
Cultural characteristics and host range of *Stemphylium lycopersici* causing leaf-spot of tomato

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Stemphylium lycopersici grew and sporulated well on potato dextrose agar but sporulation on nutrient agar and Thornton's agar media were nil and moderate respectively. When seven species of plants belonging to seven genera of five families were tested for collateral host, species belonging to only Solanaceae were susceptible with varying degree of severity. All the five varieties of tomato tested were found to be resistant to the fungus.

Key words : Tomato, *Stemphylium lycopersici*, leaf spot, collateral hosts

INTRODUCTION

During October 1985, tomato (*Lycopersicon esculentum* Mill.) plants (local variety) grown in the glass house of the University of Agricultural Sciences, Hebbal, Bangalore, were found to show foliar infection by a dematiaceous hyphomycete which on examination was found to be a species of *Stemphylium*. The temperature and humidity prevailing in the glass house during the period of infection were 27°C and 97 per cent R.H. Incidentally it was noticed that other plants such as, *Datura metel* Linn., *Nicotiana tabacum* Linn. (Solanaceae); *Acanthospermum hispidum* DC. and *Ageratum conyzoides* Linn. (Compositae) grown in the vicinity of tomato plants in the glass house as well as the local tomato variety grown outside the glass house in the field did not show any infection.

There are three species of *Stemphylium* reported to cause disease in tomato namely, *S. solani* Weber, *S. floridanum* Hannor & Weber and *S. lycopersici* (Enjoji) Yamamoto. The species recorded at Hebbal was identified as *lycopersici* (Ellis, 1971; Ellis *et al.*, 1975).

Since tomato is an important crop, especially in South India where it is grown throughout the year, it was thought worthwhile to study the fungus with regard to collateral hosts and varietal resistance.

MATERIAL AND METHODS

The fungus was easily isolated by dilution plating since it is an abundant sporulator.

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Koch's postulates were confirmed. As the fungus loses its capacity to sporulate by repeated sub-culturing when grown on potato dextrose agar (PDA), it was grown on steam sterilized twigs of the host where it sporulated profusely. Ten daysold culture was used for inoculation tests. PDA, nutrient agar and Thornton's agar media were prepared as advocated by Tuite (1969). The cultural characteristics of *Stemphylium lycopersici* were studied on these three media.

For studying the host range of the pathogen, plants belonging to different families (Table 2) were tested. For studying varietal resistance, five tomato varieties such as, Pusa Ruby, Karnataka Hybrid, K.A. Jatti, Punjab Chotia and S-12 were tested. Seedlings of these five tomato varieties and other host plants were grown in small pots in the glass house, when they were 1.5 months old, spot inoculations were made on young leaves at five places with the spore suspension of the fungus. The inoculated plants were placed in a humid chamber for 48 h. Afterwards inoculated plants were transferred to glass house. Pathogenicity test were repeated to confirm the results.

RESULTS AND DISCUSSION

On PDA the fungus grows very well at laboratory temperature of 26°C. Colony at first effuse, grey, velvety. Mycelium partly immersed and partly superficial. Aerial mycelium at first grey, later turns yellow to dark yellow in the centre, surrounded by greyish white mycelium which again is surrounded by light grey margin. Colony growth covers the petri plate in nine days. Reverse of the petri plate with olive centre surrounded by grey and light grey periphery. Colony smooth with circular margin. Good sporulation observed on the 11 day. After 16 days of incubation, the centre of the colony turns pinkish with raised mycelium. Corresponding to the raised pinkish centre the bottom of the petri plate turns reddish brown.

On nutrient agar, mycelium cottony, sparse and mostly submerged. Colony circular with wavy margin. No change in the colour of the medium Sectoring observed. Colony diameter reaches 75 mm after 12 days.

On Thornton's agar, mycelium sparse, cottony in the centre surrounded by light brown submerged mycelium. Colony circular with undulating margin. No change in the colour of the medium. Colony diameter reaches 80 mm after 12 days.

The growth of *S. lycopersici* on different media in terms of colony diameter is furnished in Table 1.

Ataide and Hegde (1986) noticed maximum radial growth of *S. lycopersici* on potato dextrose agar and maximum sporulation on safflower leaf extract.

Ninetyeight per cent of conidia germinated in tap water at 25°C producing upto 11 germ tubes at the end of 6.5 h.

From Table 2, it is seen that only plant species belonging to the family Solanceae are susceptible with varying degree of severity. It may, therefore, be possible that these plants may serve as collateral or alternative hosts for the pathogen.

Table 1. Colony diameter on different media

Culture media	Colony diameter* in mm					Sporulation
	Days of incubation					
	3rd	4th	7th	9th	10th	
PDA	17	30	60	77	89	Good
Nutrient agar	16	20	45	55	61	Nil
Thornton's agar	15	19	55	68	72	Moderate

* average of three replicates

Table 2. Tests for collateral hosts

Family and name of test plants	Reaction to test
Compositae	
1. <i>Carthamus tinctorius</i> Linn.	No infection
Iridaceae	
2. <i>Gladiolus</i> sp.	No infection
Liliaceae	
3. <i>Allium cepa</i> Linn.	No infection
Solanaceae	
4. <i>Capsicum Frutescens</i> Linn.	Moderate
5. <i>D.metel</i>	Severe
6. <i>L.esculentum</i> (control)	Severe
7. <i>N.tabacum</i>	Severe
8. <i>Solanum melongena</i> Linn.	Moderate

The different varieties of tomato tested i.e., Pusa Ruby, Karnataka Hybrid, K.A. Jatti, Punjab Chotia and S-12 did not take infection even when the inoculations were repeated three times.

Stemphylium lycopersici was first reported by Yamamoto in 1960 from Japan. However, Rotem *et al.* (1966) observed *Stemphylium botryosum* Wallr. f. sp. *lycopersici* Rotem, Cohen and Wahl on *Lycopersicon esculentum* from Israel. Sharma and Bhatnagar (1974) recorded *S. lycopersici* causing grey-leaf spot on tomato for the first time from Udaipur, India. Chau and Alvarez (1983) observed fruit rot of papaya caused by *S. lycopersici*.

Specimens were deposited in the herbaria of C.A.B. International Mycological Institute, Kew, U.K. (IMI 198913) and in the Department of Plant Pathology, G.K.V.K., U.A.S., Bangalore, India (MYSP-1970).

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