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RESEARCH ARTICLE

Cultural and Physiological Characterization of *Fusarium solani* f.sp. *melongenae* (Mart.) Sacc. Causing Brinjal Wilt

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ABSTRACT

Vascular wilt is infecting brinjal in all the growth stages of the crop development. Several studies showed that *Fusarium solani* f.sp.*melongenae* was commonly associated with vascular wilt. However, the characterization of the pathogenic species has not been resolved. This study was carried out to identify and characterize the nutritional requirement and physiological conditions required for the growth and development of *Fusarium solani*. Brinjal plants showing the typical fungal wilt disease symptoms were collected from six different growing areas of Tamil Nadu. The collected isolates were characterized and identified as fungal species *Fusarium solani.* All the strains differed in their morphological, cultural and physiological characters. Among the different isolates, MDCFSM1 isolate was identified as virulent isolate. All the isolates differed in conidial size and number of cells per conidium. The pathogen, *F.solani* showed maximum mycelial growth in Czapekdox medium both in liquid and solid medium. The maximum mycelial growth of pathogen was observed at pH 7.5. Among the different carbon and nitrogen sources *viz,* galactose, sucrose, urea and potassium nitrate, respectively, showed maximum mycelial growth.

Keywords: Brinjal, cultural characterization, *Fusarium solani*, physiological characterization, wilt

INTRODUCTION

Brinjal (*Solanum melongena* L.) belongs to family Solanaceae, and it is grown as an essential vegetable crop all over the world, mostly in the Indian subcontinent and South east Asia. It is grown in India over an area of 0.4 million hectares, with an annual production of 7.8 million tonnes (Datar,1999). Tamil Nadu has 8.84 thousand hectares and 1.74 lakh MT brinjal production. Among districts, the Vellore district occupies the highest area (1465 ha) followed by Tiruvannamalai, Coimbatore and Salem districts (IHD,2018). Among the different diseases that attack brinjal, wilt has become a significant disease, causing a substantial reduction in yield. Wilt of eggplant (brinjal) caused by *Fusarium oxysporum* f.sp.*melongenae* is a ubiquitous and highly damaging plant disease in India (Chakraborty *et al*., 2009). This disease occurs in all stages of crop growth. It becomes a significant disease as it causes significant yield loss of 70-92% (Joseph *et al*.,2008). The wilt of brinjal is characterized by yellowing of foliage and drooping of apical shoot leading to ultimate death of the whole plant. The pathogen is a soil-inhabiting fungus and forms senescing tissues of the diseased plant and may survive in the soil for many years. The genus *Fusarium* has been recorded in many parts of the world and considered as an important group of fungus because of its diversity and cosmopolitan distribution. They cause vascular wilts, crown rots, headlights, scabs, rootrots, and cankers in many economically important plants such as banana, cotton, legumes, maize, rice, wheat, and others (Summerell *et al*.,2003). Brinjal plants infected by *Fusarium oxysporum* f.sp.*melongenae* was observed by Matuo and Ishigami(1958) in parts of Japan. In India, Chattopadhyay and Sen Gupta(1956) first observed a wilt disease incited by *F.solani* (Mart.) Sacc.West Bengal.

The understanding of nutritional and physiological necessities is the foremost requisite in the culturing of any microorganism using cultural protocols. Carbon is a significant molecule to contribute oxygen and hydrogen supply for vegetative growth of an organism. Mostly, the media composition and physical factors are responsible for the growth of any microorganism. Tests on suitable growth conditions will lead to a better understanding of the pathogenic relationship by elucidating the ecological and physical requirements of spore production. There are different physical factors, such as culture media, temperature, pH, and nutrient (carbon and nitrogen sources) that affect the fungal mycelial growth. The

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present work was undertaken to study the effect of pH, different carbon and nitrogen sources of mycelial growth of *Fusarium solani* collected from wilt diseased brinjal plants for understanding the nutritional requirement and ecological survival of the pathogen.

MATERIAL AND METHODS

Collection of F.solani isolates

Fusarium solani was isolated from wilted brinjal plants in different brinjal grown areas of Tamil Nadu,*viz*., Madurai (Checkkanurani, Surakundu), Virudhunagar (Pudhur), Trichy (Kalapatti) and Dindugal (Nilakottai) and maintained in pure culture on potato dextrose agar (Chakraborty and Chatterjee, 2007). The infected portions of diseased plants were cut into small pieces using sterilized scalp and these were surface sterilized with 0.1 per cent mercuric chloride for one minute and washed three times in sterile distilled water and then placed on previously poured and solidified petri dish containing potato dextrose agar medium. These plates were incubated at room temperature(28±2ºC) for five days and observed for the growth of fungus. The hyphal tips of grown fungi pieces were transferred aseptically to PDA slants for maintenance of the culture. The pathogens were identified based on their cultural and morphological characters.

Pathogenicity test for F.solani isolates

Six isolates of *F.solani* collected from various locations were multiplied on sand maize medium (sand and ground maize grains mixed in the ratio of 19:1, moistened and autoclaved in saline bottles for two h) and incubated at 28±2ºC for 21 days. This sand maize culture was mixed with sterile soil at five per cent level and transferred to earthen pots of 30 cm height one week before sowing. The uninoculated soil served as control. In each pot, five healthy brinjal hybrid seeds Vijay and Ankur, were sown and replicated thrice. The plants were maintained in the glasshouse with judicious watering. The plant exhibited typical wilt symptoms within 25 days. The pathogen was reisolated from these artificially inoculated plants and maintained on PDA slants for further studies.

Morphological characters of F.solani isolates

From the fifteen days old culture plates, a nine mm disc of the pathogen was cut by using a sterilized cork borer and placed at the centre of each sterile petri dish containing 15ml of previously sterilized and solidified PDA medium. The plates were incubated at room temperature (28±2ºC) for five days. The growth and morphological characters of the isolates *viz.*, colony morphology, mycelial growth rate, were observed under microscope (magnification 45X) after calibration with ocular, and stage micrometer.

Virulence of different isolates of F.solani

Earthen pots with uniform size of 80cm diameter were filled with five kg of garden soil. The soil was sterilized in an autoclave at 1.4 kg cm^{-2} pressure for two hours on two successive days and inoculated by mixing 5g inoculum of each isolate (multiplied on sand maize medium) of the pathogen. Five brinjal seedlings were sown in each pot and replicated three times. The pots were maintained in the greenhouse by regular, uniform and judicious watering and growth were observed continuously for development of disease symptoms. The percent disease incidence of each isolate was recorded after 25 days of inoculation.

Growth characters of F.solani isolates on different solid media

In order to compare the growth of *F.solani* strains on various solid media *viz*., Potato dextrose, Czapekdox and Richard's, the sterilized warm medium at 15 ml were poured in the sterilized petri dish (10 cm) and the medium was allowed to solidify. The pathogen was inoculated at the centre of the plates by placing fifteen days old nine mm culture disc of the pathogen. The plates were incubated at room temperature (28±2ºC) and three replications were maintained. The radial growths of the mycelium were measured seven days after inoculation. The colony and the growth pattern on the culture medium were also recorded.

Growth characters of F.solani isolates on different liquid media

Liquid broth *viz*., Potato dextrose, Czapeksdox and Richard's were prepared. From the prepared medium, 100ml was transferred to 250 ml Erlenmeyer flask and autoclaved at 1.05 kg cm^{-2} for 15 min and cooled. The mycelial mat was filtered through a preweighed Whatman No.1 filter paper, dried in a hot air oven at 100ºC until a constant weight was obtained. The mycelial dry weight was obtained by subtracting the weight of the filter paper.

Utilization of different Carbon and Nitrogen sources of solid media

The Czapekdox medium was substituted with different carbon sources *viz*., galactose, sucrose, dextrose, lactose and nitrogen sources *viz.,* ammonium nitrate, potassium nitrate, urea, sodium nitrate and calcium nitrate was added to the medium. The medium containing without nitrogen and carbon source served as control. The sterilized warm medium was poured in the sterilized petri dish and allowed to solidify and was inoculated with 15 days old nine mm culture disc of the pathogen. The plates were incubated at room temperature (28±2ºC) for 10 days. The diameter of mycelial growth was recorded. Three replications were maintained.

Utilization of different Carbon and Nitrogen sources in liquid broth

The Czapekdox broth was substituted with different carbon *viz*., galactose, sucrose, dextrose, lactose, and different nitrogen sources *viz*., ammonium nitrate, potassium nitrate, urea, sodium nitrate, and calcium nitrate were added to the medium. The broth containing without nitrogen and carbon sources served as control. The sterilized warm broth was inoculated with 15 days old nine mm culture disc of the pathogen. The flasks were incubated at room temperature (28+2°C) for 10 days. The mycelial dry weight was recorded. Three replications were maintained.

Effect of different pH levels on the growth of F.solani under in vitro

One hundred ml of potato dextrose agar broth was prepared and transferred to 250 ml conical flask, and the pH of the broth was adjusted to different pH levels *viz.*, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0 and 8.5 with 0.1 N HCL or 0.1 N NaOH by using digital pH meter (Madox) and sterilized in an autoclave at 1. kg cm^{-2} for 20 min. A nine mm PDA culture disc of actively growing *F.solani* was placed at the center of each conical flask containing the broth under aseptic conditions. The flasks were incubated at room temperature (28+2°C) for 15 days. Three replications were maintained for each pH level. The mycelial dry weight of the pathogen was measured 10 days after incubation.

Statistical analysis

The pot culture and laboratory experiments were conducted by following Completely Randomized Design. Field experiment was laid out with Randomized Block Design. The statistical analysis of the experiment was done by following the methods suggested by Gomez and Gomez (1984). DMRT (Duncan's Multiple Range Tests) was used to compare the effect at 5 per cent level of significance.

RESULTS AND DISCUSSION

Isolation of F.solani f.sp.melongenae

The pathogen responsible for wilt *(F.solani f.sp. melongenae)* of brinjal was isolated from infected roots showing typical symptoms of wilt. The isolation was made from roots as well as from the foliar parts of wilted brinjal plants. Roots and plant parts were collected from infected brinjal plants showing characteristic symptoms of wilt. This work was justified by Verma *et al.* (2002). Many workers have reported the existence of isolated *F.solani*. sp.*melongenae* from different places (Joseph *et al.,* 2008).

Table 1. Virulence of different isolates of *Fusarium solani* on brinjal in pot culture

Isolates	Location	Disease incidence (%) *
MDCFSM 1	Checkkanurani	8.95 (17.4)
TVAFSM 2	Athuvazhi	7.38 (15.76)
MDSFSM 3	Surakundu	6.33 (147.57)
VNPFSM 4	Pudhur	7.05 (15.05)
TRKFSM 5	Kalapatti	6.33 (14.57)
DNFSM 6	Nilakottai	4.5 (12.24)
		0.27

Mean of three observation; Days : 0.006; Isolates x Days : 0.024

Pathogenicity of F.solani f.sp.melongenae isolates

A pot culture experiment was conducted to test the virulence of isolates collected from different places of Tamil Nadu. Six strains of *F.solani* were collected from various locations were multiplied on sand maize medium(sand and ground maize grains mixed in the ratio of 19:1, moistened and autoclaved in saline bottles for two h) and incubated at 28±2°C for 21 days. This sand maize culture was mixed with sterile soil at five per cent level and transferred to earthen pots of 30 cm height one week prior to sowing.

Table 2. Morphological characters of different isolates of *Fusarium solani* on brinjal

Isolates	Location	Colour	Macro conidia		Micro conidia		Days taken to complete growth
			Septation	Size (m)	Septation	Size (m)	
MDCFSM 1	Madurai	Purple white	5	26 3.0	1	11.5 4.1	12
TVAFSM 2	Tirunelveli	Purple white	4	23 4.2	1	8.5 4.04	13
MDSFSM 3	Madurai	Grey	4	21 4.5	1	8.5 3.9	15
VNPFSM 4	Virudhunagar	White	3	19 3.5	1	9.5 2.68	13
TRKFSM 5	Trichy	Purple white	2	17 3.3	1	7.5 3.14	15
DNFSM 6	Dindugal	White	2	16 3.0	1	7.0 2.98	15

Mean of three replications

The uninoculated soil served as control. In each pot, five healthy brinjal hybrid seeds Vijay and Ankur were sown and replicated thrice. The plants were maintained in the glasshouse with judicious watering. Among the six isolated screened, MDCFSMI collected from Checkkanurani in Madurai district recorded 8.95 per cent disease infection under artificial inoculation and was identified as a virulent culture.

Table 3.Growth of *Fusarium solani* on different solid media *in vitro*

Isolates	Mycelial growth (cm*) 15DAI **			Mean
	Potato Dextrose Agar	Czapekdox Agar	Richards Agar	
MDCFSM 1	8.75	8.87	8.65	8.75
TVAFSM 2	8.79	8.43	8.71	8.64
MDSFSM 3	8.80	8.80	8.70	8.76
VNPFSM 4	8.90	8.50	8.60	8.66
TRKFSM 5	7.56	8.54	8.58	7.22
DNFSM 6	7.87	8.52	6.45	7.61
Mean	8.44	8.61	7.78	0.00

Isolates : 0.16; Medium 0.11; Isolates*Medium 0.27; CD; P=0.05 * Mean of three replications; **DAI-Days after inoculation

In contrast, infection in other isolates ranged from 4.5 to 7.38 per cent (Table 1). The leaves of brinjal plants curled downwards. As the disease progressed, the withering started from bottom leaves. The infected roots of brinjal plants cannot be pulled out easily. To confirm the pathogenicity, the pathogen was reisolated and its characters were studied and compared with original culture. The virulent culture MDCFSMI was used in all experiments in the subsequent study. The results indicated that the pathogenic isolates showed variation in their virulence depending upon the continuous availability of host.

Table 4. Growth of *Fusarium solani* isolates on different liquid broth *in vitro*

Isolates	Mycelial dry weight (mg)* 15DAI **			Mean
	Potato Dextrose Agar	Czapeksdox Agar	Richards Agar	
MDCFSM 1	345.1	383.3	157.5	295.3
TVAFSM 2	319.1	292.0	153.3	254.8
MDSFSM 3	298.3	343.3	61.6	234.4
VNPFSM 4	275.0	237.3	88.3	200.2
TRKFSM 5	256.6	383.1	62.0	233.9
DNFSM 6	235.8	241.6	95.0	190.8
Mean	288.3	313.4	102.9	

Isolates : 14.8; Medium 1.05; Isolates*Medium 25.6; CD; P=0.05 * Mean of three replications; **DAI-Days after inoculation

Morphological characters of the F.solani f.sp. melongenae isolates

Morphological characters are essential tools for the identification and classification of the fungus. In the present study, the spore size, septation of conidia and color of the conidia were used for identifying the fungus. Checkkanurani isolates took only three days for the initiation of the mycelial growth and the entire plate was covered (9 mm) within 12 days. In the case of other isolates, the time taken for the mycelial initiation was noticed by 12 to 15 days (Table 2). The color of the mycelia was purplish-white in three isolate (Madurai, Tirunelveli, Trichy), white in two isolates (Virudhunagar, Dindugal) and grey in one isolate (Madurai). The size of the microconidia was maximum of 11.5°m in Checkkanurani strains and a minimum of 7°m in Dindugal isolate. Similar observations on the variations of *F.solani* f. sp.m*elongenae* in the mycelia color, nature of mycelial growth and conidial size were reported by Jeyalakshmi (1997) and Gupta and Misra (2003).

Table 5. Effect of different carbon sources on the growth of *Fusarium solani* in solid media *in vitro*

Isolates	Mycelial growth (cm)* 15DAI **					
	Galactose	Sucrose	Dextrose	Lactose	Control	Mean
MDCFSM 1	8.60	8.93	5.16	8.80	5.50	7.66
TVAFSM 2	8.50	8.50	7.66	8.23	4.16	7.65
MDSFSM 3	8.76	8.90	7.08	4.93	4.33	6.99
VNPFSM 4	8.60	7.30	8.63	7.30	4.20	7.42
TRKFSM 5	8.00	8.66	5.60	8.86	4.10	7.33
DNFSM 6	8.30	7.16	7.36	8.63	4.16	7.42
Mean	8.46	8.24	6.90	7.79	4.41	

Isolates : 14.8; Medium 1.05; Isolates*Medium 25.6; CD; P=0.05 * Mean of three replications; **DAI-Days after inoculation

Growth of Fusarium solani f.sp.melongenae on different solid and liquid media

The isolates exhibited variations is growth in different solid media when tested. Growth was the highest in the Czapekdox medium (8.61 cm) followed by Potato dextrose agar (8.44 cm), while, the lowest growth was recorded in Richards agar medium (7.78 cm) (Table 3). Among the three liquid media tested, the Czapekdox liquid broth recorded maximum dry weight (288.3 mg), while Richards broth showed the least dry weight (102.9 mg) (Table 4). Similarly, Czapekdox ager was the best for the radial growth of *F.solani* as this fungus gave a maximum growth of 85mm (Farooq *et al.*, 2005). Dutta and Chatterjee (2004) reported that in liquid media, the mycelial dry weight of both the fungus was maximum in Czapekdox broth as basal medium.

Table 6. Effect of different carbon sources on growth of *Fusarium solani* in liquid broth *in vitro*

Isolates	Mycelial growth (mg)* 15DAI **					
	Galactose	Sucrose	Dextrose	Lactose	Control	Mean
MDCFSM 1	431.3	359.0	142.6	382.3	80.0	307.9
TVAFSM 2	408.3	355.0	12.6	387.3	70.6	241.8
MDSFSM 3	326.0	453.3	78.3	306.6	49.0	266.0
VNPFSM 4	242.6	374.0	106.6	316.0	88.0	232.7
TRKFSM 5	279.3	358.0	179.6	218.3	88.0	248.1
DNFSM 6	257.3	387.0	152.0	279.0	65.0	256.8
Mean	324.1	381.0	127.0	314.9	73.4	

Isolates : 30.2; Medium 30.2; Isolates*Medium 73.95.6; CD; P=0.05 * Mean of three replications; **DAI-Days after inoculation

Growth of Fusarium solani f.sp.melongenae on different carbon sources in liquid broth and solid media

The aggressive isolate MDCFSMI recorded the maximum mycelial growth in all the carbon sources indicating its wide adaptability. The Czapeksdox medium and broth were substituted with different carbon sources *viz*., galactose, sucrose, dextrose, lactose were added to the medium. The medium containing without carbon source served as control. The sterilized warm broth and medium were inoculated with 15 days old nine mm culture disc of the pathogen.

Table 7. Effect of different Nitrogen sources on mycelial growth of *Fusarium solani* in solid media

Isolates	Mycelial growth (mg)* 15DAI **						
	Potassium nitrate	Sodium nitrate	Calcium nitrate	Ammonium nitrate	Urea	Control	Mean
MDCFSM 1	8.91	8.76	8.92	8.87	8.95	4.66	8.17
TVAFSM 2	8.85	8.75	8.85	8.76	8.95	4.56	8.12
MDSFSM 3	8.86	8.65	8.87	8.86	8.86	4.01	8.02
VNPFSM 4	8.76	8.56	8.76	8.77	8.87	4.37	8.01
TRKFSM 5	8.66	8.57	8.75	8.85	8.86	4.58	8.04
DNFSM 6	8.88	8.71	8.65	8.68	8.87	4.18	8.00
Mean	8.82	8.67	8.80	8.80	8.89	4.39	

Isolates : 0.08; Medium 0.08; Isolates*Medium 0.20; CD; P=0.05 * Mean of three replications; **DAI-Days after inoculation

The flasks and plates were incubated at room temperature (28+2°C) for 10 days. The mycelial dry weight and mycelial growth in plates were recorded. Three replications were maintained. Among the different carbon sources, galactose recorded maximum mycelial growth (8.68 cm) followed by sucrose (8.24 cm). Dextrose recorded the minimum mean mycelia growth (6.90 cm) (Table 5). Among the four-carbon sources in liquid broth, the maximum mycelial growth was observed in sucrose (381.0 mg) followed by galactose (324.1 mg) (Table 6). Similar results were obtained by Farooq *et al.* (2005) who has reported that glucose and sucrose were found to be the best carbon sources for *Fusarium oxysporum.* Maximum growth was recorded in the media with the highest C/N ratio and increasing the C/N ratio of the medium resulted in the reduced macro conidial formation and increased chlamydospore production. The C/N ratio also influenced macro conidial morphology. It is suggested that carbon concentration is an important factor than the C/N ratio of medium (Oritsejafor, 1986).

Growth of F. solani f.sp.melongenae on different nitrogen sources in solid media and liquid broth in vitro

The Czapekdox medium and broth were substituted with different nitrogen sources *viz.,* ammonium nitrate, potassium nitrate, urea, sodium nitrate, and calcium nitrate. The broth containing without nitrogen sources served as control. The sterilized warm

Table 8. Effect of different Nitrogen sources on mycelial dry weight of *Fusarium solani* in liquid broth

Isolates	Mycelial dry weight in (mg)* 15DAI **						
	Potassium nitrate	Sodium nitrate	Calcium nitrate	Ammonium nitrate	Urea	Control	Mean
MDCFSM 1	326.0	355.0	454.0	186.2	386.8	186.4	315.2
TVAFSM 2	217.8	276.6	325.6	237.4	265.5	192.8	252.3
MDSFSM 3	226.8	178.4	329.2	126.8	287.5	127.3	212.4
VNPFSM 4	315.6	275.4	356.5	286.7	365.5	166.8	294.3
TRKFSM 5	191.2	335.7	276.4	200.8	286.3	157.0	241.5
DNFSM 6	155.6	175.8	285.9	266.4	282.2	137.0	217.5
Mean	238.0	265.5	338.4	217.6	312.3	161.5	

Isolates : 110.0; Medium 110.0; Isolates*Medium 270.0; CD; P=0.05* Mean of three replications; **DAI-Days after inoculation

broth and medium were inoculated with 15 days old nine mm culture disc of the pathogen. The flasks and plates were incubated at room temperature (28+2ºC) for 10 days. The mycelial dry weight and mycelial growth in plates were recorded. Three replications were maintained. In respect to nitrogen sources, the result revealed that urea was the best nitrogen source recorded. The maximum mycelial growth (8.89 cm) followed by potassium nitrate (8.82 cm). The sodium nitrate recorded the minimum mycelial growth (8.67 cm) (Table 7). Among the liquid broth, the maximum mycelial dry weight was observed in urea (312.0 mg) followed by potassium nitrate (235.0 mg). The minimum mycelial dry weight was observed in ammonium nitrate (217.0 mg) (Table 8). The fungus may utilize a certain complex forms of nitrogen combined with simpler form, which may be readily metabolized (Bais *et al*., 1970).

Table 9. Effect of different pH levels on the growth of *Fusarium solani* isolates *in vitro*

Isolates	Mycelial dry weight in (mg)* 15DAI **										
	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	Mean
MDCFSM 1	291.0	395.0	425.0	398.0	367.0	377.0	485.0	487.4	411.0	75.0	538.2
TVAFSM 2	257.0	312.0	413.0	358.0	364.0	374.0	484.0	486.5	346.0	0	502.6
MDSFSM 3	201.0	234.0	415.0	353.0	354.0	373.0	381.0	484.3	365.0	10.5	461.6
VNPFSM 4	155.0	262.0	365.0	269.0	356.0	372.0	483.0	378.3	312.0	0	456.8
TRKFSM 5	173.0	271.0	318.0	50.30	259.0	369.0	375.0	485.5	342.0	30.5	454.7
DNFSM 6	223.0	280.0	338.0	43.70	252.0	260.0	478.0	382.6	394.0	210.8	443.9
Mean	216.0	292.3	379.0	385.3	392.3	395.0	425.0	456.0	361.6	200.5	

Isolates : 110.0; Medium 110.0; Isolates*Medium 270.0; CD; P=0.05 * Mean of three replications; **DAI-Days after inoculation

Effect of different pH levels on the growth of Fusarium solani f.sp.melongenae in vitro

In the present study, maximum mycelial growth was observed at pH 7.5 (456.0 mg) followed by pH 7.0 (425.0 mg). Less growth was observed at pH 8.5 (Table 9). Farooq *et at.* (2005) reported that the growth of *Fusarium oxysporum* was maximum (80 mm) at pH 7.0. Chakraborty *et al.*(2009) reported that in potato dextrose agar, *Fusarium solani* f.sp. *melongenae* grew over a pH range of 7.4. Variation in growth and sporulation of isolates at a particular pH may be due to the fact that a particular isolate grows better at a specific pH. The other possible reason may be that isolates collected from a particular location may have adjusted themselves according to condition prevailing in that area and adopted a particular pH for growth and sporulation (Mehta *et al*., 2005).

CONCLUSION

In the present study, *Fusrium solani* MDCFSM 1 isolate collected from Checkkanurani was observed the most virulent. All the isolates produced micro and macroconidia but the isolates varied in size (length and width) of the conidia, septation in macroconidia, colony colour and growth rate. Czapekdox agar and potato dextrose agar media supported the maximum growth in both solid medium and liquid broth. Among different carbon sources tested in solid and liquid broth, urea and potassium nitrate were identified as the best nitrogen source for mycelial growth. Although *Fusarium solani* grew well at wide range of pH, the highest mycelial growth was observed at pH 7.0 to 7.5.

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