Annals of Plant and Soil Research 28(1): 12- 20 (2026)
https://doi.org/10.47815/apsr.2026.10508

Characterization of *Sclerotinia Sclerotiorum* (LIB.) De bary causing stem rot of yellow sarson (*brassica rapa* l.) in Bhagalpur division, Bihar

RUMMY PRIYA AND H. K. CHOURASIA*

Applied Microbiology and Plant Pathology Laboratory, University Department of Botany

Received: March, 2026; Revised accepted: May, 2026

ABSTRACT

Yellow mustard (Brassica rapa, also referred to as B. campestris var. yellow saron) is an important rabi oilseed crop of India. It is grown on a large scale in Bhagalpur division of Bihar and pose a serious threat to stem rot disease caused by Sclerotinia sclerotiorum. This ubiquitous necrotrophic soil-borne plant pathogen with a wide host range is difficult to control and cause yield losses upto 50% or more. In this study, pathogen was isolated on PDA medium, purified by using hyphal tip method from infected mustard plant samples collected randomly from farmer's fields. Microscopic observation showed hyphae were hyaline, branched and septate, and asci arranged on periphery of ascocarp. Ascus was hyaline, barrel shaped and produced in tightly compact mass with filiform paraphyses at the upper surface of apothecium. The morphological and cultural characteristics of S. sclerotiorum studied on different culture media, revealed maximum mycelial growth at 96 hrs after inoculation on PDA (84.75 mm), followed by mustard leaf agar (82.50 mm), mustard seed agar (78.25 mm), while minimum growth was recorded in Asthana & Hawker's agar (41.10 mm) followed by Richard's agar (43.25 mm) and Czapek's dox agar (45.75 mm). The data on the time taken for first sclerotia formation, average size, number and weight of sclerotia per Petri plate, and shape and colour of sclerotia on different culture media were also recorded. Of eleven culture media evaluated, PDA medium was found most suitable for mycelial growth and sclerotia formation of S. sclerotiorum. In physiological studies, the highest mycelial growth on PDA was recorded on 5 days after inoculation at 20°C (85.62 mm), followed by 25°C (72.35 mm) and 15°C (71.25 mm) and least growth occurred at 35°C(2.71mm). Sclerotial production was also highest at 20°C and lowest at 15°C. The pH 5.0 was found ideal and favoured maximum dry weight mycelium in potato dextrose broth, followed by pH 4.5 and 5.5. At pH above 5.0, the dry mycelial weight was found to be declined.

Key words: Characterization, *sclerotinia sclerotiorum,* yellow sarson, Bhagalpur division
T.M. Bhagalpur University, Bhagalpur- 812 007, Bihar, India

INTRODUCTION

Yellow Sarson or Rai, (*Brassica rapa* L.) is one of the major rabi (winter) oilseed crops of India. It is extensively grown traditionally as a pure crop as well as intercrop (mixed crop) in marginal and sub-marginal soils in the eastern, northern and north-western states on an area of 6.69 million hectare with a production of 10.11 million tonnes and productivity 1511kg/ hectare (Anonymous, 2015). The cool and moist weather with heavy dew prevailed in the winter months (November to February) are the major factors for luxuriant growth and productivity of mustard in these states. The sight of vibrant yellow mustard fields is a defining feature of the Bihari landscape from December to February. It is not just a crop, it is a part of the state's identity, crucial for its edible oil economy and deeply embedded in its cuisine, particularly in the form of Sarson ka Saag. Yellow mustard is cultivated across the Bihar state, but its production is concentrated in four specific agroclimatic zones - Bhagalpur Division, Patna Division, Tirhut Division and Saran Division. In Bhagalpur Division, districts like Bhagalpur and Banka are top producers of yellow mustard.

Despite considerable increase in productivity and production, a wide gap exists between yield potential and yield realized at farmer's field, which is largely due to biotic (fungi, bacteria, viruses and phytoplasma) and abiotic stresses (high soil moisture, cool, moist conditions and temperatures between 11-24°c). *Sclerotinia* stem rot of yellow mustard is a severe fungal disease caused by the pathogen *Sclerotinia sclerotiorum.* Once established in a

*Corresponding author Email: hkchourasia96@gmail.com

field, this ubiquitous necrotrophic soil-borne plant pathogen with a wide host range (tomato, Potato, brinjal, peppers, carrots, cabbage, cauliflower, lettuce, french bean etc.) is difficult to control and can cause significant yield losses, occasionally upto 50% or more (Hansda *et al.*,2014; Rakesh *et al;* 2016; Husain and Choudhary,2018). The disease has been reported from different parts of India and a few reports is available in Bihar (Choudhary *et al.,* 2022; Rai *et al.,2024*).Keeping in view the significance of the crop and the disease, the present study has been undertaken to study the morphological and cultural characteristics of *S. sclerotiorum* on synthetic, semi-synthetic and crop based modified culture media viz., Potato dextrose agar, Czapek's dox agar, Richard's agar, Asthana & Hawker's agar, Cabbage leaf agar, French bean seed agar, Mustard leaf agar, Mustard stem agar, Mustard seed agar, Mustard stem extract 10% + sucrose 2% agar, and Mustard seed extract 10% + sucrose 2% agar and the physiological studies includes effect of temperature and pH on growth and sclerotial production potential of the pathogen.

MATERIALS AND METHODS

Collection of diseased samples, isolation and identification of pathogen

Surveys of yellow mustard crops growing in different agricultural fields of Bhagalpur, Banka and Munger districts were conducted during November 2024 to December 2025 to record the incidence of *Sclerotinia* rot (syn. white rot, watery soft rot, cottony rot, white blight) disease. Symptoms and severity of the disease were recorded. The infected stem and leaves were collected, surface sterilized with 0.1% sodium hypochlorite solution for 1 minute and washed thoroughly with sterilized distilled water. The sterilized samples were air dried, placed in Petri plates containing PDA (Potato Dextrose Agar) medium and incubated in a BOD (Biological Oxygen Demand) incubator at 25 ± 2°C to promote pathogen growth. The fungal colonies started to grow after two days were white, floccose, puffy, reversed dull yellow and sclerotia began to develop as fluffy white (non-melanized) compact hyphae after 5 days and turned black (melanized) after 7 days of growth. The isolated pathogen was identified as *Sclerotinia sclerotiorum* on the basis of their cultural characteristics, growth pattern, colour and septation of mycelia, shape and size of apothecia and ascospores. The mature sclerotia were harvested using a sterile forceps and stored at -20°C for further study. The pure culture of *S. sclerotiorum* was maintained in refrigerator at 4°c and renewed after every fifteen days.

Pathogenicity test of *S. sclerotiorum* isolates

The pathogenicity of the isolated fungus was conducted by healthy plant inoculation, seed inoculation, soil inoculation and seed + soil inoculation techniques, soil used in the present study was sterilized at 1.045 kg/pressure for one and half hour. Pots were surface sterilized by dipping them in 10% formaldehyde solution for 5 minutes.

Healthy plant inoculation method

For this method, 40 days old yellow mustard plants were grown in 30 cm diameter pots filled with autoclaved soil under glasshouse conditions. Mycelial strip from four days old culture prepared on PDA in Petri plate was used for inoculation. Small incision (0.5 cm length and 0.5-1 mm depth) was given on the third internode of healthy plant and the mycelial strip was put on the injured tissue. Mycelial strip was then wrapped with moist cotton swab and covered with polythene bag to maintain humidity. Such inoculation was done after sunset in the month of january. Polythene bag was removed after four days of inoculation and symptom was examined for disease development throughout the experiment. The uninoculated healthy plant was served as a control.

Seed inoculation method

In this technique, yellow mustard seeds were surface sterilized with 1% sodium hypochlorite solution and then smothered with 7 days old culture of *S. sclerotiorum* grown on PDA. The inoculated seeds were sown in plastic pots containing sterilized soil. Surface

sterilized seeds were sown in untreated pot served as a control.

Soil inoculation

For soil inoculation, sterilized pots were filled with sterilized soil and pots were inoculated with 10 ml spore suspension having 3 x 10^6 spores/ ml as spores load of *S. sclerotiorum.* Surface sterilized yellow mustard seeds were sown in inoculated soil and treated pots were kept in polyhouse. Surface sterilized seeds sown in untreated pots served as a control.

Seed + soil inoculation

In this method, first 10 ml spore suspension of known inoculum of pathogen (3 x 10^6 spores/ml) was applied in the sterilized soil and then inoculated seeds (smothered with 7 days old culture of the pathogen grown on PDA) were sown in pots. Surface sterilized uninoculated seeds were sown in untreated (without inoculum) pot served as a control.
Each treatment of the four inoculation techniques conducted in five replications were maintained using completely randomized design under polyhouse condition.

Assessment of different culture media for growth and sclerotial formation of *S. sclerotiorum*

In this study, the eleven different semi-synthetic, synthetic and crop based modified solid culture media were evaluated for obtaining maximum mycelial growth and sclerotia formation of *S. sclerotiorum*. The culture media viz., Potato dextrose agar (PDA), Mustard leaf agar (MLA), Mustard seed agar (MSeA), Mustard seed extract10% + sucrose 2% agar (MSeESA), Mustard stem extract 10%+ sucrose 2% agar (MStESA), Mustard stem agar (MStA), Cabbage leaf agar (CLA), French bean seed agar (FBSA), Czapek's dox agar (CDA), Richard's agar (RA) and Asthana & Hawker's agar (AHA) were used to compare the growth rate of *S. sclerotiorum*. The culture media were prepared by the standardized method and autoclaved at 121**°**c, 15 psi pressure for 20 minutes. The pH of each medium was adjusted at pH 5.0 prior to autoclaving. Uniform quantities (15ml) of each medium were poured in 90 mm sterilized Petri plates. Each Petri plate was inoculated separately with mycelial culture bits (5 mm) cut with the help of cork borer from 5 days young vigorously growing culture. Mycelial bits were kept in inverted position on the middle of each poured medium under aseptic conditions and incubated at 25 ± 2∘C temperature. The observations were recorded at every 24hr interval. The cultural and morphological characteristics including colony colour, type of growth and radial colony growth of mycelium after 24, 48, 72 and 96 hr of incubation were recorded. Data on the time taken for first sclerotia formation, number and weight of sclerotia formed per Petri plate, shape, size and colour of sclerotia were recorded separately at 10-12 days after inoculation.

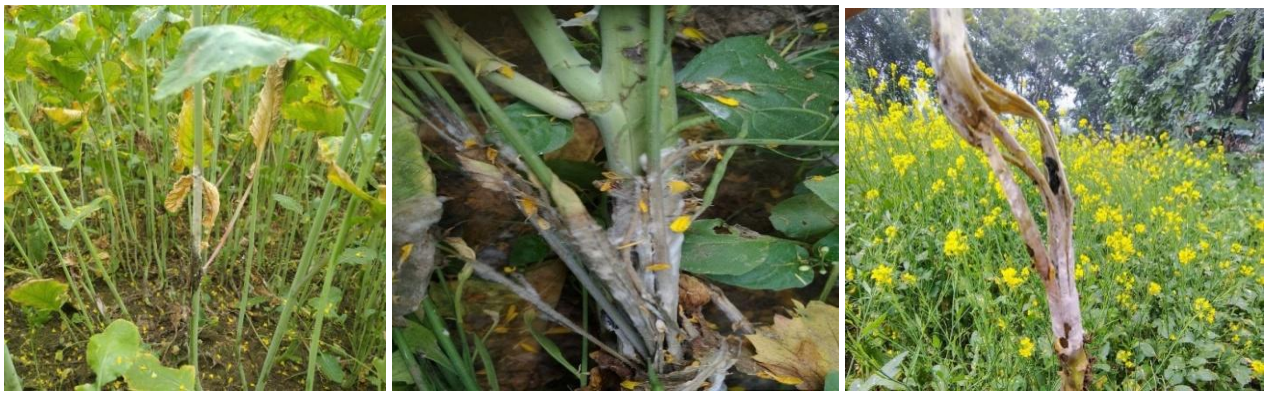
Effect of temperature and pH on growth and sclerotial production potential of *S. sclerotiorum*

The effect of temperature on mycelial growth and sclerotia formation was examined by inoculating mycelial disc (5 mm diameter) of 4- 5 days old culture of *S. sclerotiorum* and incubating them at various temperatures (10°c, 15°c, 20°c, 25°c, 30°c and 35°c) for five days. In order to assess the effect of pH on mycelial growth, 30 ml of Potato dextrose broath (PDB) was added to 100 ml flasks. The pH levels of the medium were adjusted to pH values 4.5, 5.0, 5.5, 6.0, 7.0 and 7.5 using N/10 HCl or N/10 NaOH solutions. The flasks were then inoculated with mycelial discs of *S. sclerotiorum* in three replications and incubated at optimum temperature 25 ± 2∘C for 14 days. Data were collected on the dry weight of the mycelium as well as the average number of sclerotia formed per flask.

RESULTS AND DISCUSSION

Disease symptom

Sclerotinia stem rot in yellow mustard starts as elongated, water-soaked lesions on stem especially at base or at internodes and later white mycelial growth covers these lesions and affected plants look whitish from distance. The pathogen *S. sclerotiorum* causes more or



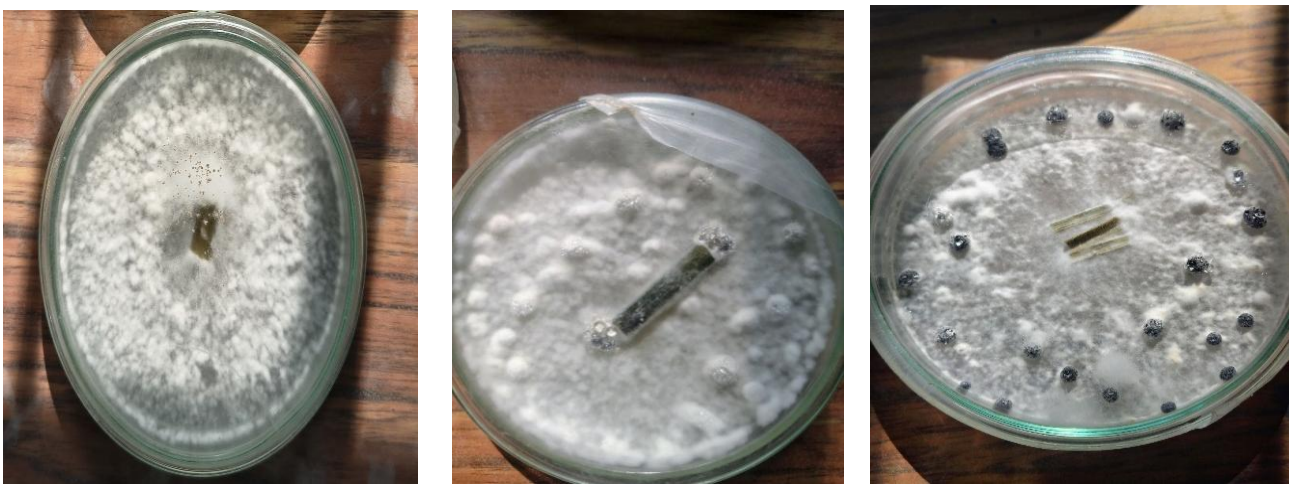
A B C

Fig 1: A: Infected yellow mustard plant showing white cottony mycelium on stem, B: Severe infection on the stem, C: Formation of sclerotia inside the infected pith of stem

less similar symptoms on leaves, stem and siliquae as fluffy white mycelia and sclerotia are produced after mycelial growth. Under severe infection, defoliation, shredding of stem, wilting and drying of plants occurs. Infected plants usually ripe earlier and stand out among green plants (Meena *et al.,* 2014).

Cultural, morphological characters and identification of *S. sclerotiorum*

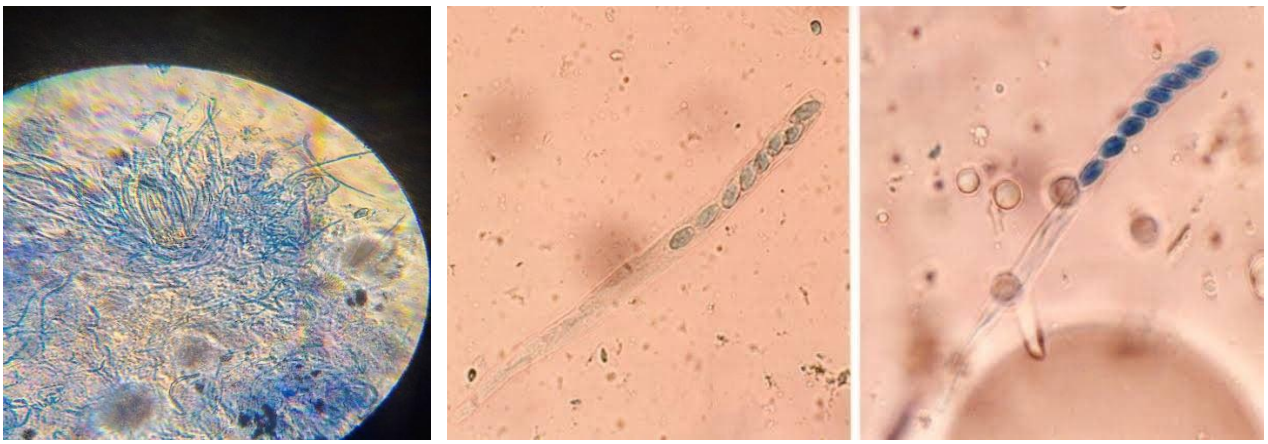
Isolations of pathogen from infected diseased portions of yellow mustard plants were made on PDA medium and isolated fungal culture was purified by using fungal tip method. Identification of *S. sclerotiorum* was done on the basis of cultural and morphological characteristics. On PDA, uniformly one type growth of fungal colony started without zonation with whitish to gray growth in colour and covered the entire Petri plate within 84 hours. After five days of fungal growth, fungal mycelium aggregates to form small mycelial tuft which were developed at the periphery of the Petri plates. Later, mycelial tufts covered the entire Petri plate. Silvery shiny water droplets were appeared frequently around the mycelial tufts in culture plates. Later on, hard black coloured sclerotia were developed from converted mycelial tufts and single sclerotium was fixed and deeply, surrounded by white mycelial net. Spherical to irregular shaped sclerotia were formed and measured 2.7-8.8 mm (length) x 2.3-5.7 mm (width) in size (Fig. 2).



A B C

Fig 2: **A**: Pure culture of *Sclerotinia sclerotiorum* on PDA in Petri plate showing uniform growth of white cottony mycelium, **B**: Initiation of sclerotia formation due to aggregation of mycelial tufts, **C**: Mycelial tufts converted into black sclerotia with silvery shiny water droplets in the periphery of Petri plate

Under microscopic observation, the hyphae were hyaline and branched. Asci are arranged on periphery of ascocarp. They are hyaline, barrel shaped and produced in tightly compact mass with filiform paraphyses at the upper surface of apothecium. Ascospores are elliptical to oval, single celled, hyaline and each ascus posses eight number of ascospores. (Fig3). Sclerotia formed on the host surface were typically loaf-shaped or globose, whereas those produced in the pith of the stem were elongated. The sclerotia produced in culture closely resembled those formed on the host in all morphological aspects. *In vitro* studies revealed that sclerotia were distributed at the edges of the Petri plates on PDA.



A B C

Fig. 3: A. 12 days old culture of *S. sclerotiorum* showing cup- shaped apothecium with ascus and paraphyses, B & C. Microphotograph of ascus with eight ascospores

The results are in conformity to the findings of several earlier workers. Goswami *et al.* (2012) were studied *sclerotinia* rot of mustard and isolated pathogen which on PDA produced white to light brown colony with uniform mycelial growth, black sclerotia were formed at the periphery of the plates. Hansda *et al.* (2014) isolated *S. sclerotiorum* from brinjal and observed white mycelium with hyaline, branched and septate hyphae. Husain and Choudhary (2018) isolated and identified *S. sclerotiorum* from oilseed Brassica on the basis of cultural and morphological characteristics. Similar results also reported by Islam *et al.*, (2020); Sharma *et al.,* (2023) and Shaheer *et al.* (2025).

Table 1: Cultural and morphological characters of *Sclerotinia sclerotiorum*

S.No.	Fungal characters	Colour	Shape
1	Colony	Whitish to gray	Uniformly fluffy regular
2	Hyphae	Hyaline	Branched, cottony and septate
3	Sclerotia	Dark brown to black	Round to irregular
4	Apothecia	Brown	Disc-shaped
5	Ascus	Hyaline	Barrel-shaped
6	Ascospore	Hyaline	Elliptical to oval, single-celled

Pathogenicity of isolated pathogen

Pathogenicity of *S. sclerotiorum* on seedlings of yellow sarson was conducted using four different methods of inoculation, in which seed + soil inoculation method showed maximum percent disease incidence with 75.55 percent followed by soil inoculation (66.50 per cent) and healthy plant inoculation (61.00 per cent) method. Lowest per cent disease incidence recorded in seed inoculation method with 53.45 per cent. The test fungus produced typical symptoms of disease but its intensity varies with methods of inoculation. In seed + soil inoculation method, pathogen showed small water-soaked lesion on the stem at the ground level, which enlarge rapidly in size and girdled the entire base of young stem at the collar region. At later stage, whitish mycelial growth and formation of black sclerotia were

observed on infected portions of stems. These studies were supported by Iqbal *et al.* (2003), Hansda *et al.* (2014), Sharma *et al.* (2015, 2016) and Prajapati *et al.* (2020) They proved pathogenicity of *S. sclerotiorum* on several solanaceous and oilseed crops including brinjal, chilli, tomato, cucumber, lettuce and Indian mustard.

Table 2: Pathogenicity test of isolated pathogen on yellow mustard plant

Inoculation method	Disease incidence*
Healthy plant inoculation	61.00
Seed inoculation	53.45
Soil inoculation	66.50
Seed + Soil inoculation	75.55
Uninoculated(control)	0.00
SEM ±	1.72
CD (P =0.05)	4.88

**Average of five replicates*

Assessment of various culture media for growth and sclerotia formation of *S. sclerotiorum*

Results of the experiment conducted during 2025-26 for the study of differential support of eleven different culture media on growth of *S. sclerotiorum* are presented in Table-3. Significant difference in the fungal growth was observed in the tested media at 24, 48, 72 and 96 hrs after inoculation. The data revealed that the maximum mycelial growth was recorded at 96 hrs after inoculation on potato dextrose agar (84.75mm) followed by mustard Leaf agar (82.50 mm), mustard seed agar (78.25mm), mustard seed extract 10%+ sucrose 2% agar (72.15 mm) and mustard stem extract 10% + sucrose 2% agar (68.17mm), while minimum growth was recorded in Asthana & Hawker's agar (41.10 mm) followed by Richard's agar (43.25mm) Czapek's dox agar (45.75 mm), French bean seed agar (49.65mm), cabbage leaf agar (52.27 mm) and mustard stem agar (60.55 mm), respectively. The data on the time taken for first sclerotia formation, average size of sclerotia, average number and weight of sclerotia per Petri plate, and shape and colour of sclerotia are presented in Table 4. Sclerotia formation started after 120 hrs incubation in MStESA, MStA, CLA, FBSA, CDA, RA and AHA media followed by 96 hrs in PDA, MLA, MSeA and MSeESA media. The maximum number of sclerotia per plate was recorded in PDA (14.25/plate) and MLA (10.55/Plate) while the minimum number of sclerotia was found in AHA (3.33/plate), RA (4.20/plate) and CDA (4.44/plate), respectively. The maximum and minimum size of sclerotia was recorded in PDA (7.50mm) and AHA (3.15mm), respectively. The highest weight of sclerotia per plate was recorded in PDA (710.00mg) while lowest weight of sclerotia per plate was found in AHA medium (355.55 mg). Primarily spherical and later irregular-shaped sclerotia was found on PDA, oval-shaped on MLA, MSeA, MSeESA, MStESA, MStA, CDA and RA and irregular-shaped sclerotia was observed on CLA, FBSA and AHA culture media. Among eleven different culture media assessed, PDA medium was found as most suitable for growth and sclerotia formation of the *S. sclerotiorum*. Not significant difference was observed in the colour of sclerotia on eleven tested media. It varied from light black (brown) to dark black only.

Table 3: Screening of different culture media for mycelial growth of *Sclerotinia sclerotiorum*

Culture medium	Avg.* radial growth of mycelia at different hrs (mm)			
	24 Hrs.	48 Hrs.	72 Hrs.	96 Hrs.
Potato dextrose agar (PDA)	35.60	51.19	72.33	84.75
Mustard leaf agar (MLA)	27.00	48.66	70.11	82.50
Mustard seed agar (MSeA)	25.45	47.33	65.00	78.25
Mustard seed extract 10% + sucrose 2% agar (MSeESA	21.70	37.66	62.25	72.15
Mustard stem extract 10% + sucrose 2% agar (MStESA)	19.33	34.19	55.55	68.17
Mustard stem agar (MStA)	17.22	28.70	45.50	60.55
Cabbage leaf agar (CLA)	17.77	30.50	43.75	52.27
French bean seed agar (FBSA)	16.33	20.65	30.25	49.65
Czapek's dox agar (CDA)	14.80	17.75	30.70	45.75
Richard's agar (RA)	14.00	17.00	28.55	43.25
Asthana & Hawker's agar (AHA)	12.50	15.55	27.77	41.10

**Data are the mean of five replication*

Similar results supported by Singh *et al.* (2013), Sharma (2021) and Sharma *et al.* (2023). They also reported PDA as the the most suitable medium for the growth and sclerotia formation of *S. sclerotiorum*. Rai et al (2024) reported potato dextrose broth was the suitable medium for growth of *S. sclerotiorum*, with 2.29 mg dry weight per flask. Bharti *et al.* (2015, 2019) investigated the effects of ten solid culture media, including potato dextrose agar, malt extract apple agar, czapek's dox agar, Asthana & Hawker's agar, potato carrot agar, mustard leaf dextrose agar and pea leaf dextrose agar. The minimum radial growth of mycelium was 32 mm and 2.00 sclerotia in Asthana & Hawker's agar medium, whereas the highest radial growth was 82.66 mm and 12.00 sclerotia in PDA medium. Sharma *et al.* (2023) found lettuce leaf agar as the least suitable medium for growth of the fungus which required 7 days for full growth in the Petri plate with average radial growth of 30.65 mm and 1.5 average numbers of sclerotia per Petri plate. The poor growth of mycelium and subsequent sclerotia formation in natural medium, might be due to presence of some inhibitory substances in their extract.

Table 4: Screening of different culture media for sclerotial formation of *Sclerotinia sclerotiorum*

Culture medium	Time taken for first sclerotia formation (hr)	Average diameter(size) of sclerotia (mm)	Average no. of sclerotia/Plate	Weight of sclerotia/plate (mg)	Shape of sclerotia	Colour of sclerotia
Potato dextrose agar (PDA)	96	7.50	14.25	710.00	Spherical to Irregular	Light black
Mustard leaf agar (MLA)	96	6.75	10.55	650.55	Oval	Dark black
Mustard seed agar (MSeA)	96	6.00	8.33	600.50	Oval	Light black
Mustard seed extract 10% + sucrose 2% agar (MSeESA)	96	5.55	7.77	525.50	Oval	Light black
Mustard stem extract 10% + sucrose 2% agar (MStESA)	120	5.25	6.50	625.10	Oval	Light black
Cabbage leaf agar (CLA)	120	5.00	6.40	575.55	Irregular	Light black
Mustard stem agar (MStA)	120	4.75	5.25	475.22	Oval	Light black
French bean seed agar (FBSA)	120	4.25	5.00	425.66	Irregular	Dark black
Czapek's dox agar (CDA)	120	4.15	4.44	415.55	Oval	Dark black
Richard's agar (RA)	120	3.50	4.20	412.22	Oval	Dark black
Asthana & Hawker's agar (AHA)	120	3.15	3.33	355.55	Irregular	Dark black

Effect of different temperatures and pH on growth and sclerotia formation of *S. sclerotiorum*

The effect of specific range of temperatures on the growth of *S. sclerotiorum* was observed at 3 days after inoculation (DAI) and 5 DAI, as shown in Table 5. The highest mycelial growth was recorded after 5 DAI at 20°c (85.62 mm), followed by 25°c (72.35 mm) and 15°c (71.25mm). The least mycelial growth occurred at 35°c (2.71mm). Sclerotial production was also highest at 20°c and lowest at 15°c. The pathogen did not produce any sclerotia at 10°c or temperatures above 30°c. There findings are consistent with those of Panchal *et al.* (2012) Husain and Choudhary (2018) and Shaheer *et al.* (2025). Krishnamoorthy *et al.* (2017) found that temperature influenced the size of sclerotia, with the largest sizes occurring at 25°c. Kumar *et al.* (2004) observed that 20°c was the optimal temperature for mycelial growth, while 20-25°c favoured sclerotial formation, which causes significant stem rot disease.

Table 5: Effect of different temperatures on growth and sclerotial production potential of *sclerotinia sclerotiorum*

Temperature	Mycelial growth *		Number of sclerotia per plate*
	3 DAI** (mm)	5 DAI**(mm)	
10°C	3.75	11.90	0
15°C	30.82	71.25	6
20°C	61.00	85.62	14
25°C	29.55	72.35	7
30°C	4.75	7.75	0
35°C	1.45	2.71	0
SEM±	2.110	3.222	0.410
C.D at 5%	6.266	7.855	1.155

**Average of five replicates, **DAI = Days after inoculation*

The pH preference of most pathogens ranges between 5.0 and 7.5, favouring establishement of pathogens in their host. It is evident from the data presented in Table 6 that of all the pH levels tested, pH 5.0 was found ideal and favoured maximum dry weight of mycelium, followed by pH 4.5 and 5.5. At pH above 5.0, the dry mycelial weight was found to be declined. The least dry mycelial weight was recorded at pH 7.5, which shows that it is unsupportive for the growth of the pathogen. Significantly, a maximum number of sclerotia were formed at pH 5.5 after 14 days of inoculation at 25 ± 2°c temperature. This was followed by pH 5.0 and 4.5. The least number of sclerotia were formed at pH 7.5. Shaheer *et al.* (2025) also found pH 5.0 suitable for vegetative growth of the Fungus. Panchal *et al.* (2012).

Table 6: Effect of different pH on growth and sclerotial production potential of *Sclerotinia sclerotiorum*

pH	Dry weight of mycelium* (mg) at 14 DAI**	Number of sclerotia produced per flask*
4.5	184.5	20.5
5.0	197.6	28.6
5.5	158.2	33.3
6.0	130.4	17.4
6.5	116.8	10.9
7.0	75.5	6.5
7.5	32.1	2.4
SEM±	3.25	1.272
C.D. at 5%	9.72	3.565

**Average of five replicates **DAI = Days after inoculation*

REFERENCES

Anonymous (2015) Directorate of rapeseed-mustard research. www.drmr.res.in

Bharti, O.P., Chouhan, S.S., Shakya, N., Bobade, A. and Pandya, R.K. (2015) Evaluation of different culture medium for most suitable radial mycelial growth of *Sclerotinia sclerotiorum* under *in vitro. Progressive Rresearch - An International Journal* 10: 1968-1970.

Bharti, O. P., Pandya, R.K., Singh, R., Gupta, P.K. and Gupta, J.C. (2019) Epidemiological studies to critical environmental parameters favouring infection and development of disease. *International journal of chemical studies* **7**: 2201- 2204.

Choudhary, C.S., Singh, R.S., Arun, A., Bharati, V., Md Minnatullah and Choudhary, R. K. (2022) Effect of different dates of sowing on incidence of Sclerotinia rot disease of Indian mustard in Bihar. *The Pharma Innovation Journal* **11:** 31-34.

Goswami, K., Tewari, A.K. and Awasthi, R.P. (2012) Cultural, morphological and pathogenic characteristics and carpogenic germination of *Sclerotinia sclerotiorum*, the cause of sclerotinia rot of mustard. *Pantnagar Journal of Research* **10**: 40- 45.

Hansda, S., Nanda, R.K., Dutta, S. and Ray, S.K. (2014) Sclerotinia rot of brinjal and its host range in west Bengal. The

Journal of Plant Protection Sciences 6: 27-30.

Husain, M.A. and Choudhary, C.S. (2018) Morphological, Cultural and Physiological studies on *Sclerotinia sclerotiorum* causing stem rot of oilseed brassica. International *Journal of Current Microbiology and Applied Sciences* **7**: 1044- 1052.

Iqbal, S.M., Ghafoor, A., Ahmad, Z. and Haqqani, A.M. (2003) Pathogenicity and fungicidal efficacy for sclerotinia rot of brinjal. *International Journal of Agriculture and Biology* **5**: 118-120.

Islam, M.R., Prova, A., Akanda, A.M. and Hussain, M.M. (2020) First report of white mould caused by *Sclerotinia sclerotiorum* on Pea in Bangladesh. *Journal of Plant Pathology* **20:** 518.

Kumar, B., Pandey, R. and Verma, A.K. (2004) Effect of temperature and pH on growth and sclerotial formation of *Sclerotinia sclerotiorum* causing stem and root rot of broccoli. *Progressive Agriculture* **4**: 89-90.

Krishnamoorthy, K.K., Sankaralingam, A. and Nakkeeran, S. (2017) Effect of temperature and salanity on the growth of *Sclerotinia sclerotiorum* causing head rot of cabbage. *International Journal of Current Microbiology and Applied Sciences* **6**: 950-954.

Meena, P.D., Rathi, A.S., Kumar, V. and Singh, D. (2014) Compendium of rapeseed-mustard diseases: identification and management. Directorate of Rapeseed-Mustard Research (ICAR), Bharatpur, Rajasthan, PP.30

Panchal, J.A., Patel, K.D., Jaiman, R.K. and Patel, N.R. (2012) Physiological studies of *Sclerotinia sclerotiorum* causing stem rot of Fennel (Foeniculum vulgare Mill.). *International Journal of Seed Spices* **2**: 46- 53.

Prajapati, S., Godika, S., Kumar, N., Lakhran, L., Maurya, S. and Sharma, J. (2020) Isolation, identification and pathogenicity of *Sclerotinia sclerotiorum* causing sclerotinia rot of chilli*. Journal of Pharmacognosy and Phytochemistry* **9**: 20- 23.

Rai, D., Ranjan, R.K. and Dwivedi, M. (2024) Detection of sclerotinia rot of basil caused by *Sclerotinia sclerotiorum* for the first time in Bihar, India*. Australasian Plant Disease Notes* **19**: 17.

Rakesh, Rathi, A.S., Kumar, P., Kumar, A. and Kumari, P. (2016) Sclerotinia rot of rapeseed mustard: A comprehensive review. *Journal of Applied and Natural Science* **8**: 2325- 2336.

Singh, M., Sharma, O.P., Bhagat, S. and Pandey, N. (2013) Effect of systemic fungicides, culture media, temperature and pH on growth of *Sclerotinia sclerotiorum* (Lib.) de Bary causing white mold of chickpea. *Annual Review Plant Science* **21**: 136-139.

Sharma, P., Meena, P.D., Verma, P.R., Saharan, G.S., Mehta, N. and Singh, D. (2015) *Sclerotinia sclerotiorum* (Lib.) de Bary. M.Sc. Thesis, Department of Plant Pathology, RVSKVV, College of Agriculture, Gwalior, M.P., PP 43- 44.

Sharma, S., Pandya, R.K., Fatehpuria, P.K., Prajapati, S. and Trivedi, H.K. (2023) Assessment of different culture media on growth and sclerotia formation of *Sclerotinia sclerotiorum* (Lib.) de Bary. *The Pharma Innovation Journal* **12:** 5816- 5819.

Shaheer, M.A., Khan, R.U., Hasmi, S.K. and Kumari, N. (2025). Characterization of *Sclerotinia sclerotiorum* causing stem rot of brinjal*. Journal of Advances in Biology and Biotechnology* **28**: 896-901.

Sharma, P., Verma, P.R., Meena, P.D. kumar, V. and Singh, D. (2016) Research progress analysis of sclerotinia rot (*Sclerotinia sclerotiorum*) of oilseed brassicas through bibliography. *Journal of Oilseed Brassica* **1**: 45- 125.