Int.J.Curr.Microbiol.App.Sci (2018) *7*(4): 414-418

International Journal of Current Microbiology and Applied Sciences
***ISSN: 2319-7706* Volume 7 Number 04 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.704.047

Screening of Cucumber Genotypes against Powdery Mildew

H. Parameshwar Naik* and Shripad Kulkarni

Department of Plant Pathology, College of Agriculture, UAS, Dharwad-580005, Karnataka, India

**Corresponding author*

Keywords

Cucumis sativus L., Cucumber genotypes

Article Info

Accepted:
04 March 2018
Available Online:
10 April 2018

A B S T R A C T

(*Cucumis sativus* L.) is one of the oldest cultivated vegetable crops belongs to the family cucurbitaceous with 7 pairs of chromosomes and several distinct morphological features stands apart from other species with 12 pairs of chromosomes which are indigenous to tropical Africa. Now a day's powdery mildew has become a major disease in cucumber, since there is no detailed quantitative information on effective management of the disease resistance genotypes plays an important role to combat against pathogen. This can be used as one of the strategy for the management of the disease. Twenty three genotypes were screened against *E. cichoracearum* under natural epiphytotic conditions in the field to identify the resistance source during late *kharif* 2016 none were found to be immune or and resistant. However, fifteen genotypes *Viz.*, Swathi, BSS-949, JK-special, Mahy Sylvia, Malini, Shirakawa, Yummy, Kareena, Green long, Ajeeth-99, White long, Encounter-962, Shalini, Ranebennur local and Sarpan hybrid were found to be moderately resistant with five grade and five genotypes *Viz.*, Chetak, Gullakai, Khushi, Sribasava and Harini were found to be moderately susceptible with seven grade and Mangalore local, Dharwad green and chitra showed highly susceptible reaction with maximum reaction of nine grade.

Introduction

Cucumber (*Cucumis sativa* L.) is a popular fresh market vegetable preferred for several food stuffs and is cultivated throughout India. The total area under cucumber cultivation in India is 71000 hectare with a production of 1202000 tonnes with an average productivity of 16.92 tonnes (Anon, 2015-16). Powdery mildew is a serious disease and causes considerable yield loss to the number of cucurbitaceous crops grown in India. Its distribution and relative occurrence varies throughout the world. Most of the cucurbits are found susceptible to powdery mildew disease but few cucurbits are not much infected due to resistant cultivars. This disease reduces the yield by interfering with photosynthetic activity and biochemical imbalance. Till date across the world more than eight genera have been reported from order Erysiphales. Among them *Erysiphe cichoracearum, Sphaerotheca fuliginea* and *Levilulla taurica* are the major pathogens. Cucumber powdery mildew caused by *Erysiphe cichoracearum and Sphaerotheca fuliginea* has worldwide importance and it is considered to be one of the most devastating

disease as its occurrence and incidence assumes greater significance resulting in reduction of fruit yield. Powdery mildew and downy mildew together causes up to 50-70 per cent a loss (Sitterly, 1972 and Awad, 2000).

The most cost effective way of combating diseases is the production of cucumber hybrids with multiple disease resistance. Due to the unfavorable climatic conditions, resistant varieties are becoming susceptible and also not showing consistent resistance. A few commercial cucumber varieties or hybrids resistant to powdery mildew and downy mildew diseases are currently available in India. Primary importance in disease management is host plant resistance. To achieve this, in the present study screening of cucumber genotypes has been taken in late *kharif* during 2016.

Materials and Methods

A field experiment was conducted to find out the resistance source against cucumber powdery mildew. Totally twenty three genotypes were collected and screened against powdery mildew under artificial epiphytotic condition. Each genotype was sown in three rows of five meter length during the late *kharif* 2016 at MARS, Dharwad. The disease severity was recorded using 0-9 scale by randomly selecting five plants in each genotype (Mayee and Datar, 1986). Based on their reaction genotypes were categorized into immune, resistant, moderately resistant, moderately susceptible, susceptible and highly susceptible.

Five plants were randomly selected and powdery mildew severity was recorded by following 0-9 scale through visual observation (Mayee and Datar, 1986) as given below.

Disease scoring scale

Per cent disease index (PDI)

The severity of cucumber powdery mildew was recorded by using 0-9 scale developed by Mayee and Datar (1986) as given below:

Results and Discussion

Twenty three genotypes were screened against *E. cichoracearum* under artificial epiphytotic conditions in the field to identify the resistance source during late *kharif* 2016 as described in "Material and Methods" and results are presented in Table 1. The results from the experiment revealed that, out of twenty three genotypes screened, none was found to be immune or and resistant. However, fifteen genotypes *viz.*, Swathi, BSS-949, JK-special, Mahy Sylvia, Malini, Shirakawa, Yummy, Kareena, Green long, Ajeeth-99, White long, Encounter-962, Shalini, Ranebennur local and Sarpan hybrid were found to be moderately resistant with five grade and five genotypes *Viz.*, Chetak, Gullakai, Khushi, Sribasava and Harini were found to be moderately susceptible with seven grade and Mangalore local, Dharwad green and chitra showed highly susceptible reaction with maximum reaction of nine grade.

The management of the disease through host plants resistance has been the best choice in all the disease management programmes. Utilization of resistant cultivars in farming system is the most simple, effective and economical method in the management of disease. Besides this, these resistant cultivars conserve natural resources and reduce the cost, time and energy compared to the other methods of disease management.

Experiment on screening of cucumber genotypes was conducted during late *kharif* 2016. Twenty three genotypes were screened against *E. cichoracearum* under artificial epiphytotic conditions among them none of the genotypes shown immune or resistant, however, fifteen genotypes *Viz.*, Swathi, BSS-949, JK-special, Mahy Sylvia, Malini, Shirakawa, Yummy, Kareena, Green long,

Ajeeth-99, White long, Encounter-962, Shalini, Ranebennur local and Sarpan hybrid were found moderately resistant and five genotypes *viz.*, Chetak, Gullakai, Khushi, Sribasava and Harini were moderately susceptible genotypes such as Mangalore local, Dharwad green and Chitra, showed highly susceptible reaction and these work are lined with Gondi (2015) Pitchaimuthu *et al.*, (2012) (Table 2).

Table.1 Reaction of cucumber genotypes against powdery mildew caused by *Erysiphe cichoracearum* (0-9 scale)

SL. No.	Genotype	Maximum grade observed	Reaction type
1	Swathi	5	MR
2	BSS-949	5	MR
3	JK-special	5	MR
4	Mahy sylvia	5	MR
5	Chetak	7	MS
6	Mangalore local	9	HS
7	Malini	5	MR
8	Shirakawa	5	MR
9	Dharwad green	9	HS
10	Yummy	5	MR
11	Kareena	5	MR
12	Green long	5	MR
13	Ajeeth	5	MR
14	White long	5	MR
15	Gullakai	7	MS
16	Encounter-962	5	MR
17	Chitra	9	HS
18	Khushi	7	MS
19	Shalini	5	MR
20	Sribasava	7	MS
21	Ranebennur local	5	MR
22	Harini	7	MS
23	Sarpana hybrid	5	MR

MR – Moderately resistant MS – Moderately susceptible HS – Highly susceptible

Table.2 Grouping of cucumber genotypes based on reaction against powdery mildew caused by *Erysiphe cichoracearum*

Grade	Reaction	Per cent infection	Entries	No. of genotypes
0	I	0	-	0
1	HR	Up to 1	-	0
3	R	1-10	-	0
5	MR	11-25	Swathi, BSS-949, JK-special, Mahy Sylvia, Malini, Shirakawa, Yummy, Kareena, Green long, Ajeeth-99, White long, Encounter-962, Shalini, Ranebennur local, Sarpana hybrid.	15
7	MS	26-50	Chetak, Gullakai, Khushi, Sribasava, Harini.	5
9	HS	More than 51	Chitra, Dharwad green, Mangalore local	3

List of genotypes used for screening

Sl. No	Genotypes	Source	Place
1	Swathi	Bioseeds Pvt. Ltd.	Hyderabad
2	BSS-949	Kalash seeds pvt. Ltd	Jalna, Maharashtra
3	JK-special	Agro inputs Pvt. Ltd.	Ahmedabad
4	Mahy sylvia	Mahyco seeds Pvt. Ltd.	Jalna, Maharashtra
5	Chetak	Trusted seeds Pvt. Ltd.	New Delhi
6	Mangalore local	Keyonics seeds Pvt. Ltd.	Bangalore
7	Malini	Monsanto Pvt. Ltd.	Ahmedabad
8	Shirakawa	Sakata seeds Pvt. Ltd.	Gurugram, Haryana
9	Dharwad green	Nadakatti seeds Pvt. Ltd.	Dharwad
10	Yummy	Bioseeds Pvt. Ltd.	Hyderabad
11	Kareena	Nuziveedu seeds Pvt. Ltd.	Hyderabad
12	Green long	Ceres Pvt. Ltd.	Kolkata, West Bengal
13	Ajeeth-99	Ajeeth seeds Pvt. Ltd.	Aurangabad, Maharashtra
14	White long	Keyonic seeds Pvt. Ltd.	Bangalore
15	Gullakai	Mrutyunjaya seeds Pvt. Ltd.	Dharwad
16	Encounter-962	East west seeds India Pvt. Ltd.	Aurangabad, Maharashtra
17	Chitra-	RASI seeds Pvt. Ltd.	Hyderabad
18	Khushi	Dhanvi seeds Pvt. Ltd.	Hyderabad
19	Shalini	Ocean crop science Pvt. Ltd.	New Delhi
20	Sribasava	Tanindo seeds Pvt. Ltd.	Kodigehalli, Bangalore
21	Ranebennur local	Keyonic seeds	Bangalore
22	Harini	Noble seeds Pvt. Ltd.	Bangalore
23	Sarpana hybrid	Sarpan hybrid seeds Pvt. Ltd.	Dharwad

Per cent disease index (PDI)

Score	Description
0	No symptom of powdery mildew on leaves.
1	Small scattered powdery mildew specks covering 1 % or less leaf area.
3	Small powdery lesions covering 1-10 % of leaf area.
5	Powdery lesions enlarged covering 11-25 % of leaf area.
7	Powdery lesions coalesce to form big patches covering 26-50 % leaf area.
9	Big powdery patches covering 51 % or more of leaf area and defoliation occur

Per cent disease index (PDI) was calculated by using formula given by Wheeler (1969).

The results of screening of cucumber genotypes against powdery mildew which reveals that, out of twenty three genotypes screened under artificial epiphytotic condition, none of them were found immune and resistant, however, fifteen genotypes *viz.*, Swathi, BSS-949, JK-special, Mahy Sylvia, Malini, Shirakawa, Yummy, Kareena, Green long, Ajeeth-99, White long, Encounter-962, Shalini, Ranebennur local and Sarpan hybrid were found to be moderately resistant and five genotypes *viz.*, Chetak, Gullakai, Khushi, Sribasava and Harini were found to be moderately susceptible. With 9 grades in 0-9 scale genotypes such as Mangalore local, Dharwad green and Chitra showed highly susceptible reaction.

References

Anonymous, 2015-16, Handbook of horticulture statistics, GOI, Ministry of agriculture. Department of agricultural sciences and co-operation. New Delhi. pp: 14-16.

Awad, N. G. H., 2000, Reaction of some cucurbits against physiological and histopathological changes. *Arab Univ. J. Agric. Sci.,* 8: 829-851.

Gondi, S., 2015, Evaluation of oriental pickling melon genotypes for northern dry of Karnataka. *M. Sc* (*Hort.) Thesis*, Univ. Horti. Sci., Bagalkot, Karnataka. (India).

Mayee, C. D. and Datar, V. V., 1986, *Phytopathopmety. Technical Bulletin-1* (special bulletin-3), Marathwada Agricultural University, Parbhani, Maharasthra, India, PP: 29.

Pitchaimuthu, M. K., Souravi, Ganeshan, G., Kumar, S. and Pushpalatha, R., 2012, Identification of sources of resistance to powdery and downy mildew diseases in cucumber (*Cucumis sativus* L.) *Pes. Manag. Horti. Ecosys.,* 18 (1): 105-107.

Sitterly, W. R., 1972, Powdery Mildews of Cucurbits. In: *The Powdery Mildews,* D. M Spencer ed. Academic Press Inc. Ltd., New York. PP: 359-379.

How to cite this article:

Parameshwar Naik H. and Shripad Kulkarni. 2018. Screening of Cucumber Genotypes against Powdery Mildew. *Int.J.Curr.Microbiol.App.Sci.* 7(04): 414-418.
doi: https://doi.org/10.20546/ijcmas.2018.704.047