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FURTHER STUDIES ON THE LEAF-SPOT DISEASE OF *AGAVE AMERICANA* L. CAUSED BY *ALTERNARIA TENUIS* AUCT.

Mukherjee and Mukherji (1969) first reported the occurrence of *Alternaria tenuis* Auct on *Agave americana* L. Further studies on the pathogen as regards its host range and effect of different pH, temperatures, humidity on its growth were undertaken. The results are presented here.

The culture of *A. tenuis* Auct. used in the present studies was isolated from fresh leaf spot of *Agave americana* L. Host range of the organism was studied by spray inoculation of spores and mycelia on leaves of different hosts selected for the purpose in a moist chamber. The effect of different pH on growth was studied in Asthana-Hawkin's medium by adding desired amount of N/10 Hydrochloric acid and N/10 Sodium hydroxide solutions to obtain the desired pH range of 5.0 to 8.5. The effect of different media and different temperatures on the growth of *A. tenuis* was studied with P.D.A., Czapex Dox agar, Brown's Synthetic agar, Oat meal agar and Richard's agar media. The inoculated petri-plates were incubated at temperatures of 25°C, 35°C and 40°C during the experimental period.

The effect of different humidity on the growth of *A. tenuis* was studied by allowing the fungus to grow on P. D. A. plates kept under different humidity conditions.

The results obtained during the experimental period are given below.

a) *Host-range* : To study the host range of *A. tenuis* different crops e. g. Chilli (*Capsicum annum* L.) Brinjal (*Solanum melongana* L.), Gourd (*Cucurbita maxima Duch.*), Sesame (*Sesamum orientale* L.), Mango (*Mangifera indica* L.), Lily (*Crinum asiaticum* L.), Maize (*Zea mays* L.), Tube-rose (*Polyanthus tuberosa* L.), Papaya (*Carica Papaya* L.) and Jowar (*Serghum vulgare* P.) were kept in a moist

chamber and inoculated with a spray inoculation of spores and mycelium of the fungus. Observations on the symptom expression were made after 15 days following inoculation.

Among the test plants, *Solanum melongana* L., *Capsicum annum* L., *Polyanthus tuberosa* L., *Crinum asiaticum asiaticum* L., *Mangifera indica* L. and *Sesamum orientale* L. could infested with the pathogen.

b) *Effect of pH.* : The effect of different pH on the growth and sporulation of *A. tenuis* was studied on Asthana-Hawkins liquid medium in 250 ml conical flasks each containing 50ml of the medium adjusted with N/10 HCl and NaOH respectively. Three flasks were used for each pH value. The flasks were incubated for 9 days at 30°C.

After 9 days the mycelial growth on different pH values were determined on the basis of dry weight of the mycelium as presented in Table 1. The data indicated that with the increase in pH value there was corresponding increase in the weight of the mycelium. Maximum growth and sporulation were obtained at pH 8.0. Misra and Nema (1969) reported that the optimum pH for *A. tenuis*, was 6.5 to 7.5 isolated the optimum pH,

Table 1. *Data showing the dry weight of the mycelium and sporulation at different pH*

pH value	Dry weight of mycelia (in mg.)	Sporulation*
5.0	30.30	+
5.0	30.50	+
6.0	42 2	++
6.5	40.3	++
7.0	47	++
7.5	47.4	++
8.0	61.2	+++
8.5	40.7	++

* + Low, ++ Moderate, +++ Heavy.

c) *Effect of different* media on growth in relation to temperature.

A. tenuis was grown on different media in the petri-plates in triplicates for each temperature. Colony diameter was measured on the sixth day after inoculation. The results are tabulated in Table 2.

Table 2. *Data showing the effect of media and temperature on growth of* A. tenuis

Media	Colony diameter (in mm.) on the sixth day Temperature (°c)			
	25	30	35	40
Potato dextrose agar	58.20	60.10	62.60	...
Czapex Dox agar	53.50	61.40	61.00	...
Brown's Synthetic agar	50.00	41.40	41.10	...
Oat meal agar	50.70	55.80	45.00	...
Richard's agar	48.70	33.10	35.00	...

The optimum temperature for growth appeared to be different for different media. In PDA, The optimum temperature for growth was found to be 35°C, 30°C and 25°C in PDA, Czapeck Dox and Oat meal agar, and Brown's Synthetic and Richard's agar media respectively. However There was no growth at 40°C. in any of the medium used.

d) Effect of humidity.

The effect of different humidity on the growth on the growth of *A. tenuis* was studied by growing it in P. D. A. in petri-plates under different humidity levels. Sulphuric acids of requisite concentrations were used for maintaining different levels of relative humidity between 20 to 100 percent inside belljars kept sealed with paraffine on glass plates.

It was noticed that with the increase in humidity level there was corresponding increase in mycelial growth. The data on redial growth are given in Table 3.

Table 3. *Data showing the effect of humidity on growth of* A. tenuis

Relative humidity (%)	Colony diameter on the sixth day (in mm.)
100	8.40
90	6.00
80	5.20
70	4.80
60	3.80
50	3.00
40	2.80
30	2.00
20	1.60

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REFERENCES

Misra A. B. and Nema K. C. (1969), Physiological studies on *Alternaria tenuis*. *PANS*, **15** : 568-572

Mukherjee Shanti and Mukherji S. K. (1969), A leaf disease of *Agave americana* caused by *alternaria tenuis*. *Pl. Dis. Reporter* **3** : 428-429.