J. Farm Sci., 36(1): (47-49) 2023

RESEARCH PAPER

Prevalence of mungbean yellow mosaic virus on greengram in northern parts of Karnataka*

ROHIT MALLAPPA KARCHI[1], GURUPAD B. BALOL[1] , B. K. LOKESH[1] AND SUMA MOGALI[2]

[1]Department of Plant Pathology, [2]Department of Genetics and Plant Breeding
College of Agriculture,University of Agricultural Sciences, Dharwad - 580 005, Karnataka, India
E- mail: rohitkarchi98@gmail.com

(Received: September, 2022 ; Accepted: Februrary, 2023)

Abstract: Globally, mungbean yellow mosaic disease acting as a major constraint of greengram production. Its incidence is also gradually increasing in northern parts Karnataka. Mungbean yellow mosaic disease has peculiar symptoms like initially yellow-coloured spots scattered on young leaves followed by yellow mosaic pattern and puckering and slow drying of yellow leaves and wither. Infected plants bear few flowers and pods with some immature and deformed seeds. Pods of the infected plants were reduced in size and turned yellow in colour. Roving survey was conducted for two seasons, *viz*., *kharif* 2021 and summer 2021-22 to know per cent disease incidence in Bagalkot, Belagavi, Dharwad, and Gadag districts of northern parts of Karnataka. Among the four districts, average maximum incidence of 16.85 per cent was recorded in Gadag followed by Dharwad (15.01%), whereas the lowest incidence of 11.58 per cent was noticed in Bagalkot district during *kharif.* Maximum incidence of 30.10 per cent was recorded in Dharwad followed by Belagavi (25.02%), whereas the lowest incidence of 20.59 per cent was noticed in Bagalkot district during summer.

Key words: Greengram, Incidence, Mungbean yellow mosaic virus (MYMV), Survey

Introduction

Greengram (*Vigna radiata* (L.) Wilczek) is indigenous to India or Indo-Burma region and is the third most important self pollinated, short-duration grain legume crop after chickpea and pigeonpea. India is the major producer of greengram in the world and grown in almost all the States. It is grown in about 36 lakh hectares with the total production of about 17 lakh tonnes of grain with a productivity of about 500 kg/ha. Greengram is an excellent source of high quality protein (25%) having high digestibility.

Greengram production is affected by several biotic stresses *i.e.*, pest and diseases. So far 20 diseases of greengram have been documented; among them viral diseases are the most detrimental. Yellow mosaic is the utmost destructive yield reducing viral disease of greengram. The overall crop yield loss may range between 10 and 100%, depending on the greengram genotype and stage of crop infection (Bashir *et al.*, 2006).

Mungbean yellow mosaic virus (MYKV) was first reported in India (1955), in greengram fields at the experimental farm of the Indian Agricultural Research Institute, New Delhi. Nariani (1960) described the YMD on greengram and linked it with the virus. Later it was confirmed from different countries *viz*., Bangladesh (Jalaluddin and Shaikh, 1981), Thailand (Thongmeearkom *et al.,* 1981) and Sri Lanka (Shivanathan, 1977).

MYMV is considered as a serious problem in major greengram growing areas of northern parts of Karnataka. Therefore, the present study was carried out to know the prevalence of mungbean yellow mosaic disease in northern parts of Karnataka

Material and methods

Roving survey was conducted during *kharif* (12 taluks) and summer (11 taluks) to record the incidence of MYMV in, Bagalakot, Belagavi, Dharwad and Gadag districts of northern parts of Karnataka. In each Taluk of above districts, five fields were selected. The per cent disease incidence (PDI) was assessed by recording the number of plants showing disease symptoms and the total number of plants examined by using the formula (Wheeler, 1969)

$$\text{Percent disease incidence} = \frac{\text{Total number of infected plants}}{\text{Total number of plants observed}} \times 100$$

Results and discussion

During the survey it was noticed that different kinds of symptoms appeared in the fields of greengram *viz.,* initially yellow-coloured spots scattered on young leaves followed by yellow mosaic pattern and puckering and slow drying of yellow leaves and wither (Plate.1). Infected plants bear few flowers and pods with some immature and deformed seeds. Pods of the infected plants are reduced in size and turn yellow in colour.

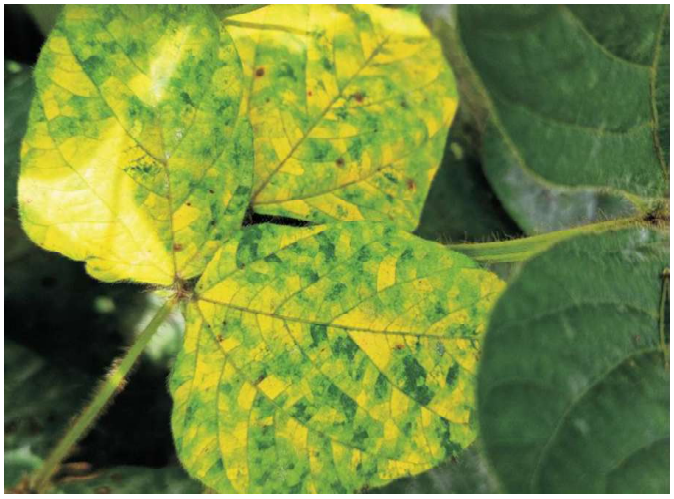
Among the different locations surveyed, during *kharif* 2021,incidence of yellow mosaic disease varied from 10.15-25.10 percent with the mean incidence of 14.07 per cent. Among the four districts, average maximum incidence of 16.85 per cent was recorded in Gadag, whereas the lowest incidence of 11.58 per cent was noticed in Bagalkot district. The taluk and district wise disease incidence during *kharif* 2021 is presented in table 1. Similar results reported by Meti *et al. (*2017), who conducted survey to know the incidence and present status of MYMV in greengram among the six districts of North Eastern Karnataka (NEK) region *viz*., Bellary, Bidar, Koppal, Kalaburgi, Raichur and Yadgir during *kharif* 2016. Highest disease incidence was recorded in Koppal district with 33.33 per cent followed by Bellary (21.45%), Raichur (19.70%), Kalaburgi (17.44%) and Yadgir (15.76%) districts. The least disease incidence was noticed in Bidar district (5.66%).

Table 1.Taluk wise mean per cent disease incidence of MYMV during *kharif* 2021

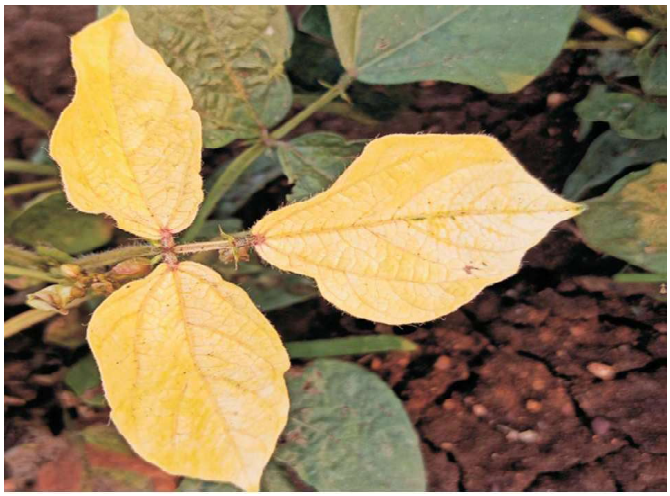
Taluk	Incidence average
Bagalkot : District	
Jamkahandi	11.00
Hunugund	12.14
Badami	11.62
	Mean = 11.58
Belagavi: District	
Athani	13.18
Kagawad	11.53
Bailhongal	14.77
	Mean = 13.16
Dharwad: District	
Dharwad	17.39
Kalghatgi	15.33
Hubbli	12.31
	Mean = 15.01
Gadag: District	
Lakshmeswar	18.72
Gadag	15.26
Ron	16.56
	Mean =16.85

Table 2. Taluk wise per cent incidence of MYMV during summer 2021-22

Taluk	Incidence (%)
Bagalkot : District	
Jamkahandi	21.20
Hunugund	20.66
Badami	19.93
	Mean = 20.59
Belagavi: District	
Bailhongal	27.24
Kagawad	23.59
Gokak	24.25
	Mean = 25.02
Dharwad: District	
Dharwad	39.33
Navalgund	26.32
Hubbli	24.67
	Mean = 30.10
Gadag: District	
Gadag	24.20
Ron	22.07
	Mean = 23.13



a) Mosaic



b) Complete yellowing of leaves

C) Yellow pods

D) Leaf puckering

Plate 1. Different Symptoms of MYMV disease observed on greengram during survey

Survey conducted in different villages of northern parts of Karnataka during summer 2021-22 showed that incidence of yellow mosaic disease during summer 2021-22 varied from 16.30 to 50.45 per cent with the mean incidence of 24.71per cent. Among the four districts surveyed, maximum incidence of 30.10 per cent was recorded in Dharwad followed by Belagavi (25.02 %), whereas the lowest incidence of 20.59 per cent was noticed in Bagalkot district. The taluk and district wise disease incidence during summer 2021-22 is presented in table 2. Similar results were reported by Sharmath Sofi (2020) who conducted survey during summer 2020 in Chikkamagaluru, Chitradurga, Davanagere and Shivamogga district, revealed the occurrence of disease in the range of 6.80 to 58.18 per cent. Among the districts surveyed, the highest disease incidence of 38.14 per cent and lowest incidence of 17.11 per cent were recorded in Chitradurga district and Shivamogga district, respectively.

In the event of considering the both the seasons more incidenceswere recorded in summer 2021-22 (16.30 to 50.45%) when compared to *kharif* 2021(10.15 – 25.10%). Similar results were reported by Rekha (2017) who conducted. Survey of four districts (Belagavi, Dharwad, Haveri, Gadag) in *kharif* 2016 and summer 2017. During *kharif* 2016, the highest incidence (16.12%) was recorded in Haveri and the least incidence (11.7%) was recorded in Gadag. During summer 2017, highest incidence (22.54%) was recorded in Dharwad and the least incidence (20.73%) was recorded in Belagavi.

Conclusion

The results of present study revealed that, incidence of mungbean yellow mosaic disease increased in the recent years and the variation in the incidence of disease is dependent on the vector incidence and environmental conditions.

References

Bashir M, Ahmad Z, Mansoor S, 2006, Occurrence and distribution of viral diseases of mungbean and mashbean in Punjab, Pakistan. *Pakistan Journal of Botany,* 38, 1341-1351.

Jalaluddin M and Shaikh M A Q, 1981, Evaluation of mungbean (*Vigana radiata* L.) germplasm for resistance to mungbean yellow mosaic virus. *Jouranal of Breeding and Genetics,* 13: 61-68.

Meti, Meghashree, Kenganal, Mallikarjun, Sunkad, Gururaj, Aswathanarayana, D S and Shanwad U K, 2017, Spatial variability of Mungbean Yellow Mosaic virus (MYMV) in North Eastern Karnataka. *International Journal of Plant Protection*, 10(2): 420-428.

Nariani T K, 1960, Yellow mosaic of mung (*Phaseolus aureus* L.). *Indian Phytopathology,* 13, 24-29.

Rekha A S, 2017, Studies on yellow mosaic disease on Mungbean [*Vigna radiata* (L.) Wilczek], *M.Sc. (Agri.) Thesis*, University of Agricultural Sciences, Dharwad, Karnataka, India.

Sharmath Sofi, 2020, Host resistance, detection and management of Mungbean yellow mosaic virus in mungbean (*Vigna radiata* L.). *M.Sc. (Agri.) Thesis*, University of Agricultural Sciences, Shivamogga

Shivanathan, 1977, *Tropical Agriulture Research* (Japan: Tropical Agriulture Research Center), 65-68.

Thongmeearkom P, Honda Y, Saito Y and Syamananda R, 1981, Nuclear ultra structural changes and aggregates of virus like particles in mungbean cells affected by mungbean yellow mosaic disease. *Phytopathology,* 71, 41-44.

Wheeler B E J, 1969, *An introdnction to plant diseases*. John Wiley and Sons Ltd, London, p. 301.