



ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(2): 716-718
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www.thepharmajournal.com
Received: 07-12-2021
Accepted: 13-01-2022

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Study on the effect of age of inoculum of *Sclerospora graminicola* (Sacc.) Schoret on downy mildew incidence in pearl millet

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Abstract

A study on disease, downy mildew of pearl millet was conducted at Rajasthan Agricultural Research Institute, Durgapura, Jaipur in which for study of effect of age of inoculum on disease incidence, one year to eight years old culture of *Sclerospora graminicola* was obtained from pearl millet downy mildew nursery, Rajasthan Agricultural Research Institute, Durgapura, Jaipur. It was observed from that one year old inoculum gave more disease incidence (98.66%) and the lowest seedling emergence (23.33%) than fresher one (95.33) and more than one year old inoculum.

Keywords: Inoculum, *Sclerospora graminicola*, Disease incidence

Introduction

Sclerospora graminicola is the type species of the genus. It was originally named as *Protomyces graminicola* by Saccardo in 1876 [4] who reported it on Setaria verticillata. Subsequently, Schroter in 1879 [5] renamed it as *Sclerospora graminicola* in his work on the genus *Sclerospora* in Germany (Ullstrup, 1973) [7]. Farlow (1884) [2] described *Sclerospora graminicola* on *S. viridis* (L.) Beauv. *Sclerospora graminicola* produces two types of spores, asexual spores known as sporangia and sexual spores known as oospores. The process of sexual reproduction in *Sclerospora graminicola* is initiated in antheridia (male) and oogonia (female), and culminates in the formation of oospores. Oospores are produced in large numbers. The oospore wall has three distinct layers: the exosporium, the mesosporium, and the endosporium. As a rule, in *Sclerospora* spp. the oogonial wall is fused with the oospore wall, which is a major identifying feature of this genus. Oospores are resting spores. The thick oospore wall protects them from desiccation, and probably serves as an impermeable membrane. Reports suggest that oospores can survive from 8 months to 10 years under laboratory conditions (Nene and Singh, 1976) [3]. Therefore, to check the infectivity of oospores in infected plant material (fresh to eight years) the present study was conducted.

Materials and Methods

For study of effect of age of inoculum on disease incidence, one year to 8 years old culture of *Sclerospora graminicola* was obtained from pearl millet downy mildew nursery, Rajasthan Agricultural Research Institute, Durgapura, Jaipur. Sterilized seeds of pearl millet cultivar (7042 S) were coated separately with fresh inoculum and one year to eight years old inoculum of *Sclerospora graminicola* respectively. Coated seeds were sown in pots at depth of 0.5 cm from soil surface. The pots were watered regularly as and needed. The experiment was conducted in a complete randomized design (CRD) with three replications. Downy mildew incidence was recorded 14 days post sowing and seedling emergence calculated using the formula as given below:

$$\text{Per cent seed emergence} = \frac{\text{Number of seeds germinates}}{\text{Total number of seeds sown}} \times 100$$

Results and Discussion

For study of effect of age of inoculum on disease incidence, one year to eight years old culture of *Sclerospora graminicola* was obtained from pearl millet downy mildew nursery, Rajasthan Agricultural Research Institute, Durgapura, Jaipur.

It was observed from table 1 that one year old inoculum gave more disease incidence (98.66%) and the lowest seedling emergence (23.33%) than fresher one (95.33) and more than one year old inoculum (Fig 1). Similar results were also reported by Bhat (1973) [1] Suryanarayana (1956) [6].

Table 1 Effect of age of inoculum on downy mildew incidence caused by *Sclerospora graminicola*

Sr. No.	Age of Inoculum (Yr)	No. of seeds sowing	Plant population (Mean)	Seed emergence (%)	No. of plants infected	DM Incidence (%)
1.	Fresh	50	20.0	40.0 (39.21)*	47.66	95.33 (77.55)
2	1	50	11.66	23.33 (28.84)	49.33	98.66 (84.55)
3	2	50	22.0	44.0 (41.53)	45.33	90.66 (72.20)
4	3	50	25.33	50.66 (45.36)	43.0	86.0 (68.03)
5	4	50	28.33	56.66 (48.81)	41.33	82.66 (65.37)
6	5	50	32.33	64.66 (53.52)	39.0	78.0 (62.02)
7	6	50	35.0	70.0 (56.77)	37.0	74.0 (59.33)
8	7	50	36.33	72.66 (58.47)	33.0	66.0 (54.31)
9	8	50	37.66	75.33 (60.20)	29.66	59.33 (50.36)
	CD @5%	-	1.99	(2.29)	1.43	(3.48)
	SEm±	-	0.68	(0.76)	0.47	(1.15)
	CV%	-	4.18	(2.73)	2.02	(3.02)

Mean of three replications

* Figures in parentheses are angular transformed values

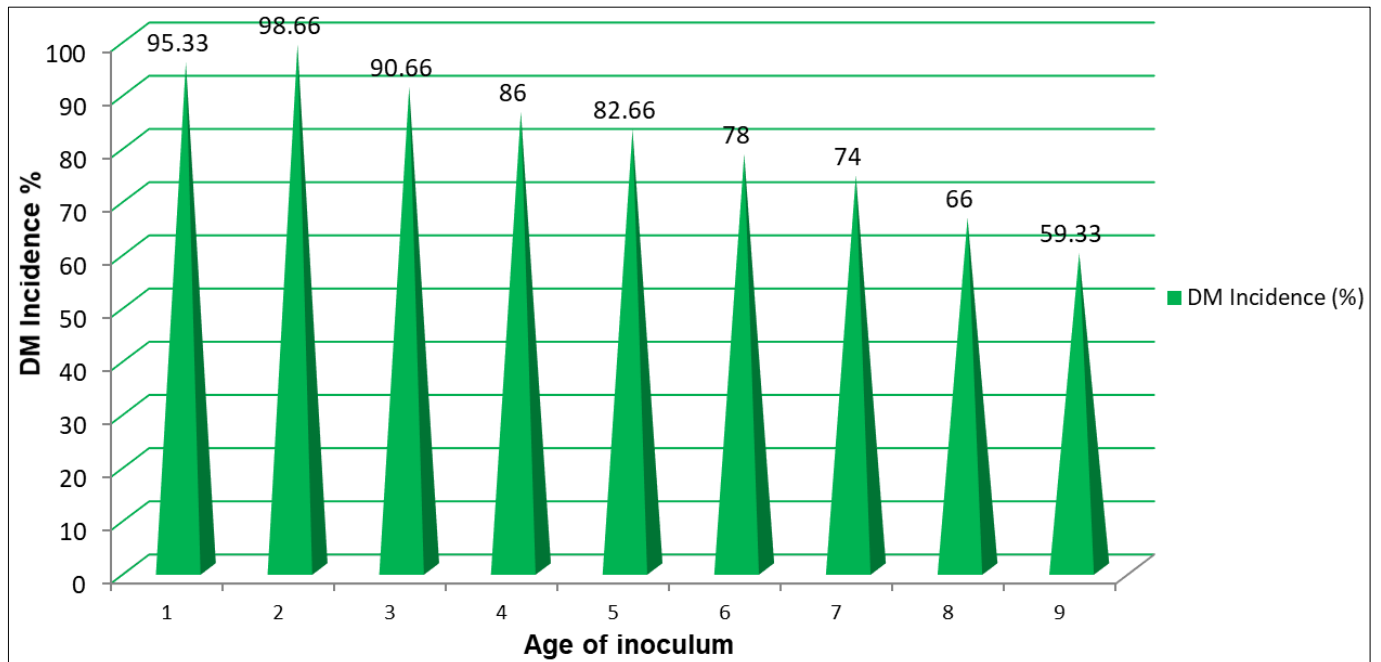


Fig 1: Effect of age of inoculum on downy mildew incidence caused by *Sclerospra graminicola*

Conclusion

From the experimental results it was concluded that the age of inoculum of pathogen, *Sclerospora graminicola* (Sacc.) Schoret has effect on downy mildew incidence.

Acknowledgement

The authors are grateful to Director and Head, Division of Plant Pathology, Rajasthan Agricultural Research Institute,

Durgapura, SKN Agriculture University- Jobner for providing necessary facilities to carry out the experiment.

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