

## RELATIVE PREFERENCE OF RED PUMPKIN BEETLE *AULACOPHORA (RAPHIDOPALPA) FOVEICOLLIS* (LUCAS) TO DIFFERENT CUCURBITS

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### ABSTRACT

Relative preference of red pumpkin beetle, *Aulacophora (Raphidopalpa) foveicollis* (Lucas) was studied on ten field grown cucurbits both at Udaipur and Jobner. Musk melon, long melon and pumpkin were the most preferred hosts, bottle gourd and ridge gourd were the preferred hosts and sponge gourd and cucumber were only moderately preferred. Bitter gourd, round gourd and water melon were non-preferred hosts.

### INTRODUCTION

Red pumpkin beetle, a serious pest of cucurbits in India attack mainly at the seedling stage and thus hamper successful cultivation of cucurbitaceous vegetables. Its relative preference of various cucurbits was evaluated under field conditions at Udaipur and Jobner.

### MATERIAL AND METHODS

The recommended varieties of ten cucurbits (Table 1) were grown in three replications each in *zaid* (February to June) on the farms of College of Agriculture in randomised block design to study the preference of red pumpkin beetle during 1979 and 1981 at Udaipur and 1980 and 1981 at Jobner. The seeds (2-3) were dibbled about 0.5 m apart on both sides of 0.7 m wide irrigation channel in between the plots measuring 5x4 m. Recommended agronomic practices were followed to raise a good and healthy crop.

Five plants in each replicate were selected to record the beetle population in morning hours (upto 8.0 AM) at weekly intervals until the crop was harvested. The crop was kept under constant observation after the appearance of cotyledonous leaves for the attack of beetles. However the damage on the young seedlings for the first week of observation was estimated by the rating system of Nath and Thakur (1965) with slight modification in the gradation figures which is as follows.

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Table 1. Red pumpkin beetle average damage grade score and host preference ranking of different cucurbits at seedling stage

Crop and cultivar	Udaipur				Jobner			
	1979		1981		1980		1981	
	Average DGS*	Rank	Average DGS*	Rank	Average DGS*	Rank	Average DGS*	Rank
Pumpkin 'Arka Suryamukhi'	3.47	I	3.33	I	2.80	II	2.47	II
Bottle gourd 'PSP long'	3.20	I	3.07	I	2.53	II	2.40	II
Ridge gourd 'Pusa nasdar'	3.27	I	2.93	II	2.73	II	2.13	II
Sponge gourd 'Pusa chikni'	2.67	II	2.60	II	2.13	II	2.07	II
Bitter gourd 'Pusa domousmi'	0.00	V	0.00	V	0.00	V	0.00	V
Long melon 'Lucknow'	4.00	I	3.93	I	3.73	I	3.73	I
Round gourd 'Arka tinda'	0.00	V	0.00	V	0.00	V	0.00	V
Musk Melon 'Durgapura madhu'	4.00	I	4.00	I	3.93	I	3.87	I
Water melon 'Sugar baby'	0.00	V	0.00	V	0.00	V	0.00	V
Cucumber 'Khira-75'	2.27	II	2.07	II	1.93	III	1.80	III
C D 5%	0.24		0.18		0.30		0.24	

\* Average of three replications, DGS—damage grade score

**Rating system**

Damage	Damage Grade Score (DGS)	Description	Host preference	Ranking
No damage	0	—	Not preferred	V
Slight damage	1	Less than 25% area of each cotyledonous leaf damaged by the beetle	Less preferred	IV
Slight medium damage	2	25% or more area per leaf damaged	Moderately preferred	III
Medium damage	3	50% or more area per leaf damage	Preferred	II
Severe damage	4	75% or more area per leaf damaged	Most preferred	I

Preference of red pumpkin beetle to different cucurbit species was evaluated on the basis of both damage rating and pest population. The cucurbits which had characters of high rating, low ranking scores and high population was rated as the most preferred host. The data on peak population, thus collected were subjected to analysis of variance after  $\sqrt{n+0.5}$  transformation.

**RESULTS AND DISCUSSION****Preference and ranking of various cucurbits at seedling stage :**

Significant differences existed between the average damage grade score (DGS) among the crops both at Udaipur and Jobner. Musk melon and long melon were found to be the most preferred host as the DGS was 3.39 to 4.0 at Udaipur and 3.73 to 3.93 at Jobner (Table 1). Pumpkin (3.33-3.47), bottle gourd (3.07-3.20) and ridge gourd (3.27) were also categorised as the most preferred host but the DGS of these crops were significantly lower than those of musk melon and long melon, ranking I in descending order at Udaipur. Sponge gourd and cucumber ranked II falling in the category of preferred host at Udaipur.

At Jobner, pumpkin, bottle gourd, ridge gourd and sponge gourd were categorised as preferred hosts standing in rank II whereas cucumber being in rank III was adjudged as moderately preferred (Table 1). Bitter gourd, round gourd and water melon indicating almost no damage ranked V, thus were considered as non preferred hosts at both the locations.

**Population basis :**

The peak population of red pumpkin beetle recorded on ten cucurbits differed significantly and indicated that long melon, musk melon and pumpkin were the most

Table 2. Population of red pumpkin beetle on different cucurbits at Udaipur

Crop and cultivar	Population* of beetles per 5 plants on different dates of observations									
	1979					1981				
	6/5	13/5	20/5	27/5	8/5	15/5	22/5	29/5		
Pumpkin 'Arka suryamukhi'	7.33 (2.78)	7.33 (2.78)	7.00 (2.70)	6.33 (2.60)	7.67 (2.86)	7.67 (2.86)	7.67 (2.86)	8.00 (2.91)		
Bottle gourd 'PSP long'	3.33 (1.93)	3.33 (1.95)	3.00 (1.85)	2.67 (1.77)	6.33 (2.61)	7.00 (2.74)	7.33 (2.78)	7.00 (2.74)		
Ridge gourd 'Pusa nasdar'	3.00 (1.85)	3.00 (1.87)	3.00 (1.85)	2.33 (2.67)	6.67 (2.67)	7.33 (2.80)	7.00 (2.74)	5.33 (2.39)		
Sponge gourd 'Pusa chikni'	3.00 (1.87)	3.00 (1.87)	3.00 (1.87)	2.67 (1.78)	5.33 (2.40)	6.00 (2.53)	5.67 (2.48)	5.67 (2.48)		
Bitter gourd 'Pusa domousmi'	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)		
Long melon 'Lucknow'	7.67 (2.85)	7.67 (2.85)	7.00 (2.71)	7.00 (2.72)	7.67 (2.84)	8.33 (2.96)	8.00 (2.92)	8.00 (2.92)		
Round gourd 'Arka tinda'	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)		
Musk melon 'Durgapura madhu'	7.00 (2.72)	7.33 (2.78)	7.00 (2.72)	6.67 (2.66)	7.33 (2.80)	8.00 (2.91)	7.67 (2.81)	7.67 (2.83)		
Water melon 'Sugar baby'	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)		
Cucumber 'Khira-75'	2.33 (1.68)	2.33 (1.69)	2.00 (1.60)	1.33 (1.35)	4.33 (2.20)	5.00 (2.34)	4.33 (2.20)	4.00 (2.11)		
CD 5%	(0.24)	(0.17)	(0.00)	(0.30)	(0.30)	(0.30)	(0.41)	(0.41)		

\* Ave-age of three replication; Figures in parentheses are  $\sqrt{n + 0.5}$  transformed values.

Date of sowing 25.2.1979 and 13.3.1981

Table 3. Population of red pumpkin beetle on different cucurbits at Jobner

Crop and cultivar	Population* of beetles per 5 plants in different dates of observations									
	1980					1981				
	30/4	7/5	14/5	21/5	2/5	9/5	16/5	23/5		
Pumpkin 'Arka suryamukhi'	4.33 (2.19)	5.67 (2.46)	6.00 (2.52)	6.00 (2.53)	4.00 (2.11)	5.33 (2.42)	5.33 (2.42)	6.00 (2.55)		
Bottle gourd 'PSP long'	3.00 (1.85)	3.00 (1.82)	3.00 (1.87)	3.67 (2.01)	3.00 (1.86)	3.00 (1.87)	3.33 (1.95)	3.33 (1.95)		
Ridge gourd 'Pusa nasdar'	2.67 (1.77)	3.00 (1.85)	3.33 (1.95)	1.67 (1.46)	2.33 (1.68)	2.67 (1.77)	1.67 (1.46)	1.00 (1.17)		
Sponge gourd 'Pusa chikni'	2.00 (1.58)	2.67 (1.78)	2.67 (1.78)	1.33 (1.35)	2.00 (1.56)	1.33 (1.29)	0.00 (0.70)	0.00 (0.70)		
Bitter gourd 'Pusa domousmi'	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)		
Long melon 'Lucknow'	5.00 (2.33)	6.67 (2.66)	6.67 (2.66)	6.00 (2.53)	5.00 (2.54)	6.00 (2.55)	6.00 (2.55)	4.67 (2.27)		
Round gourd 'Arka tinda'	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)		
Musk melon 'Durgapura madhu'	5.00 (2.32)	6.33 (2.59)	6.33 (2.60)	5.33 (2.40)	5.67 (2.48)	6.33 (2.61)	6.33 (2.59)	5.33 (2.40)		
Water melon 'Sugar baby'	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)	0.00 (0.70)		
Cucumber 'Khira-75'	2.00 (1.58)	2.67 (1.78)	2.67 (1.78)	2.33 (1.68)	2.33 (1.68)	2.67 (1.77)	3.67 (2.04)	2.67 (1.77)		
CD 5%	(0.22)	(0.38)	(0.17)	(0.24)	(0.30)	(0.30)	(0.30)	(0.30)		

\*Average of three replications; Figures in parentheses are  $\sqrt{n+0.5}$  transformed values.

Date of sowing : 20.2.80 and 7.2.1981.

preferred hosts both at Udaipur and Jobner, however, these were at par (Tables 2 and 3). The population of beetles on long melon, musk melon and pumpkin ranged between 6.33 to 8.33/5 plants at Udaipur and 3.33 to 6.67/5 plants at Jobner. On the basis of population recorded, bottle gourd (2.67-7.33/5 plants), ridge gourd (2.33-7.0/5 plants) and sponge gourd (2.67-7.33/5 plants) were treated as preferred host while cucumber (1.33-5.0/5 plants) as moderately preferred at Udaipur. Likewise at Jobner, bottle gourd, cucumber and ridge gourd were the preferred host while sponge gourd as moderately preferred. The population of red pumpkin beetle on bitter gourd, round gourd and water melon was not recorded throughout the growing period of the crop, hence they were regarded as non preferred host at both the places.

Considering the damage caused by red pumpkin beetle to seedlings and its population recorded on different cucurbits, grown in one field, musk melon, long melon and pumpkin were considered the most preferred host, bottle gourd and ridge gourd as preferred and sponge gourd and cucumber as moderately preferred. Bitter gourd, round gourd and water melon were termed as non-preferred hosts. The present findings are in agreement with those of Saini (1959), Nath (1964) and Sandhu and Bhalla (1974) who reported musk melon as the most preferred host of this beetle. Similarly long melon and pumpkin have also been reported as preferred host by Sandhu and Bhalla (1974) and Bogawat and Pandey (1967) respectively. Peculiarly, Bogawat and Pandey (1967) reported musk melon as non-preferred host where the beetles did not feed. Sandhu and Bhalla (1974) considered pumpkin as a moderately preferred host for *A. foveicollis*. Bottle gourd being preferred host in our findings do not corroborate with those of Nath (1964) and Sandhu and Bhalla (1974) who found it as moderately preferred and least preferred (Bogawat and Pandey 1967).

The present findings corroborate those of Bogawat and Pandey (1967) and Sandhu and Bhalla (1974) who reported water melon and bitter gourd as being rarely attacked by red pumpkin beetle. However, contrary to our investigations, round gourd was reported as a moderately preferred host (Sandhu and Bhalla 1974).

#### REFERENCES

- Bogawat, J.K. and Pandey, S.N. 1967. Food preference in *Aulacophora* spp. Indian Journal of Entomology 29: 349-352.
- Nath, P. 1964. Resistance of cucurbits to the red pumpkin beetle. Indian Journal of Horticulture 21: 77-78.
- Nath, P. and Thakur, M.R. 1965. Evaluation for red pumpkin beetle resistance in gourds. Indian Journal of Horticulture 22: 330-339.
- Saini, R.S. 1959. Studies on the food preference of *Aulacophora*. Madhya Bharati 8: 55-57.
- Sandhu, G.S. and Bhalla, J.S. 1974. Red pumpkin beetle an important pest of cucurbits. Punjab Horticulture Journal 14: 70-74.