



Research Note :

## EFFECT OF DIFFERENT MEDIA, pH AND TEMPERATURE ON GROWTH AND SPORULATION OF CURVULARIA LEAF SPOT OF BRINJAL

[*Solanum melongena* (L)].

P. C. Singh<sup>1</sup>, P. P. Tripathi<sup>2</sup> and Ramesh Singh<sup>3</sup>

<sup>1</sup>Deptt.of Plant Pathology, T.D.P.G. College Jaunpur - 220020

<sup>2</sup>Krishi Vigyan Kendra, East Kameng -790 102

\*Corresponding Author's E-mail: mr.mksingh2008@rediffmail.com

**ABSTRACT** : *Curvularia* leaf spot of brinjal (*Solanum melongena*.) was grown on nine different solid media to observed the radial growth of the test fungus. Potato Dextrose Agar medium, favored the maximum growth and lowest growth was recorded on Asthana and Howker's medium. The temperature requirement of the pathogen was investigated on Potato Dextrose Agar medium, in the range of 8°C to 45°C. The fungus exhibited maximum growth at a wide range of pH from 3.5 to 9.0, and best fungal growth was recorded at 6.5 and poor growth was observed at pH 3.5.

**Keywords** : Temperature, ph, growth and sporulation

The Brinjal (*Solanum melongena* L.) popularly known as "Egg plant" it is also known as *Baigan*. Its belong to the family Solanaceae. The Brinjal is known to had its origin from the tropical region of India and China. The brinjal is a native of India. The brinjal is very important and popular vegetable crop in India. This is grown all over the country. The Brinjal fruits are used as vegetable and also used in a making pickle and Ayurvedic medicinal properties. The Brinjal crop has good medicinal value. There are several varieties of Brinjal under cultivation and their reaction to various disease varies considerably, from highly susceptible to relatively resistant. More than ten disease are reported on the Brinjal in this country. The Brinjal crop is known to suffer from a no of viral nematodes, mycoplasma, fungal and bacterial disease. The fungal diseases consider to be the major factor responsible for reducing the yield (Lal *et al.*, 1, Menaria, 2). Among the fungal disease of *Curvularia* leaf spot of Brinjal caused by *Curvularia lunata* are most important disease in India (Pandey, 3) . The symptoms of disease were first observed in young during the winter season October and November. They get small irregular, brown spot on the leaves which turn dull-dark brown with age. The most conspicuous symptoms of the disease were on the bigger leaves area. The spot are the scattered on all over the leaves. The present study was under taken

to observe the effect of different media, pH and temperature on the growth and sporulation of the test fungus *Curvularia lunata*.

For measuring radial growth of pathogen 20 ml. of sterilized Agar medium was poured in 9.0 cm diameter of sterilized Petridis. After the medium solidified 5 mm dish of fungal growth was cut with the help of sterilized cork borer and placed at the center of each Petridis. These petridishes were incubated at 25°C to 28°C up to required incubation period. Each treatment was replicated three times. The fungal growth was observed daily and final diameter of the fungus growth was measured manually at the 10 days.

The study was conducted on the best-suited semi synthetic medium Potato Dextrose Agar medium (PDA). The conical flask (150 ml.) containing 50 ml. medium were taken and these flasks were sterilized at 1.1kg pressure/cm for 20 minutes in an autoclave. These sterilized flasks with the medium were inoculated with 10 days old culture of the pathogen in equal quantities (5 mm. pieces) made with help of a sterilized cork borer. These flasks were then incubated at different temperature viz., 8, 10, 15, 20, 25, 28, 30, 35, 40 and 45°C for 10 days. Each treatment had three replication. After 10 days of incubation, the medium containing mycelium mats was filtered through weighted what mean's filter paper No.- 42 and these filter paper with the mycelial mat were dried in hot air oven at 60°C for 24 hour. The weight was taken

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separately at different temperature. The net dry weight of the filter paper from total weight of the each case was deducted. Sporulation of the fungus on different media was graded accordingly.

Potato Dextrose Agar medium was also used for the study of hydrogen- ion concentration for the growth and sporulation of the fungus. The pH of medium was adjusted to desired level with the help of Phillip's pH meter by using N/10 hydrochloric acid sodium hydroxide for lower and higher pH value respectively. The pH more adjusted on 3.5, 4.0, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, and 9.0, 50 ml. of the adjusted medium was poured in 150ml conical flask and sterilized at 1.1kg pressure/cm for 20 minutes in an autoclave. Each treatment was replicated for four times. The flask inoculated with 10 days old culture of the pathogen in equal quantities (5 mm. disc) made with help of sterilized cork borer and were then incubated for 5 days at 25°C to 28°C for further growth and sporulation of fungus. After incubation in the medium containing the mycelium mats of the pathogen was filtered and oven dried at 60°C for 48 hour and weighted and average dry weight was obtained in the usual manner.

**Effect of different media on the growth of the pathogen**

Data represented in Table 1 revealed that the best growth of the fungus was obtained on Potato Dextrose Agar medium followed by Oat meal agar medium which were statistically superior to other media tested and significantly differentiated from each other. The next best medium was Richard's Agar medium followed by Czapek (Dox) Agar medium and they were statically similar to each other. The rest of media found in the order of performance were Coon's Agar, Brinjal leaf decoction, Brown Starch Agar and Asthana and Howker's Agar medium. These were statistically at par to each other. The Brown Starch Agar medium and Asthana and Howker's Agar medium supported poor growth of the fungus.

It is also evident (Table 1) that excellent sporulation of the fungus was recorded on Potato Dextrose Agar and Richards medium. Sporulation was good on Oat meal medium, Czapek (Dox) medium, Brinjal leaf decoction medium and Coon's medium. Sporulation was fair on Brown Starch medium, while poor sporulation was observed on Asthana and Howker's Agar medium.

**Table 1: Redial growth and sporulation of *Curvularia lunata* on different solid media after 8 days of incubation at 28 ± 1°C.**

Name of Media	Average diameter of colonies s(mm)	Sporulation
Potato Dextrose Agar	90.00	+ + + +
Oat Meal Agar	88.00	+ + +
Richard's Agar	85.00	+ + + +
Czapek's (Dox) Agar	82.00	+ + +
Coon's Agar	76.00	+ + +
Brinjal Leaf Decoction	74.00	+ + +
Brown's Starch Agar	46.00	+ +
Asthana and Hawker's Agar	38.00	+
C.D. (P = 0.05)		3.46

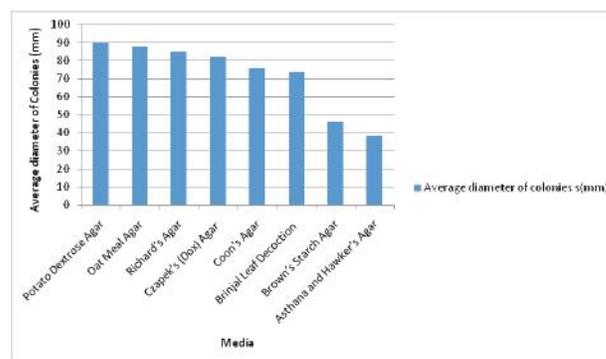


Fig. 1 : Effect of different temperature on the growth and sporulation of fungus.

The fungus presented in Table 2 indicated that the fungus was able to grow at wide temperature range of 8 to 45°C. The optimum temperature for the growth of fungus was 28°C followed by 30°C. Better growth was obtained at 25°C to 30°C the fungal growth was good at 20°C than at 35°C. The minimum growth (46.20%) at 45°. The excellent sporulation was observed at 25°C, 28°C and 30OC. which also supported the best fungal growth. Temperature 20°C supported good sporulation. Other temperature sporulation was fair to poor. There was no sporulation at 8°C and 45°C.

**Table 2: Fungal dry weight and sporulation of *Curvularia lunata* on different temperature after 10 days of incubation.**

Temperature °C	Average dry mycelia weight (mg)	Sporulation
8	86.50	-
10	142.60	+
15	270.00	+ +

20	493.50	+++
25	714.70	++++
28	733.83	++++
30	720.75	++++
35	413.00	++
40	418.12	+
45	46.20	-
C.D. (P = 0.05)	3.408	

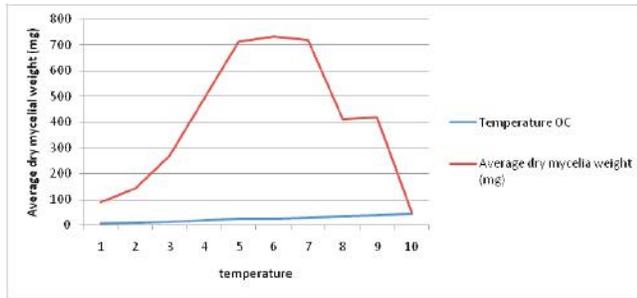


Fig. 2 : Effect of temperature on dry mycelial weight.

**Effect of different hydrogen-ion concentration on the growth and sporulation of fungus:**

The data presented in the Table 3 that maximum fungal growth occurred at 6.5 followed by pH 6.0. The optimum pH range for fungal growth was from 6.0 to 6.5. There was also significant reduced in growth at pH lower that 6.0 and higher 6.5, lower fungal growth was recorded at pH level of 3.5 to 5.5 as compared to pH level 7.0 to 8.5. The lowest fungal growth was noticed at pH 9.0. Excellent sporulation was observed at pH level 6.0 and 6.5. Good sporulation was recorded at 5.0, 5.5 and 7.0 pH level. It is interesting to note that as the acidity of the medium increase the growth up to pH 6.5 goes on increasing but as the alkalinity of the medium increase the growth goes on decreasing. This suggests that the pathogen like acidic medium in compression to alkaline.

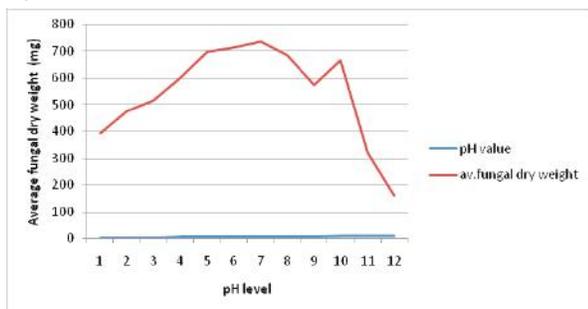


Fig. 3 : Effect of pH level in fungal dry weight.

**Table 3 : Average fungal dry weight and sporulation of *Curvularia lunata* on different pH level after 10 days of incubation at 28 ±1°C.**

pH level	Average fungal dry weight (mg)	Sporulation
3.5	394.00	+
4.0	476.06	++
4.5	517.50	++
5.0	600.00	+++
5.5	696.92	+++
6.0	714.25	++++
6.5	735.33	++++
7.0	684.10	+++
7.5	574.50	++
8.0	666.26	++
8.5	322.00	++
9.0	162.24	+
C.D. (P = 0.05)	3.374	

**REFERENCE**

1. Lal M., Ali M., Kumar S., Singh V., and Khan A. (2014). Effect of media, nitrogen sources and temperature on the growth and sporulation of *Curvularia lunata* causing *Curvularia* leaf spot of black gram. *The Bioscan*, 9(3), 1197-1199.
2. Menaria D. (2011). Patho-physiological studies on *Curvularia* fruit rot of bell pepper ( Doctoral dissertation,MPUAT, Udaipur). *Krishikosh. egranth. ac.in*
3. Pandey A. (2010). Studies on fungal diseases of eggplant in relation to statistical analysis and making of a disease calendar. *Recent Res. Sci. Tech.*, 2(9).



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