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Effect of Different Cultural Media on Growth of *Sclerotium rolfsii* sacc. causing Root Rot of Chilli

T.S. Archana*, Pankaj B. Deore, S.D. Jagtap and B.S. Patil

Department Plant Pathology, College of Agriculture, Dhule- 424 004
Mahatma Phule Krishi Vidyapeeth, Rahuri (Maharashtra, India)

**Corresponding author*

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A B S T R A C T

Chilli is grown in many states in India as a valuable trade crop. Chilli accounts for 20-30% of total Indian spices exports valuing approx Rs. 400-500 cores. Nine cultural media Potato dextrose agar, Host extract agar (Chilli), Oat meal agar, Carrot agar, Plane agar, Richards agar, Czapeks agar, Elliots agar, Saboroud's agar were analyzed for in vitro mycelial growth of *Sclerotium rolfsii.* The cultural characteristics indicated that the excellent growth and sclerotia formation were observed on different semi-synthetic media *viz*., Potato dextrose agar and Host extract agar medium (Chilli) followed by Oat meal agar, Saboround's agar and Richard's agar.

Introduction

Sclerotium rolfsii is widely distributed in tropics, subtropics and also in warmer parts of temperate zone of the world. In India, it is wide spread in almost all the states and causing economic losses in many crops. The numerous reports from tropical and subtropical areas of the world, coupled with the large number of hosts attacked by it indicate that, economic losses are substantial every year due to infection of *Sclerotium rolfsii* (Aycock, 1966). *Sclerotium rolfsii* is a soil inhabitant, non-target, polyphagous and an ubiquitous facultative parasite. It has wide host range infecting particularly solanaceous crops. It is documented that, fungus infects more than 500 plant species (Rupe, 1999).

Among the soil borne diseases, root rot caused by *Sclerotium rolfsii* is gaining a serious status. This disease also referred as *Sclerotium* blight, *Sclerotium* wilt, Southern blight, Southern stem rot and white mold. This fungus is distributed throughout the world and is particularly prevalent in warmer climate and significant yield losses can be seen in monoculture or short rotation with other crops which are susceptible to this pathogen (Aken and Dashiell, 1991).

Materials and Methods

Isolation of *Sclerotium rolfsii*

Isolation of *Sclerotium rolfsii* was carried out from diseases chilli plant collected from Khandesh redion.

Cultural studies

The cultural characters of the pathogen were studied on the following solid media *viz*.,

1. Potato dextrose agar

Potato = 200 g
Dextrose =20 g
Agar = 20 g
Distilled water =1000 ml

2. Host extract agar (chilli)

Healthy chilli leaves = 200 g
Dextrose = 20 g
Agar-agar = 20 g
Distilled water =1000 ml

3. Oat meal agar

Oat meal = 30 g
Agar-agar = 20 g
Distilled water =1000 ml

4. Carrot agar

Carrot = 200 g
Dextrose = 20 g
Agar-agar = 20 g
Distilled water = 1000 ml

5. Plane agar

Dextose = 20 g
Agar-agar = 20 g
Distilled water = 1000 ml

Synthetic media

Richard's agar

Potassium nitrate (KNO_3) = 10 g Potassium monobasic phosphate (KH_2PO_4)= 5 g
Magnesium sulphate (Mg $SO_4.7H_2O$) = 2.5 g,
Ferric chloride ($Fecl_3.6H_2O$) = 0.02 g
Sucrose ($C_{12}H_{22}O_{11}$) = 50 g
Agar-agar = 15 g
Distilled water = 1000 ml.

Czapek's Dox agar

Sodium nitrate ($NaNO_3$) = 3 g
Potassium dihydrogen phosphate (K2HPO4) =1 g
Magnesium sulphate ($MgSO_4.7H_2O$) = 0.5 g
Ferrous sulphate ($FeSO_4.7H_2O$)=0.19 g,
Sucrose ($C_{12}H_{22}O_{11}$) =30 g
Agar-agar = 15 g
Distilled water = 1000 ml

Elliot's Agar (EA)

Sodium carbonate (Na_2CO_3) =1.05g
Magnesium sulphate ($MgSO_4.7H_2O$) = 0.60 g
Asparagine = 3.00 g
Dextrose ($C_6H_{12}O_6$) =3.00g
Potassium dihydrogen orthophosphate = 1.36 g (KH_2PO_4)
Agar-agar = 20.00 g
Distilled water = 1000 ml

Sabouround's agar

Dextrose = 200 g
Peptone = 20 g
Agar-agar = 20 g
Distilled water = 1000 ml

Results and Discussion

The results obtained from the present investigation are summarized below:

Table.1 Effect of different cultural media on colony diameter, growth characters and *Sclerotia* formation of *S. rolfsii* Sacc. causing root rot of chilli

Tr. No.	Media	Average colony diameter (cm)* 10 days after Inoculation	Growth characters	Growth
1	Potato dextrose agar	9.0	Mycelium milky white, flat thick mycellial growth with good sclerotia formation	++++
2	Host extract agar(Chilli)	9.0	Mycelium milky white, flat thick growth and dark sclerotia were formed	++++
3	Oat meal agar	8.0	Mycelium is milky white, fluffy and sclerotia formed	+++
4	Carrot agar	7.1	White thick mycelium. sclerotia were formed.	+++
5	Plane agar	4.2	White pale and thin mycelium.no sclerotia formation	-
6	Richards agar	7.5	Milky white mycelim with uniform margin .dark,small sclerotia were formed.	+++
7	Czapeks agar	6.1	White mycelium with flat round growth. sclerotia were formed	++
8	Elliots agar	2.2	White mycelium with uneven topography. Sclerotia were lately formed	+
9	Saboround's agar	8.2	White thick fluffy mycelium. Sclerotia formed	+++
	S.E. ±	0.09		
	C.D. at 5%	0.26		

+ Very poor ++ Poor +++ Moderate ++++ Good, * Mean of three replication

Plate.1 Effect of different cultural media on growth of *Sclerotium rolfsii*

T_1 Potato dextrose agar
T_2 Host extract agar
T_3 Oat meal agar
T_4 Carrot agar
T_5 Plane agar
T_6 Richard's agar
T_7 Czapek's agar
T_8 Elliot's agar
T_9 Saboround's agar

Effect of different cultural media on growth of *S. rolfsii.* Sacc

Cultural characters of the test fungus were studied on nine different synthetic and semi-synthetic media. After seven days of inoculation, the treatment differences in respect of colony diameter, growth characteristics and sclerotia formation were noticed, which are presented in Table 1 and Plate-1.

Growth

The result presented in Table 1 revealed that the maximum growth was recorded on Potato dextrose and host extract agar medium with milky white, flat thick mycellial growth with colony diameter of 9.0 cm followed by Saboroud's agar medium with colony diameter 8.2 cm which produced white thick fluffy mycelium.

The next best treatments were Oat meal 8.0 cm with milky white fluffy colony, Richard's agar media has of 7.5 cm with aerial milky white mycelium with uniform margin followed by, Carrot agar with 7.1 cm with white thick mycelium, Czapek's Dox agar 6.1 cm with circular flat white mycelium, Plane agar medium 4.2 cm colony diameter with pale thin growth of mycelium and Elliot's agar 2.2 cm produced white mycelium with uneven topography.

In conclusion, cultural characters of fungus were studied on nine solid media. The excellent growth and sclerotia formation was observed on Potato dextrose agar and Host extract agar medium (Chilli) followed by Saboroud's agar, Oat meal and Richards' agar. The colony of *Sclerotium rolfsii* was circular, white with thick growth on the upper surface of PDA.

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