

## RESEARCH ARTICLE

# Preference of mustard aphid, *Lipaphiserysimi* (Kalt.) to different *Brassica* species

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## ABSTRACT

Preference to *Lipaphiserysimi* Kalt, on different *Brassica* species were carried out at Student's Instructional Farm of Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad (U.P.) during Rabi 2009-2010 and 2010-2011 crop seasons. The seeds of six *Brassica* species, viz., BSH-1 (*B. campestris* var. *brown sarson*), YST-151 (*B. campestris* var. *yellow sarson*), Varuna (*B. juncea*), HYOLA-401 (*B. napus*), Kiran (*B. carinata*) and T<sub>-27</sub> (*Eruca sativa*) were sown to record the aphid population. *Lipaphiserysimi* Kalt. appeared on plants during the second week of January and continued upto harvesting in both the years. First observation was taken on second week in both the years. The minimum population of 1.63 /10 cm terminal shoot/plant and 1.47/10cm terminal shoot/plant were observed on species Kiran (*B. carinata*) during 2009-2010 and 2010-11, respectively and the maximum population of 2.62/10cm terminal shoot/plant and 2.82/10 cm terminal shoot/plant on species BSH-1 (*B. campestris* var. *brown sarson*) during 2009-2010 and 2010-2011. The peak population of *Lipaphiserysimi* Kalt., was observed on eighth standard week. Minimum pest population was 33.00cm terminal shoot/plant on species T<sub>-27</sub> (*Eruca sativa*) and 29.72/10cm terminal shoot/plant on species Kiran (*B. carinata*) the maximum populations were 219.07/10 cm terminal shoot/plant and 199.10/10cm terminal shoot/plant on species BSH-1 (*B. campestris* var. *brown sarson*) during 2009-2010 and 2010-2011, respectively. The result showed that among all the species under observation *Lipaphiserysimi* preferred the species-BSH-1 (*B. campestris* var. *brown sarson*) than the others species.

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## INTRODUCTION

Rapeseed-mustard is most important source of edible oil for human consumption. India is the second largest producer of rapeseed-mustard after China. To increase the productivity of this commodity, various modern techniques of agricultural practices such as use of high yielding varieties and heavy manuring were used (Srivastava and Guleria, 2003). Rapeseed-mustard is highly vulnerable to attack of various insect pests. In this regard, Bhaketia and Sekhon (1989) reported more than three dozens insect-pests associated with this crop. Among them, mustard aphid, *Lipaphiserysimi* Kalt.

has been thoroughly studied as serious insect- pest of this crop. Most of the farmers are not aware with the effect of chemical pesticides and still using most of the systemic and organic insecticides to control this insect pest. Injudicious and continuous use of insecticides may be deleterious to agro-ecosystem, public health and create residual problems. Therefore, the losses caused by insect pests particularly aphids have compelled the entomologists to develop control strategies for these insect pests. Feeling the gravity of the situation, the study was carried out to assess the species preference of *Lipaphiserysimi* Kalt to different *Brassica* species under agro-ecological conditions of Faizabad, district in Uttar Pradesh.

## MATERIALS AND METHODS

Field experiments were conducted at Students Instructional Farm, N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during the two consecutive years 2009-2010 and 2010-2011. *Brassica* species cv. BSH-1 (*B. campestris* var. *brown sarson*), YST-151 (*B. campestris* var. *yellow season*), Varuna (*B. juncea*), HYOLA-401 (*B. napus*), Kiran (*B. carinata*) and T<sub>-27</sub> (*Eruca sativa*) were sown on November 20 in both the study years, and the effect was studied on the incidence of aphid on this crop. The experiments were laid out in Randomized Block Design (RBD) with four replications, each in 4 x 3m plot size. The spacing between row to row and plant to plant were 30 cm and 15 cm, respectively. All the recommended agronomic practices were followed to raise the crop except plant protection measures.

Regular observations on the population of mustard aphid were recorded throughout the growing season of the

crop. The crop was monitored regularly for initial incidence as well as for population count of mustard aphid. For recording population count of mustard aphid, 10 plants were randomly selected from each plot and the population of mustard aphid was recorded at weekly interval by removing aphids from 10 cm top portion of the terminal shoot of each plant with the help of camel hair brush on a white paper. However, insecticides were not sprayed in and around the experimental area.

## RESULTS AND DISCUSSION

The detailed results on various aspects of aphid, *Lipaphiserysimi* development are discussed as follows. The results of mean aphid population, 10cm terminal shoot/plan on different *Brassica* species at weekly interval starting from the appearance of aphid till maturity of the crop are presented in Table 1 and 2. A critical review of the data showed that

**Table 1: Incidence of mustard aphid, *Lipaphiserysimi* on different *Brassica* spp. during Rabi 2009-2010**

Standard weeks	Number of aphids/plant					
	BSH-1	Yst-151	Varuna	Hyola-401	Kiran	T <sub>-27</sub>
2	2.62 (1.75)	2.22 (1.63)	2.05 (1.65)	1.90 (1.53)	1.63 (1.45)	2.50 (1.70)
3	5.50 (2.44)	4.15 (2.13)	3.30 (1.94)	3.12 (1.89)	3.25 (1.93)	3.08 (1.86)
4	16.35 (4.10)	15.75 (4.02)	10.68 (3.33)	4.75 (2.27)	3.70 (2.31)	5.28 (2.38)
5	31.05 (5.60)	25.48 (5.08)	27.90 (5.32)	15.40 (3.98)	9.85 (3.20)	11.90 (3.50)
6	55.83 (7.50)	51.50 (7.20)	47.83 (6.93)	19.45 (4.45)	13.20 (3.67)	15.80 (4.01)
7	154.60 (12.40)	137.10 (11.63)	129.90 (11.40)	28.45 (5.35)	20.40 (4.56)	27.80 (5.28)
8	219.07 (14.80)	194.27 (13.95)	175.52 (13.26)	61.65 (7.86)	33.00 (5.74)	40.42 (6.38)
9	47.98 (6.90)	34.18 (5.86)	25.80 (6.01)	14.58 (3.87)	11.70 (3.49)	21.40 (4.68)
10	11.95 (3.52)	12.20 (3.54)	12.33 (3.56)	7.50 (2.81)	4.85 (2.30)	14.20 (3.81)
11	4.85 (2.29)	3.47 (1.99)	6.17 (2.58)	5.50 (2.44)	2.58 (1.73)	5.58 (2.44)
12	0.15 (0.80)	0.17 (0.82)	1.60 (1.44)	1.90 (1.54)	0.73 (1.06)	3.55 (2.00)

Figures in parentheses are square root transformed values

**Table 2: Incidence of mustard aphid, *Lipaphiserysimi* on different *Brassica* spp. during Rabi 2010-2011**

Standard weeks	Number of aphids/plant					
	BSH-1	Yst-151	Varuna	Hyola-401	Kiran	T <sub>-27</sub>
2	2.82 (1.80)	2.10 (1.60)	2.27 (1.65)	2.10 (1.60)	1.47 (1.40)	1.95 (1.54)
3	5.35 (2.41)	3.07 (1.88)	3.92 (2.06)	2.90 (1.83)	2.57 (1.73)	2.60 (1.75)
4	15.80 (4.01)	10.68 (3.33)	11.83 (3.50)	4.10 (2.13)	4.27 (2.18)	4.30 (2.17)
5	28.68 (5.38)	20.05 (4.52)	23.73 (4.90)	13.13 (2.68)	9.70 (3.18)	8.13 (2.92)
6	50.40 (7.12)	29.75 (5.49)	41.63 (6.47)	19.43 (4.45)	13.58 (3.73)	11.20 (3.40)
7	118.9 (10.89)	82.35 (9.09)	103.2 (10.18)	26.85 (5.20)	21.08 (4.63)	17.90 (4.28)
8	199.1 (14.12)	184.85 (13.66)	173.12 (13.17)	57.20 (7.55)	29.72 (5.47)	39.42 (6.21)
9	49.58 (7.06)	29.20 (5.42)	42.83 (6.54)	14.03 (3.80)	11.83 (3.48)	10.30 (3.28)
10	20.90 (4.59)	11.75 (3.49)	17.32 (4.20)	5.75 (2.48)	4.32 (2.17)	4.63 (2.26)
11	4.92 (2.31)	6.22 (2.58)	11.28 (5.21)	5.27 (2.39)	2.42 (1.70)	2.85 (1.84)
12	0.20 (0.83)	0.11 (0.77)	0.25 (0.86)	2.35 (1.68)	2.45 (1.71)	0.37 (0.90)

Figures in parentheses are square root transformed values

aphid population varied significantly with *Brassica* species. The population of aphids declined gradually towards the maturity of the plants in both the years. The infestation of *Lipaphiserysimi* on species YST-151 (*B. campestris* var. *yellow season*), appeared during second week of January (2.22/10 cm terminal shoot/plant and 2.10/10 cm terminal shoot/plant). *Lipaphiserysimi* multiplied very rapidly during January and February and reached to its peak (194.27/10 cm terminal shoot/plant and 184.85/10 cm terminal shoot/plant) during fourth week of February. Thereafter pest population declined during the third week of March due to crop maturity during both year. The abundance of *Lipaphiserysimi* on species Varuna (*B. juncea*) was recorded during second week of January (2.05/10 cm terminal shoot/plant and 2.27/10 cm terminal shoot/plant) and aphid population multiplied rapidly and reached to its peak (175.52/10 cm terminal shoot/plant and 173.12/10 cm terminal shoot/plant) during fourth week of February and declined gradually with crop maturity in both the years. The infestation of *Lipaphiserysimi* on species BSH-1 (*B. campestris* var. *brown sarson*) was comparatively higher (2.62/10 cm terminal shoot/plant and 2.82/10 cm terminal shoot/plant) during 2009-2010 and 2010-2011, respectively than rest of the varieties under observational trial. The population of *Lipaphiserysimi* multiplied rapidly in February and reached at peak (219.07/10 cm terminal shoot/plant and 199.10/10 cm terminal shoot/plant) during fourth week of February and aphid population declined rapidly towards the maturity of crop. The population of *Lipaphiserysimi* on species HYOLA-401 (*B. napus*), was (1.90/10 cm terminal shoot/plant and 2.10/10 cm terminal shoot/plant) on second week of January. The *Lipaphiserysimi* increased its population and reached at its peak (61.65/10 cm terminal shoot/plant and 57.20/10 cm terminal shoot/plant) on fourth week of February. The population of *Lipaphiserysimi* gradually declined during the first week of March during in both the crop seasons. The appearance of aphid population on species T<sub>-27</sub> (*Eruca sativa*) was recorded during second week of January (1.63/10 cm terminal shoot/plant and 1.95 /10 cm terminal shoot/plant). The aphid infestation increased gradually with plant reproductive stages and reached to peak (40.42/10 cm terminal shoot/plant and 39.42/10 cm terminal shoot/plant) during fourth week of February during 2009-2010 and 2010-2011. The infestation and abundance of *Lipaphiserysimi* on species Kiran (*B. carinata*), was lower (1.63/10 cm terminal shoot/plant and 1.47/10 cm terminal shoot/plant) during second week of January than other varieties. The pest population multiplied gradually and

reached maximum (33.00/10 cm terminal shoot/plant and 29.72/10 cm terminal shoot/plant) during last week of February and declined rapidly during first week of March during 2009-2010 and 2010-2011, respectively. The results on preference of *Lipaphiserysimi* Kalt., on different *Brassica* species showed that the incidence of *Lipaphiserysimi* were recorded during second week of January. The population of *Lipaphiserysimi* rapidly multiplied and reduced gradually in first week of March due to maturity of the crop. The results showed that maximum aphid population was observed on species BSH-1 (*B. campestris* var. *brown sarson*) followed by YST-151 (*B. campestris* var. *yellow season*), Varuna (*B. juncea*), HYOLA-401 (*B. napus*), T<sub>-27</sub> (*Eruca sativa*) and Kiran (*B. carinata*) respectively. Naveen *et al.* (1996) studied the influence of crop morphological parameters on infestation of *Lipaphiserysimi* (Kalt) on *Brassica* genotypes and reported that *Lipaphiserysimi* appeared in the 4th week of January and continued upto the third week of March. Ram and Gupta (1987) reported that cloudy weather caused an increase in aphid population.

#### Conclusion :

On the basis of data presented, it could therefore be concluded that:

- The aphid, *Lipaphiserysimi* (Kalt.) preferred the *Brassica* species from second week of January to third week of March.
- The species BSH-1 (*B. campestris* var. *brown sarson*) and YST-151 (*B. campestris* var. *yellow season*) were comparatively susceptible to aphid and Kiran (*B. carinata*) and T<sub>-27</sub> (*Eruca sativa*) were resistant.

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