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## Evaluation of *Luffa acutangula* L. cultivars against leaf miner

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**Abstract**

The field study was carried out on the evaluation of *Luffa acutangula* L. cultivars against leaf miner during *kharif* season of 2017 at Central Experimental Station, Wakawali, Dist. Ratnagiri. During present investigation, fifteen ridge gourd cultivars were screened against leaf miner infesting ridge gourd. The infestation of leaf miner was started from seedling stage of ridge gourd. The results revealed that the highest mean infestation of leaf miner was recorded in cultivar RG-2 with  $0.88 \pm 0.46$  leaf mines/three leaves/plant followed by Utkal Trupti (0.84), RG-1 (0.84) and RGH-3 (0.50). The minimum mean infestation ( $0.13 \pm 0.46$ ) was recorded in cultivar KRG-5.

**Keywords:** *Luffa acutangula* L., screening, leaf miner, ridge gourd

**Introduction**

Ridge gourd (*Luffa acutangula* L.) is considered to be old species with its native to the tropical Africa and South East Asian region including India. It is widely grown in tropical and subtropical parts of the country. It belongs to family Cucurbitaceae and genus *Luffa*. It is one of the important crops belonging to cucurbits and locally called as *Shiral*, *Dodka* (Marathi), *Turai* (Gujarat) and *Koshataki* (Sanskrit).

Cucurbits are attacked by several pests which affect the quality and quantity of produce adversely. Most of the insect-pests cause damage at any stage of plant growth, but some of them is serious at seedling stage *viz.*, red pumpkin beetle, leaf miner, flea beetle, while fruit fly appears at fruiting stage (Ram *et al.* 2009) [7]. Out of that leaf miner is a minor pest in cucurbits. Damage is caused mostly by larvae that feed and mine the mesophyll and by the female feeding behavior, puncturing the leaf with its ovipositor and feeding on the leaf sap, which decreases photosynthesis (Parrella, 1983) [6]. As well, they may transmit plant pathogens during oviposition (Minkenberg and Helderman, 1990) [4].

Chemical control of leaf miners usually lasts only a short period of time and adult control with contact insecticides is often ineffective because flies can easily move around, and the treated field is subject to re-infestation from adjacent untreated crops and weeds (Le Strange *et al.* 1999) [3]. Leaf miners have developed a high degree of resistance to a broad range of insecticides (Keil and Parrella, 1990) [2]. Therefore, it is essential to develop alternative strategies for leaf miner management. Resistant varieties remain the most economical means of insect control. Their development could reduce pesticide use, which would be beneficial to growers, consumers, and the environment. Though the crop is economically important, the information on the resistant cultivars of ridge gourd against leaf miner is scanty particularly in Konkan region in Maharashtra. Hence, the present investigations were undertaken on evaluation of *Luffa acutangula* L. cultivars against leaf miner.

**Materials and methods**

To study the response of some promising ridge gourd cultivars against leaf miner infesting ridge gourd, a field experiment was carried out at Central Experiment Station, Wakawali, from June 2017 to September 2017.

**Experimental details**

- |                        |      |                             |
|------------------------|------|-----------------------------|
| 1) Number of cultivars | :    | Fifteen                     |
| 2) Size of the plot    | :    | 135.00 m <sup>2</sup>       |
| 3) Spacing             | :    | 1.50 m × 0.50 m             |
| 4) Method of planting  | :    | On small hills              |
| 5) Date of sowing      | :    | 12 <sup>th</sup> June, 2017 |
| 6) Cultivars           | :    |                             |
| i Konkan Harita        | ix   | Pusa Nasdar                 |
| ii JRGH-22             | x    | RGH-3                       |
| iii Utkal Trupti       | xi   | MHRG-7                      |
| iv NRG-9               | xii  | JRGL-13                     |
| v JRGH-28              | xiii | Satputiya                   |
| vi RG-2                | xiv  | RGH-1                       |
| vii RG-1               | xv   | BSS-405                     |
| viii KRG-5             |      |                             |

**Method of recording observations**

All the cultivars were kept unsprayed throughout the crop season. The observations were recorded when incidence was noticed. Five plants of each cultivar were selected randomly and marked permanently to record the observations. The leaf mines were counted from top, middle and bottom leaf of vine for leaf miner damage. The observations were recorded at weekly interval throughout the crop season. The mean infestation of leaf miner was taken and standard deviation was worked out.

**Result and Discussion****Screening of some cultivars against leaf miner infesting ridge gourd.**

Data regarding screening of cultivars against leaf miner infesting ridge gourd are presented in Table 1 and graphically illustrated in Fig. 1.

The data at 15 days after sowing showed that infestation of leaf miner was not observed on cultivars *viz.*, RG-2, KRG-5, Pusa Nasdar, RGH-3, Konkan Harita, MHRG-7, JRGL-13, Satputiya, RGH-1, JRGH-28 and JRGH-22. While in other cultivars, the infestation was noticed in the range of 0.50 to 1.00 leaf mines per three leaves per plant. The maximum infestation was observed in cultivars RG-1 and BSS-405, which recorded  $1.00 \pm 0.37$  leaf mines per three leaves per plant, while the remaining cultivars *viz.*, Utkal Trupti and NRG-9 recorded  $0.50 \pm 0.37$  leaf mines each, respectively.

The data of 30 days after sowing revealed that the cultivars Utkal Trupti, RG-2, KRG-5, Pusa Nasdar, RGH-3, Konkan Harita, MHRG-7, JRGL-13, Satputiya, RGH-1, BSS-405 and JRGH-28 were free from infestation of leaf miner while, in other cultivars the infestation was noticed in the range of 0.25 to 0.50 leaf mines per three leaves per plant. The remaining cultivars *viz.*, NRG-9 and JRGH-22 recorded 0.50 and 0.50 leaf mines per three leaves per plant, respectively while the lowest ( $0.25 \pm 0.18$ ) infestation was recorded in cultivar RG-1.

The data of 45 days after sowing showed that the cultivars RG-2, RG-1, Pusa Nasdar, Konkan Harita, JRGL-13, Satputiya, JRGH-28 and JRGH-22 were free from infestation of leaf miner while, in other cultivars the infestation was observed in the range of 0.25 to 1.50 leaf mines per three leaves per plant. The highest infestation was observed in cultivar Utkal Trupti which recorded  $1.50 \pm 0.49$  leaf mines per three leaves per plant while, the remaining cultivars *viz.*, NRG-9, RGH-3, MHRG-7 and RGH-1 recorded 1.25, 0.75, 0.50 and 0.50 leaf mines per three leaves per plant, respectively. The lowest infestation (0.25) noticed on cultivars KRG-5 and BSS-405.

The data of 60 days after sowing revealed that the cultivars JRGH-28 and JRGH-22 was free from infestation of leaf miner while, in other cultivars the infestation was observed in the range of 0.25 to 1.75 leaf mines per three leaves per plant. The highest infestation was observed in cultivars RGH-3 and Satputiya which recorded  $1.75 \pm 0.57$  leaf mines per three leaves per plant while, the remaining cultivars *viz.*, Utkal Trupti, RG-2, Konkan Harita, Pusa Nasdar, BSS-405, NRG-9, RG-1, KRG-5 and RGH-1 recorded 1.50, 1.25, 1.00, 0.75, 0.75, 0.50, 0.50, 0.50 and 0.50 leaf mines per three leaves per plant, respectively. The cultivar MHRG-7 recorded lowest ( $0.25 \pm 0.57$ ) infestation.

The data at 75 days after sowing revealed that no infestation of leaf miner was observed on both cultivars *viz.*, RG-1 and KRG-5 while in other cultivars, the infestation was noticed in the range of 0.25 to 3.25 leaf mines per three leaves per plant. The maximum infestation was recorded in cultivar RG-2 ( $3.25 \pm 0.84$ ) followed by Konkan Harita (1.75), RGH-1 (1.75), Pusa Nasdar (1.50), MHRG-7 (1.50), RGH-3 (1.00), JRGL-13 (0.75) Satputiya (0.75), BSS-405 (0.75), JRGH-28 (0.75) and JRGH-22 (0.75). The lowest infestation was noticed on NRG-9 ( $0.25 \pm 0.84$ ).

The data at 90 days after sowing showed that no infestation of leaf miner were observed in cultivars *viz.*, Pusa Nasdar, RGH-3, Konkan Harita, JRGL-13, Satputiya, RGH-1, BSS-405 and JRGH-22. While in other cultivars, the infestation was noticed in the range of 0.25 to 2.00 leaf mines per three leaves per plant. The maximum infestation was recorded in cultivar RG-1 ( $2.00 \pm 0.51$ ) followed by Utkal Trupti (0.50), JRGH-28 (0.50). The lowest infestation recorded ( $0.25 \pm 0.51$ ) on cultivars NRG-9, RG-2, KRG-5 and MHRG-7.

The data at 105 days after sowing revealed that no infestation of leaf miner was observed in cultivars KRG-5, Pusa Nasdar, MHRG-7, Satputiya, RGH-1, BSS-405 and JRGH-28. While in other cultivars, the infestation was noticed in the range of 0.25 to 3.00 leaf mines per three leaves per plant. The maximum infestation was recorded in cultivar RG-1 ( $3.00 \pm 1.00$ ) followed by Utkal Trupti (2.25), RG-2 (2.25), Konkan Harita (0.75), RGH-3 (0.50) and JRGL-13 ( $0.50 \pm 1.00$ ). While the lowest infestation ( $0.25 \pm 1.00$ ) was noticed on NRG-9 and JRGH-22.

The data at 120 days after sowing revealed that all cultivars were free from infestation of leaf miner.

The data on overall mean infestation of leaf miner indicated that the infestation was in the range of 0.13 to 0.88. The highest mean infestation was recorded in cultivar RG-2 ( $0.88 \pm 0.46$ ) leaf mines/three leaves/plant). The mean infestation recorded in remaining cultivars in descending order was Utkal Trupti (0.84), RG-1 (0.84), RGH-3 (0.50), NRG-9 (0.44), Konkan Harita (0.44), RGH-1 (0.34), BSS-405 (0.34), MHRG-7 (0.31), NRG-9 (0.44), Konkan Harita (0.44), RGH-1 (0.34), BSS-405 (0.34), MHRG-7 (0.31), Satputiya (0.31), Pusa Nasdar (0.28), JRGL-13 (0.22), JRGH-22 (0.19) and JRGH-28 (0.16). Lowest mean infestation ( $0.13 \pm 0.46$ ) was recorded in cultivar KRG-5.

The present findings are more or less in conformity with the results of Nandihalli *et al.* (1995) <sup>[5]</sup> who screened 11 genotypes of ridge gourd against the serpentine leaf miner, *L. trifolii* (Burgess), amongst which Raichur local-2, Devadurg local and Poona local were found to withstand the leaf miner damage and recorded highest yields compared to other genotypes.

Duradundi *et al.* (2015) <sup>[1]</sup> screened eighteen genotypes of ridge gourd against serpentine leaf miner. The number of live

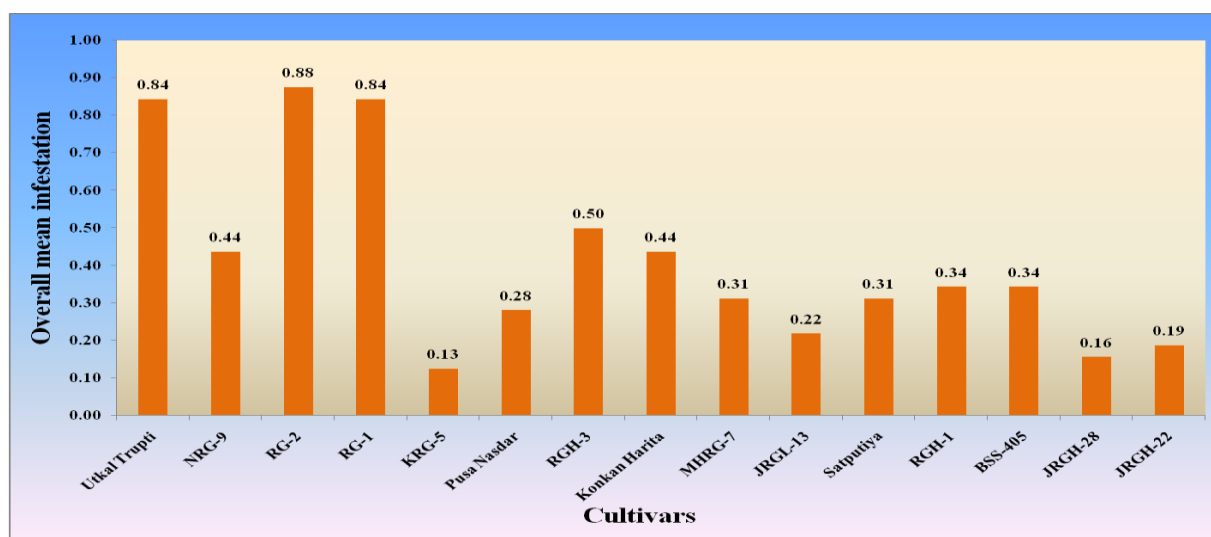
mines per leaf per plant was lowest in genotype Naga ( $1.82 \pm 0.43$ ) whereas, maximum was recorded in Kadahatti local ( $4.18 \pm 0.82$ ). The number of live mines per leaf per plant was minimum at 15 DAS ( $1.33 \pm 0.09$ ) whereas, it was maximum

at 60 DAS ( $5.83 \pm 0.43$ ). In the interaction effect, the genotypes, KRCCH-1 registered significantly lowest number of live mines per leaf per plant at 30 DAS ( $0.46 \pm 0.16$ ) and Naga 45 DAS ( $0.06 \pm 0.02$ ), respectively.

**Table 1:** Mean infestation of leaf miner on some cultivars of ridge gourd.

Cultivars	15 DAS*	30 DAS	45 DAS	60 DAS	75 DAS	90 DAS	105 DAS	120 DAS	Overall mean infestation
Utkal Trupti	0.50	0.00	1.50	1.50	0.50	0.50	2.25	0.00	0.84
NRG-9	0.50	0.50	1.25	0.50	0.25	0.25	0.25	0.00	0.44
RG-2	0.00	0.00	0.00	1.25	3.25	0.25	2.25	0.00	0.88
RG-1	1.00	0.25	0.00	0.50	0.00	2.00	3.00	0.00	0.84
KRG-5	0.00	0.00	0.25	0.50	0.00	0.25	0.00	0.00	0.13
Pusa Nasdar	0.00	0.00	0.00	0.75	1.50	0.00	0.00	0.00	0.28
RGH-3	0.00	0.00	0.75	1.75	1.00	0.00	0.50	0.00	0.50
Konkan Harita	0.00	0.00	0.00	1.00	1.75	0.00	0.75	0.00	0.44
MHRG-7	0.00	0.00	0.50	0.25	1.50	0.25	0.00	0.00	0.31
JRGL-13	0.00	0.00	0.00	0.50	0.75	0.00	0.50	0.00	0.22
Satputiya	0.00	0.00	0.00	1.75	0.75	0.00	0.00	0.00	0.31
RGH-1	0.00	0.00	0.50	0.50	1.75	0.00	0.00	0.00	0.34
BSS-405	1.00	0.00	0.25	0.75	0.75	0.00	0.00	0.00	0.34
JRGH-28	0.00	0.00	0.00	0.00	0.75	0.50	0.00	0.00	0.16
JRGH-22	0.00	0.50	0.00	0.00	0.75	0.00	0.25	0.00	0.19
SD	$\pm 0.37$	$\pm 0.18$	$\pm 0.49$	$\pm 0.57$	$\pm 0.84$	$\pm 0.51$	$\pm 1.00$	$\pm 0.00$	$\pm 0.46$

\*DAS: Days after Sowing



**Fig 1:** Screening of some cultivars of ridge gourd against leaf miner

## Conclusion

During this study, fifteen ridge gourd cultivars were screened against leaf miner infesting ridge gourd. The infestation of leaf miner was started from seedling stage of ridge gourd. The results revealed that the highest mean infestation of leaf miner was recorded in cultivar RG-2 with  $0.88 \pm 0.46$  leaf mines/three leaves/plant followed by Utkal Trupti (0.84), RG-1 (0.84) and RGH-3 (0.50). The minimum mean infestation ( $0.13 \pm 0.46$ ) was recorded in cultivar KRG-5. There was none of the cultivars resistance against leaf miner.

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