99)	MR
2.	Arka Harit	77.42 (61.64)	HS
3.	Preethi	13.31 (21.41)	R
4.	Pusa Do Mausami	53.38 (46.95)	S
5.	Pusa Vishesh	55.58 (48.21)	S
6.	Pusa Aushadhi	77.59 (61.75)	HS
7.	CO-1	19.81 (26.43)	R
8.	Phule Green Gold	14.88 (22.69)	R
9.	Meghana -1	23.23 (28.82)	MR
10.	Peta Kalara	37.13 (37.55)	MR
11.	Thusi	11.05 (19.42)	R
12.	NBR Noble Katahi	25.38 (30.25)	MR
13.	Improved Katahi	11.26 (19.61)	R
14.	Japani Green Kalara	28.17 (32.06)	MR
15.	IIVR-2	32.92 (35.02)	MR
16.	IIVR-4	58.01 (49.62)	S
17.	IIVR-5	46.29 (42.88)	MR
18.	NDUAT-3	76.83 (61.24)	HS
19.	Nakhara Local	26.23 (30.81)	MR
20.	BBG-5	35.32 (36.47)	MR
21.	Hirkani	15.24 (22.98)	R
22.	Samanta Goberta Green Long All Season	27.77 (31.81)	MR
23.	High Tech Meghana-2	28.80 (32.46)	MR
	CD at 5%	6.52	
	S. E m±	2.28	
	CV	10.84	

R: Resistant; MR: Moderately Resistant; MS: Moderately Susceptible; S: Susceptible; HS: Highly Susceptible

Table 3: Grouping of bitter gourd genotypes on the basis of percent fruit infestation

Reaction category	Number of genotypes	Genotypes (Per cent fruit fly incidence)
Highly Susceptible	3	Arka Harit, Pusa Aushadhi, NDUAT-3
Susceptible	3	Pusa Do Mausami, Pusa Vishesh, IIVR-4
Moderately Resistant	11	Green Long, Meghana -1, Peta Kalara, NBR Noble Katahi, Japani Green Kalara, IIVR-2, IIVR-5, Nakhara Local, BBG-5, Samanta Goberta Green Long All Season, High Tech Meghana-2
Resistant	6	Preethi, CO-1, Phule Green Gold, Thusi, Improved Katahi, Hirkani

4. References

1. Haldhar SM, Choudhary BR, Bhargava R, Gurjar K. Host plant resistance (HPR) traits of ridge gourd (*Luffa acutangula* (Roxb.) L. against melon fruit fly, (*Bactrocera cucurbitae* (Coquillett)) in hot arid region of India. Scientia Horticulturae. 2015; 194:168-174.
2. Harika M, Gasti VD, Kulkarni MS, Mulge R, Mastiholi AB, Shirol AM. Reaction of bottle gourd genotypes against fruit fly and downey mildew under natural epiphytotic conditions. Karnataka Journal of Agricultural Sciences. 2012; 25(2):296-297.
3. Nath P. Varietal resistance of gourds to the fruit flies. Indian Journal of Horticulture. 1966; 23(2):69-79.
4. Panday AK, Nath P, Rai AB, Kumar A. Screening of some bittergourd varieties/germplasms on the basis of some biological and biometrical parameters of melon fruit fly (*Bactrocera cucurbitae* Coquillett.). Vegetable Science. 2009**;** 36(3):399-400.
5. Panday AK, Nath P, Rai AB, Kumar A. Reaction of different bitter gourd genotypes against Infestation of fruit fly (*Bactrocera Cucurbitae* Coquillett.). Progressive Horticulture. 2012; 44(2):304-306.
6. Raman A, Lau C. Anti-diabetic properties and phytochemistry of *Momordica charantia* L. (Cucurbitaceae). Phytomedicine. 1996; 2(4):349-362.
7. Vinning, G. Market Compendium of Asian Vegetables. RIRDC Research paper No. 95/12. Canberra, Rural Industries Research and Development Corporation, 1995, 386.