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Cross-Host Infectivity of *Sclerotium rolfsii* associated with Finger Millet foot rot

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Abstract

Foot rot caused by *Sclerotium rolfsii* Sacc., is an important soil borne disease that poses a serious threat to finger millet (*Eleusine coracana* L. Gaertn.) cultivation by causing significant plant mortality and yield losses. The present study was conducted to evaluate the host range of a highly virulent isolate of *S. rolfsii* (SrVcM) and assess its impact on disease development and plant growth parameters in different millet species under greenhouse conditions. Nine millet crops, namely browntop millet, kodo millet, proso millet, little millet, foxtail millet, barnyard millet, pearl millet, sorghum and finger millet, were grown in pathogen infested soil and monitored up to 60 days after sowing. Disease initiation was first observed at 30 DAS in proso millet and finger millet, while little millet exhibited symptoms at 45 DAS. Finger millet was found to be the most susceptible host, recording the highest disease severity score (4.6), seedling mortality (68.7%), pathogen re-isolation frequency (100%) and growth reduction (58.7%) compared to the healthy control. Proso millet and little millet showed moderate susceptibility, with disease severity scores of 2.3 and 1.8, respectively, accompanied by notable reductions in plant height, root length and fresh biomass. In contrast, browntop millet, kodo millet, foxtail millet, barnyard millet, pearl millet and sorghum remained symptomless throughout the study, exhibiting no disease incidence, mortality or pathogen recovery. Statistical analysis revealed significant differences among millet hosts for disease and growth parameters. The results confirmed the differential pathogenicity of *S. rolfsii* among millet species and identified proso millet and little millet as potential alternate hosts that may facilitate pathogen survival and inoculum buildup. Conversely, the resistant reaction observed in browntop millet, kodo millet, foxtail millet, barnyard millet, pearl millet and sorghum highlights their potential utility in crop rotation programmes for sustainable management of foot rot disease in finger millet-based production systems.

Keywords: *Sclerotium rolfsii*, finger millet, foot rot, host range, disease severity, pathogenicity, alternate hosts, crop rotation

Introduction

Finger millet (*Eleusine coracana* L. Gaertn.), commonly known as ragi, bird's foot millet, mandua, nagli and nachni, is one of the most important small millets cultivated in tropical and subtropical regions of Asia and Africa. The crop originated in the Ethiopian highlands and was subsequently introduced into India, where it has become an important staple food crop due to its adaptability to diverse agro-climatic conditions and resilience under marginal environments (Phillips, R.W., 1966) [2]. Finger millet is nutritionally superior to many cereals because of its high calcium, dietary fibre, essential amino acids, vitamins and mineral contents, making it an important food source for nutritional security (Malleshi and Hadimani, 1993) [7]. Owing to its low glycaemic index and gluten-free nature, finger millet is increasingly recognized as a functional food beneficial for diabetic patients and individuals with celiac disease (Geetha *et al.*, 2020) [8].

India is the leading producer of finger millet, accounting for a major share of global production with Karnataka being the principal cultivating state. Despite its inherent tolerance to drought and environmental stresses, finger millet productivity is constrained by several diseases caused by fungi, bacteria, viruses and nematodes (Govindu and Shivanandappa, 1967) [9]. Among fungal diseases, foot rot caused by *Sclerotium rolfsii* Sacc., has emerged as an important soil-borne disease, particularly under irrigated and high rainfall conditions, causing severe yield losses and threatening sustainable crop production.

Sclerotium rolfsii is a ubiquitous necrotrophic fungus belonging to the family *Atheliaceae* with the teleomorphic stage *Atheliorolfsii* (Tu and Kimbrough, 1978) [10]. The pathogen survives in soil through resilient sclerotia and infects plants primarily at the collar region, resulting in tissue rotting, wilting and eventual plant death (Kwon *et al.*, 2017) [6]. The fungus possesses an exceptionally broad host range, infecting more than 500 plant species including cereals, pulses, oilseeds, vegetables, ornamentals and medicinal plants (Aycok, 1966) [1]. Important hosts include groundnut, soybean, chickpea, chilli, onion, potato, tomato, wheat, barley and finger millet (Desai and Schlosser, 1999) [5]. In finger millet, foot rot disease can cause substantial reductions in grain and fodder yield, with losses reported up to 27.40 and 23.31 per cent, respectively (Pawar *et al.*, 2013) [3].

The wide host range of *S. rolfsii* contributes significantly to its persistence and epidemiology in agricultural ecosystems. Alternate and collateral hosts facilitate long-term survival of the pathogen in soil and serve as reservoirs for inoculum, increasing disease incidence in subsequent crops. Therefore, understanding host susceptibility is essential for developing suitable crop rotation strategies and integrated disease management practices. Host range studies help identify susceptible and resistant plant species, elucidate crossinfectivity patterns and improve understanding of pathogen ecology and survival mechanisms (Punja, 1985) [4]. In addition to broad host adaptability, *S. rolfsii* populations exhibit considerable variability in morphological, cultural, pathogenic and genetic characteristics. Variations among isolates have been documented with respect to colony morphology, sclerotial production, growth rate, virulence and aggressiveness across hosts and geographical regions (Cooper, 1961; Kim, 1974; Punja, 1985) [11, 12, 4]. Such pathogenic variability influences disease severity and host specificity, thereby posing challenges for breeding resistant cultivars and designing effective management strategies. Understanding variability among pathogen isolates is therefore important for identifying highly virulent strains and predicting disease outbreaks.

Characterization of pathogenic variability coupled with host range assessment provides crucial insights into the epidemiology and evolution of *S. rolfsii* populations. Information on differential virulence and host adaptation can support resistance breeding programmes and facilitate the development of targeted disease management strategies. Hence, the present investigation was undertaken to study the host range and pathogenic variability of *Sclerotium rolfsii* causing foot rot in finger millet with the objective of understanding its infectivity across different crop species and variability in pathogenic behaviour among isolates.

Materials and Methods

Isolation of the Pathogen

Finger millet plants exhibiting typical foot rot symptoms at the collar and stem base regions were collected. Small pieces (5-10 mm) from the advancing margins of infected tissues were excised and surface sterilized in 1% sodium hypochlorite solution for 1 min, followed by three rinses in sterile distilled water. The sterilized tissue pieces were aseptically transferred onto potato dextrose agar (PDA) plates and incubated at 27±1 °C for 3 days. Emerging fungal colonies were transferred to fresh PDA plates and purified

by the hyphal tip culture technique. Pure cultures obtained from different samples were maintained on PDA slants and designated as individual isolates.

Hyphal Tip Culture

To obtain genetically pure cultures, hyphal tip isolation was carried out on 2% water agar medium. A dilute mycelial suspension (10⁻⁶ dilution) was prepared in sterile distilled water and 1 mL was spread uniformly on water agar plates. Under a microscope, actively growing hyphal tips were identified and marked. Small mycelial fragments from the hyphal tips were aseptically transferred to PDA plates and incubated at 27±1 °C until sufficient growth was obtained. Pure cultures were maintained for further studies.

Identification of the Pathogen

The fungal isolate was identified based on its cultural and morphological characteristics. On PDA, the pathogen produced abundant cottony white mycelial growth, which later became dull white. Spherical to irregular mustard seed-like sclerotia developed after 6-7 days of incubation and gradually changed from white to brown upon maturity. Based on these characteristics, the pathogen was identified as *Sclerotium rolfsii* Sacc.

Maintenance of Cultures

Pure culture of *S. rolfsii* was maintained on PDA slants and incubated at 27±1 °C for 10 days. The cultures were subsequently stored at 4 °C and sub-cultured at monthly intervals to maintain viability.

Mass Multiplication of Inoculum

Sorghum grains were used for mass multiplication of the pathogen. The grains were soaked in water for 24 h and 250 g of grains were filled into autoclavable polypropylene bags. The grains were sterilized at 121 °C (1.1 kg cm² pressure) for 20 min. After cooling, two to three 5-mm² mycelial discs from actively growing cultures of *S. rolfsii* were inoculated into each bag under aseptic conditions. The inoculated bags were incubated at 28 °C for 30 days and shaken periodically to ensure uniform colonization. Fully colonized sorghum grains were used as inoculum for preparing sick soil.

Soil Sterilization and Preparation of Sick Soil

A potting mixture consisting of red sandy loam soil, sand, and compost in the ratio of 1:1:0.5 was sterilized by drenching with 4% formaldehyde solution until saturation. The treated soil was covered with a polyethylene sheet for five days and subsequently exposed to open air for seven days to allow complete dissipation of formaldehyde residues. For preparation of sick soil, 20 dayold *S. rolfsii* inoculum grown on sorghum grains was thoroughly mixed with the sterilized potting mixture. The inoculated soil was filled into pots and maintained under suitable moisture conditions to facilitate pathogen establishment.

Host Range Studies

Seeds of different millet species were surface sterilized with 0.1% sodium hypochlorite solution, washed thoroughly with sterile distilled water and sown in pathogeninfested soil. Pots without pathogen inoculum served as controls. Alternate wetting and drying conditions were maintained throughout the experiment to promote disease development.

The millet species evaluated for susceptibility to *S. rolfsii* are listed below:

Sl. No	Common name	Botanical name
1.	Browntop millet	<i>Urochloa ramosa</i>
2.	Kodo millet	<i>Paspalum scrobiculatum</i>
3.	Proso millet	<i>Panicum miliaceum</i>
4.	Little millet	<i>Panicum sumatrense</i>
5.	Foxtail millet	<i>Setaria italica</i>
6.	Barnyard millet	<i>Echinochloa esculenta</i>
7.	Pearl millet	<i>Pennisetum glaucum</i>
8.	Sorghum	<i>Sorghum bicolor</i>
9.	Finger millet(with inoculum)	<i>Eleusine coracana</i>
10.	Finger millet (without inoculum)	<i>Eleusine coracana</i>

The following formula is used to calculate the percent disease incidence and incubation period,

Percent Disease Incidence (PDI)

$$\text{PDI (\%)} = \frac{\text{Number of infected plants}}{\text{Total number of plants observed}} \times 100$$

Results and Discussion

The host range study conducted under greenhouse conditions revealed differential susceptibility of small millet species to the highly virulent isolate of *Sclerotium rolfsii* (SrVcM), the causal agent of foot rot in finger millet. Disease development was monitored at 15, 30, 45 and 60 days after sowing (DAS), and the results demonstrated significant variation in host response among the millet species tested.

No symptoms of foot rot were observed in any of the test crops up to 15 DAS, indicating the absence of early infection and establishment of the pathogen during the initial growth stages. The first appearance of disease symptoms was recorded at 30 DAS in proso millet (*Panicum miliaceum*) and inoculated finger millet (*Eleusine coracana*). Initial symptoms included slight yellowing of lower leaves and the formation of small water-soaked lesions at the collar region.

As the crop advanced to 45 DAS, disease progression increased in susceptible hosts. Little millet (*Panicum sumatrense*) exhibited initial infection symptoms, whereas proso millet and inoculated finger millet showed increased disease severity characterized by enlargement of collar lesions, yellowing, wilting, and partial drying of affected plants. Among all the millet species evaluated, finger millet

exhibited the highest susceptibility to *S. rolfsii*, showing rapid disease progression and extensive colonization of the collar region.

At 60 DAS, severe foot rot symptoms were observed in inoculated finger millet plants, including extensive collar rot, profuse white mycelial growth, abundant sclerotial formation, complete wilting and plant death. Proso millet and little millet exhibited moderate disease development with visible collar lesions and partial wilting, indicating their susceptibility as alternate hosts of the pathogen. In contrast, brown top millet (*Urochloa ramosa*), kodo millet (*Paspalum scrobiculatum*), foxtail millet (*Setaria italica*), barnyard millet (*Echinochloa esculenta*), pearl millet (*Pennisetum glaucum*) and sorghum (*Sorghum bicolor*) remained symptomless throughout the experimental period and were categorized as resistant or non-host species under the conditions of the study.

The ability of *S. rolfsii* to infect proso millet and little millet in addition to finger millet indicates the existence of collateral hosts that may facilitate survival and perpetuation of the pathogen in millet-based cropping systems. Such alternate hosts can contribute to inoculum build-up in soil and increase disease risk in subsequent susceptible crops. The absence of infection in several millet species suggests their potential suitability for crop rotation strategies aimed at reducing pathogen populations in infested fields.

The findings of the present investigation corroborate earlier reports describing the broad host range of *S. rolfsii*. Aycok (1966) ^[1] reported that the pathogen infects more than 500 plant species belonging to diverse botanical families. Similarly, Punja (1985) ^[4] highlighted the remarkable ecological adaptability and host diversity of *S. rolfsii*, which contributes to its persistence in agricultural ecosystems. Host range studies conducted by Epps *et al.* (1951) ^[13] demonstrated variability in pathogenicity among different isolates of *S. rolfsii* on various hosts. Furthermore, Shwetha (2012) ^[14] reported that *S. rolfsii* causing wilt of *Stevia rebaudiana* infected several medicinal and aromatic plants, confirming the pathogen's capacity for cross-host infectivity. The present study establishes that finger millet is the most preferred host of the highly virulent isolate SrVcM, while proso millet and little millet can serve as alternate hosts under favorable conditions. The resistant reaction observed in brown top millet, kodo millet, foxtail millet, barnyard millet, pearl millet, and sorghum indicates their potential utility in designing sustainable crop rotation systems for effective management of foot rot disease caused by *Sclerotium rolfsii*.

Table 1: Reaction of highly virulent isolate of *Sclerotium rolfsii* (SrVcM) on other small millets at different intervals

Sl. No.	Cultivars	Initiation of foot rot on different days of intervals			
		15 DAS	30 DAS	45 DAS	60 DAS
1	Browntop millet	-	-	-	-
2	Kodo millet	-	-	-	-
3	Proso millet	-	+	+	++
4	Little millet	-	-	+	++
5	Foxtail millet	-	-	-	-
6	Barnyard millet	-	-	-	-
7	Pearl millet	-	-	-	-
8	Sorghum	-	-	-	-
9	Finger millet (with inoculum)	-	+	++	+++
10	Finger millet (without inoculum)	-	-	-	-

*(+)-infection occur(++)-moderate progress of disease(+++)-severe form(-)-indicates no infection

The pathogenic response of different millet species to the highly virulent isolate of *Sclerotium rolfsii* was assessed through disease severity, seedling mortality, plant survival, and pathogen re-isolation studies (Table 2). Significant differences in host susceptibility were observed among the millet species tested.

Among all the hosts evaluated, inoculated finger millet (*Eleusine coracana*) exhibited the highest disease severity score (4.6 on a 0-5 scale), accompanied by maximum seedling mortality (68.7%) and the lowest plant survival (31.3%). The pathogen was successfully reisolated from all symptomatic plants, resulting in 100 per cent pathogen recovery. The severe disease reaction observed in finger millet confirms its high susceptibility to *S. rolfsii* and demonstrates the aggressive nature of the isolate used in the study.

Moderate disease development was recorded in proso millet (*Panicum miliaceum*) and little millet (*Panicum sumatrense*). Proso millet exhibited a disease severity score of 2.3, with 28.5 per cent seedling mortality and 71.5 per cent plant survival. Similarly, little millet recorded a disease severity score of 1.8, seedling mortality of 20.0 per cent, and plant survival of 80.0 per cent. Pathogen re-isolation frequencies of 82.0 and 75.0 per cent were obtained from proso millet and little millet, respectively, confirming successful infection and colonization by *S. rolfsii*. These findings indicate that both crops can serve as alternate hosts and may contribute to pathogen survival in millet-based cropping systems.

In contrast, brown top millet (*Urochloa ramosa*), kodo millet (*Paspalum scrobiculatum*), foxtail millet (*Setaria italica*), barnyard millet (*Echinochloa esculenta*), pearl millet (*Pennisetum glaucum*), and sorghum (*Sorghum bicolor*) showed complete resistance under greenhouse conditions. No disease symptoms were observed on these hosts, resulting in zero disease severity, no seedling mortality, 100

per cent plant survival, and absence of pathogen re-isolation. Likewise, the uninoculated finger millet control remained symptomless throughout the experimental period. These results suggest that these millet species are either non-hosts or possess effective resistance mechanisms that restrict pathogen infection and establishment.

Statistical analysis revealed significant differences among the millet hosts for disease severity, seedling mortality, plant survival, and pathogen re-isolation. The calculated SEM ($\pm$) values were 0.18, 2.36, 2.36, and 3.12, respectively, while the corresponding CD values at 5 per cent probability were 0.54, 7.08, 7.08, and 9.36, indicating that the observed differences among susceptible and resistant hosts were statistically significant.

The present findings support earlier reports describing the broad host range and pathogenic variability of *S. rolfsii*. Aycock (1966)^[1] reported that the pathogen infects a wide range of cultivated crops and weeds, enabling its long-term persistence in agricultural soils. Punja (1985)^[4] further emphasized that alternate hosts play a crucial role in pathogen survival and disease epidemiology. Similar host range studies conducted on other crop-pathogen systems have demonstrated varying levels of susceptibility among related plant species, reflecting differences in host defense mechanisms and pathogen adaptation.

The successful infection of proso millet and little millet indicates their potential role as collateral hosts capable of maintaining inoculum between cropping seasons. Conversely, the resistant reaction observed in brown top millet, kodo millet, foxtail millet, barnyard millet, pearl millet, and sorghum highlights their potential suitability in crop rotation programmes aimed at reducing soil inoculum levels. Therefore, inclusion of these resistant millet species in cropping systems may contribute to sustainable management of foot rot disease caused by *Sclerotium rolfsii* in finger millet-growing regions.

Table 2: Disease severity and seedling mortality of different millet hosts challenged with *Sclerotium rolfsii*

Crop	Disease Severity (0-5 Scale)	Seedling Mortality (%)	Plant Survival (%)	Pathogen Re-isolation (%)
Brown top millet	0.0	0.0	100.0	0.0
Kodo millet	0.0	0.0	100.0	0.0
Proso millet	2.3	28.5	71.5	82.0
Little millet	1.8	20.0	80.0	75.0
Foxtail millet	0.0	0.0	100.0	0.0
Barnyard millet	0.0	0.0	100.0	0.0
Pearl millet	0.0	0.0	100.0	0.0
Sorghum	0.0	0.0	100.0	0.0
Finger millet (Inoculated)	4.6	68.7	31.3	100.0
Finger millet (Control)	0.0	0.0	100.0	0.0
SEm $\pm$	0.18	2.36	2.36	3.12
CD (P = 0.05)	0.54	7.08	7.08	9.36

The effect of *Sclerotium rolfsii* infection on plant growth parameters of different millet hosts was evaluated at 60 days after sowing (DAS) under greenhouse conditions (Table 3). Significant variations were observed among the millet species with respect to plant height, root length, fresh biomass accumulation, and percentage reduction over control, indicating differential host responses to pathogen infection.

Among the tested hosts, inoculated finger millet (*Eleusine coracana*) exhibited the greatest reduction in growth parameters due to severe infection by *S. rolfsii*. The infected plants recorded the lowest plant height (18.6 cm), root

length (6.4 cm), and fresh weight (4.8 g plant⁻¹), corresponding to a 58.7 per cent reduction in growth compared to the healthy control. The marked reduction in plant growth may be attributed to extensive collar rot and root damage caused by the pathogen, which adversely affected water and nutrient uptake, resulting in stunted growth and reduced biomass production.

Moderate reductions in growth were observed in proso millet (*Panicum miliaceum*) and little millet (*Panicum sumatrense*), which were identified as susceptible alternate hosts. Proso millet recorded a plant height of 28.7 cm, root length of 9.2 cm, and fresh weight of 7.3 g plant⁻¹,

representing a 33.4 per cent reduction over the control. Similarly, little millet exhibited a plant height of 31.4 cm, root length of 10.5 cm, and fresh weight of 8.4 g plant⁻¹, with a reduction of 26.8 per cent. The decrease in growth parameters in these hosts indicates successful colonization by the pathogen and consequent impairment of physiological processes essential for normal plant development.

In contrast, browntop millet (*Urochloa ramosa*), kodo millet (*Paspalum scrobiculatum*), foxtail millet (*Setaria italica*), barnyard millet (*Echinochloa esculenta*), pearl millet (*Pennisetum glaucum*), and sorghum (*Sorghum bicolor*) exhibited growth characteristics comparable to healthy plants and showed no reduction in plant height, root length, or fresh weight. *Sorghum* recorded the highest plant height (48.5 cm), root length (16.2 cm), and fresh biomass (14.2 g plant⁻¹), followed by pearl millet, indicating the absence of pathogen-induced growth suppression. These observations corroborate the host range studies, which revealed no disease symptoms on these millet species.

The uninoculated finger millet control maintained normal growth with a plant height of 45.1 cm, root length of 15.1 cm, and fresh weight of 11.7 g plant⁻¹, further confirming that the reductions observed in inoculated plants were directly associated with pathogen infection.

Statistical analysis demonstrated significant differences among the millet hosts for all growth parameters studied. The standard error of mean (SEm $\pm$) values for plant height, root length, fresh weight, and reduction over control were

1.24, 0.48, 0.39, and 2.85, respectively. The corresponding critical difference (CD) values at the 5 per cent level of significance were 3.72, 1.44, 1.17, and 8.55, indicating that the reductions recorded in finger millet, proso millet, and little millet were statistically significant compared with the resistant hosts.

The reduction in growth parameters observed in susceptible hosts may be attributed to the necrotrophic nature of *S. rolfii*, which produces cell wall-degrading enzymes and oxalic acid that facilitate tissue maceration and destruction of vascular tissues. Such damage interferes with translocation of water and nutrients, ultimately reducing plant vigour and biomass accumulation. Similar reductions in plant growth and biomass due to *S. rolfii* infection have been reported in several crops, including groundnut, tomato, chilli, and finger millet. Punja (1985)^[4] emphasized that severe infection by *S. rolfii* often results in extensive root and collar rot, leading to reduced plant growth, premature senescence, and significant yield losses.

The present study clearly demonstrates that *S. rolfii* infection adversely affects growth and biomass production in susceptible millet hosts, particularly finger millet. The absence of growth reduction in brown top millet, kodo millet, foxtail millet, barnyard millet, pearl millet, and sorghum further supports their resistant or non-host status and highlights their potential suitability in crop rotation programmes for managing foot rot disease in finger millet-based production systems.

Table 3: Effect of *Sclerotium rolfii* infection on plant growth parameters at 60 DAS

Crop	Plant Height (cm)	Root Length (cm)	Fresh Weight (g plant ⁻¹)	Reduction over Control (%)
Browntop millet	42.8	14.6	12.8	0.0
Kodo millet	39.5	13.8	11.6	0.0
Proso millet	28.7	9.2	7.3	33.4
Little millet	31.4	10.5	8.4	26.8
Foxtail millet	41.6	14.1	12.1	0.0
Barnyard millet	40.3	13.9	11.9	0.0
Pearl millet	46.8	15.4	13.5	0.0
Sorghum	48.5	16.2	14.2	0.0
Finger millet (Inoculated)	18.6	6.4	4.8	58.7
Finger millet (Control)	45.1	15.1	11.7	-
SEm $\pm$	1.24	0.48	0.39	2.85
CD (P = 0.05)	3.72	1.44	1.17	8.55

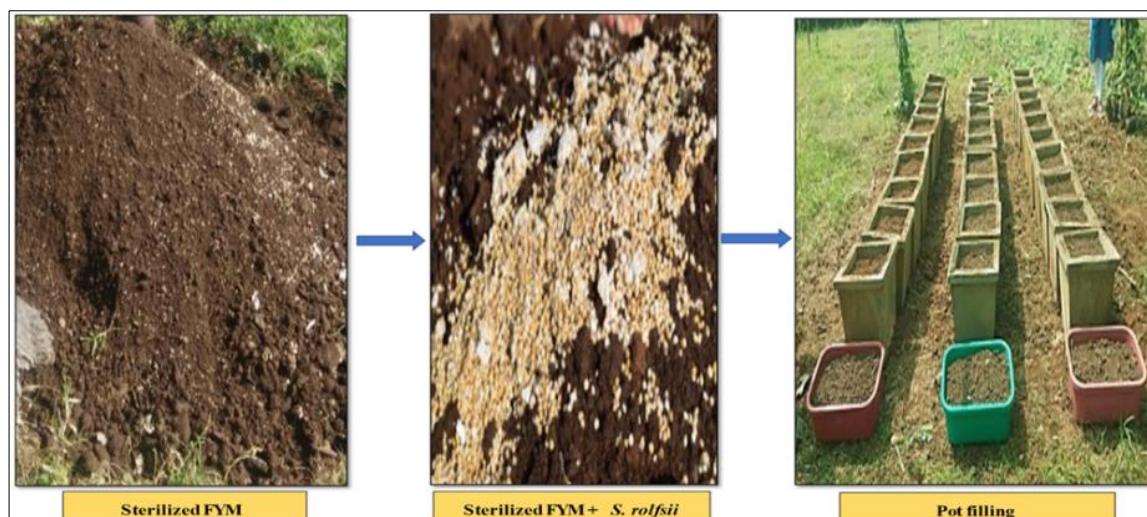


Fig 1: Preparation of *S. rolfii*-Infested FYM



Plate 1: Diagrammatic representation of host range studies of *S. rolfsii* of finger millet with other small millets



Fig 2: Reaction of Proso Millet to *S. rolfsii*



Fig 3: Reaction of Little Millet to *S. rolfsii*



Plate 2: Host range studies of *S. rolfsii*

Scale	Symptoms
0	No symptoms
1	Small lesion at collar region
2	Lesion covering $\leq 25\%$ collar circumference
3	Lesion covering 26-50%, slight wilting
4	Extensive lesion $>50\%$, severe wilting
5	Complete plant collapse/death

The highly virulent isolate (SrVcM) exhibited differential pathogenicity among the tested millet hosts. Finger millet recorded the shortest incubation period (26.4 days), highest disease incidence (78.6%), and maximum collar lesion length (4.5 cm), indicating high susceptibility. Proso millet exhibited moderate susceptibility with 32.5 per cent disease incidence and lesion length of 1.8 cm. Little millet showed comparatively lower susceptibility with 24.7 per cent disease incidence and 1.2 cm lesion length. Browntop

millet, kodo millet, foxtail millet, barnyard millet, pearl millet, and sorghum remained symptomless throughout the experimental period, suggesting resistance or non-host status against *S. rolfsii*.

The study demonstrated that the *S. rolfsii* isolate causing foot rot in finger millet possesses a limited host range among small millets. Finger millet was identified as the most susceptible host, while proso millet and little millet served as alternate hosts with moderate susceptibility. The absence of disease symptoms in browntop, kodo, foxtail, barnyard, pearl millet, and sorghum indicates their potential suitability in crop rotation programs aimed at reducing inoculum build-up in fields infested with *S. rolfsii*. These findings provide valuable information for developing integrated disease management strategies and designing sustainable millet-based cropping systems.

Table 4: Disease incidence of *Sclerotium rolfsii* on different millet hosts under greenhouse conditions

Sl. No.	Crop	Incubation Period (Days)	Disease Incidence (%) at 60 DAS	Mean Collar Lesion Length (cm)	Reaction
1	Browntop millet	No symptoms	0.0	0.0	Resistant
2	Kodo millet	No symptoms	0.0	0.0	Resistant
3	Proso millet	28.7	32.5	1.8	Moderately Susceptible
4	Little millet	42.3	24.7	1.2	Moderately Susceptible
5	Foxtail millet	No symptoms	0.0	0.0	Resistant
6	Barnyard millet	No symptoms	0.0	0.0	Resistant
7	Pearl millet	No symptoms	0.0	0.0	Resistant
8	Sorghum	No symptoms	0.0	0.0	Resistant
9	Finger millet (Inoculated)	26.4	78.6	4.5	Highly Susceptible
10	Finger millet (Control)	No symptoms	0.0	0.0	Resistant
SEM $\pm$		1.27	2.14	0.18	-
CD (P=0.05)		3.81	6.42	0.54	-

Conclusion

The present investigation demonstrated that the highly virulent isolate of *Sclerotium rolfsii* (SrVcM) exhibited differential pathogenicity among selected millet species. Finger millet was identified as the most susceptible host, recording the highest disease severity, seedling mortality, pathogen re-isolation frequency, and significant reductions in plant growth parameters. Proso millet and little millet also supported pathogen infection and showed moderate disease development, indicating their potential role as alternate hosts that may facilitate pathogen survival and dissemination. In contrast, brown top millet, kodo millet, foxtail millet, barnyard millet, pearl millet, and sorghum remained symptomless and showed no significant adverse effects on growth, suggesting their resistant or non-host status. Infection by *S. rolfsii* markedly reduced plant height, root length, and fresh biomass in susceptible hosts, highlighting its detrimental impact on crop establishment and productivity. Successful re-isolation of the pathogen from infected plants confirmed its pathogenicity and fulfilled Koch's postulates. These findings enhance our understanding of the host range and epidemiology of foot rot disease in millet-based cropping systems and emphasize the importance of resistant millet species in disease management. Incorporation of resistant crops such as brown top millet, kodo millet, foxtail millet, barnyard millet, pearl millet, and sorghum in crop rotation programmes may help reduce soil inoculum levels and minimize foot rot incidence in finger millet-growing regions. Furthermore, the results

provide a valuable foundation for future studies on host resistance, host-pathogen interactions, and the development of integrated management strategies against *S. rolfsii*.

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