Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-11: 4060-4064

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-11 pp. 4060-4064**
Journal homepage: http://www.ijcmas.com

Original Research Article

Survey on Pomegranate Anthracnose caused by *Colletotrichum gloeosporioides* (Penz.) Penz. and Sacc. in Jabalpur (M.P.) Region

M. K. Mimrot[1*], U. K. Chanderia[2] and Rahul Dongre[2]

[1]Department of Plant Pathology, [2]Department of Horticulture, College of Agriculture, JNKVV, Jabalpur- 482 004, M.P., India
**Corresponding author*

A B S T R A C T

Pomegranate (*Punica granatum* L.) is an old table product of tropical and sub-tropical areas of the world. Pomegranate is native to Iran, where it was first cultivated in about 2000 BC and spread to the Mediterranean countries. India is the world's leading country in pomegranate production. In India, it is majorly cultivated in state of Maharashtra followed by Gujarat, Rajasthan, Tamil Nadu, Uttar Pradesh, Haryana, Andhra Pradesh and Karnataka. Maharashtra and Madhya Pradesh accounted maximum area under cultivation. It is regarded as the "Fruit of Paradise". The most popular varieties in India are Ganesh, Mridula, Arakta, Bhagwa (Kesar). Among fungal diseases anthracnose caused by *Colletotrichum gloeosporioides* is the most important disease on survey of pomegranate orchards was conducted during 2018-19 to assess the index of anthracnose on pomegranate in the farmer's fields in Shapura, Kundam, Patan and Sihora blocks on Jabalpur district. The per cent disease index (PDI) and disease index were recorded using 0-5 point scale. The maximum PDI on leaf was recorded in block Shapura (18.50%) followed by kundam (18.23%) while least PDI recorded in Sihora (9.52%). On fruit maximum PDI recorded in Shapura (20.33%) which least in Sihora (11.32%). The maximum mean PDI 16.09 percent on leaf and 18.70 percent on fruit was recorded on trees aged above 6 years.

Keywords

Pomegranate, *Colletotrichum gloeosporioides*, Azoxystrobin

Introduction

Pomegranate (*Punica granatum* L.) is an old table product of tropical and sub-tropical areas of the world. It belongs to the smallest botanical family *Punicaceae*. Pomegranate is a favourite table fruit of Mediterranean, tropical and subtropical regions of the world, grown commercially for its sweet acidic fruits and also for its medicinal properties. According to De Candole (1967) pomegranate originated in South West Asia, probably

Iran and some adjoining countries. Anthracnose caused by *Colletotrichum*

gloeosporioides (Penz.) Penz. and Sacc. is the major pre and post-harvest disease of pomegranate. Presently, very little literature is available in India on *Colletotrichum gloeosporioides* causing anthracnose of pomegranate fruit (Bose *et al.,* 1973). Apart from its demand for fresh fruits and juice, the processed products like wine, tea and candy are also gaining importance in world trade.

Pomegranate fruits are known to posses pharmaceutical and therapeutic properties. Pomegranate seeds are wealthy in oil, which have hormone creating impacts and stimulate estrogen hormone. The pre- dominant fatty acid reported was linolenic acid (31.8-86.6 %) Koba and Yanagita (2011).

Benagi *et al.,* (2009) conducted roving survey during *mrig-bahar* and *hasta-bahar* in 2008-09 in major pomegranate growing areas of north Karnataka to know the incidence and severity of diseases.

Anthracnose caused by *C gloeosporioides* (Penz.) Penz. and Sacc. is a serious disease of pomegranate in Gujarat, Haryana, Rajasthan, Karnataka, Tamil Nadu, Uttar Pradesh, Punjab and Haryana in India with economical loss 60.90 per cent yield loss in custard apple by anthracnose reported Gaikwad *et al.,* (2002).

Materials and Methods

The intensive roving survey was conducted in month of October and November during 2018 to know the severity of anthracnose in the farmers fields in Shapura, Kundam, Patan and Sihora blocks on Jabalpur district (M.P.).

In each block five villages were selected randomly. During survey various parameters like information about area of cultivation, type of varieties and occurrence of anthracnose disease and severity along with infected samples from each field were collected.

Field plants were selected in zigzag manner and the severity of anthracnose on leaf and fruit were recorded by using 0 to 5 scale (Wheeler, 1969).

The results analyzed after the survey reported that, fruits were more vulnerable to the attack by anthracnose caused by *C. gloeosporioides* than leaf as evidenced by more disease severity on fruits, irrespective of season, location and variety.

$$\text{Percent Disease Index (PDI)} = \frac{\text{Sum of the individual disease ratings}}{\text{Number of fruits/leaves observed} \times \text{Maximum disease grade}} \times 100$$

Results and Discussion

In each blocks, three to five villages were randomly selected and in each village one to three fields were randomly surveyed. In the field the plants were selected in a zigzag manner and the per cent disease incidence and disease severity on plant parts was recorded using a five point rating scale (0-5).

As per the data presented in Table 1.1, per cent disease index (PDI) on leaf was ranged from 9.52 to 18.50 per cent. Maximum per cent disease index of 18.50 per cent was recorded in village Harayi followed by Batai and Dharsni with percent disease index of 18.23 and 16.38 per cent respectively. The minimum per cent disease index of 9.52 per cent was recorded in Gosalpur.

Table.1

Grade	Area of infection (Per cent)		Reaction
	On fruits	On leaf	
0	No infection	No infection	Immune
1	1-10	Up to 5	Resistant
2	11-25	6-10	Moderately resistant
3	26-50	11-20	Moderately susceptible
4	51-75	21-50	Susceptible
5	>75	>50	Highly susceptible

Table.2 Survey on the severity of pomegranate anthracnose caused by *C. gloeosporioides* in major areas of around Jabalpur during 2018-19

S. No.	Block	Village	No. of Plants	Range (Grade)	Variety	Percent disease index	
						On leaf	On fruits
1.	**Bargi Shapura**	Mohas	1 Orchard (300)	0-2	Bhagwa	15.62	18.60
		Chargav	1 Orchard (250)	0-3	Bhagwa	16.23	----
		Haryi	2 Orchard (250,200)	0-4	Bhagwa	18.50	20.33
		Surai	1 Orchard (400)	0-2	Bhagwa	15.75	17.26
		Sunwara	1 Orchard (300)	0-3	Bhagwa	14.36	----
		Mean				16.09	18.70
2.	**Kundam**	Dadargawan	8	0-3	Bhagwa	12.69	14.26
		Khitota	12	0-3	Bhagwa	14.53	16.56
		Batai	1 Orchard(150)	0-4	Bhagwa	18.23	19.60
		Nawargawan	9	0-2	Bhagwa	11.26	13.63
		Hansapur	15	0-3	Bhagwa	15.28	17.56
		Mean				14.39	16.32
3.	**Patan**	Barhi	7	0-2	Bhagwa+ Local	12.24	----
		Gurupipaya	4	0-3	Local	14.18	15.69
		Shukha	5	0-2	Bhagwa	11.68	13.96
		Katra	6	0-2	Bhagwa+ Ganesh	11.95	12.59
		Bhelkheda	5	0-3	Local	13.20	15.23
		Mean				12.65	14.37
4.	**Sihora**	Gosalpur	6	0-2	Local	9.52	11.32
		Jujhari	4	0-3	Local	14.36	----
		Dharsni	8	0-3	Local	16.38	17.80
		Junmani	5	0-3	Local	13.20	16.26
		Fanwani	5	0-2	Local	16.33	----
		Mean				**13.96**	**15.12**

Fig.1 Survey on the severity of pomegranate anthracnose caused in major areas of around Jabalpur during 2018-19

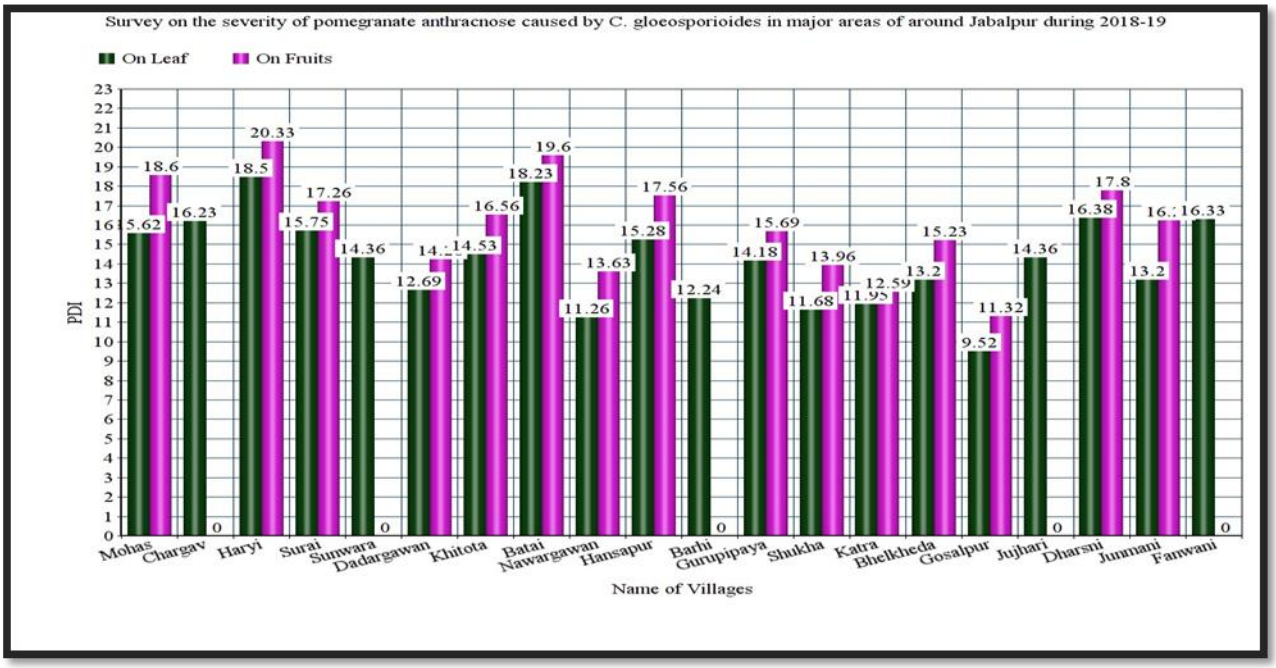

Fig.2 Block wise Percent Disease Index (PDI)

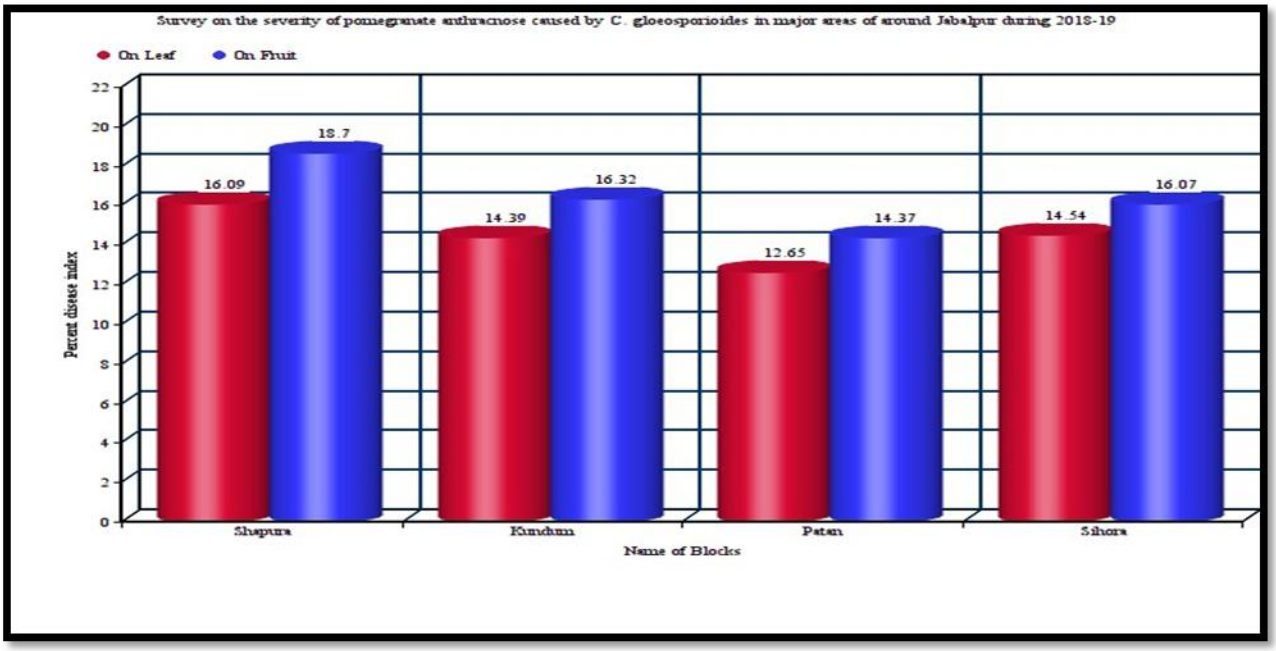

Table.3 Block wise Percent Disease Index (PDI)

Name of Block	Average Per cent Disease Index	
	On leaf	On Fruits
Shapura	16.09	18.70
Kundum	14.39	16.32
Patan	12.65	14.37
Sihora	14.54	16.07

On other hand the different locations, Per cent disease index on fruit ranged from 11.32 to 20.33 per cent. In Harayi, it was recorded highest 20.33 per cent followed by 19.60 per cent in Batai and 18.60 per cent in Mohas.

According to blocks wise at maximum mean percent disease index of 18.50 per cent was recorded in block Shapura while minimum 9.52 per cent was recorded in block Sihora.

The average per cent disease index was recorded on leaf and fruits in maximum found at 16.09 and 18.70 in Shapura block and minimum founded at 12.65 and 14.37 in Patan block respectively. (Table 1.2) The present findings are in agreement with Jayalashmi (2010).

The present findings were also in conformity with Padule and Kaulgud (1991) who reported that Arakta was more susceptible with more average disease severity on leaf (26.39 %), fruit (33.61 %). Although anthracnose was found prevalent in all the pomegranate growing areas surveyed, the occurrence and severity was probably more influenced by environmental conditions. The incidence of anthracnose increased with increase in age of the plant.

References

Benagi V I, Ravikumar M R, Gowdar S B and Basavaraj B B. 2009, Survey on diseases of pomegranate in northern Karnataka. Paper presented in; 2nd Int. Symp. Pomegranate and minor meditteranean fruit crop. University of Agricultural Science, Dharwad, India. 135 p.

Bose S K, Sindhnam G S and Pandey B N. 1973. Studies on the die back disease of mango in the Tarai region of Kumaon. Prog. Hort., 5: 41-53.

Gaikwad A P. 2002. Studies on fruit rot of custard apple caused by *Colletotrichum gloeosporioides* penz., Ph.D. Thes. M.P.K.V., Rahuri, Maharashtra, India.

Jayalakshmi K. 2010. Studies on anthracnose of pomegranate caused by *Colletotrichum gloeosporioides* (Penz.) Penz. and Sacc. Msc. Agric. Sci. Dharwad.

Koba K and Yanagita T. 2011. Potential health benefits of Pomegranate (*Punica granatum*) seed oil containing conjugated linolenic acid. Nuts and Seeds in Health and Disease Prevention, 919.

Padule D N and Kaulgud S N. 1991. Chemical control of leaf and fruit spots of pomegranate.Proc. 4" Annu. Zonal Meeting of Indian Phytopathology. Marathwada Univ. Aurangabad (India). November 1-2. pp 47-49.

Wheeler B E J. 1969. An Introduction to Plant Diseases, John Wiley and Sons Ltd. London. 301 p.