Short communication

Isolation and cultural, morphological characterization of *Sclerotium rolfsii* causing seedling blight in rice

Abstract

In Telangana state, India, around June 2021, the seedling blight of rice was seen in nursery beds 10 days after sowing (DAS).*Sclerotium rolfsii* was the disease's causative agent. Infected plant samples were gathered in farmer's paddy nurseries in the Telangana state of India during *kharif* 2021 as part of the Rice Production Oriented Survey (POS) in farmer fields in Katkur (Village), Akkannapeta (Mandal), Siddipet (District). The farmer uses a seed called PAN 152 from a private company. The affected rice seedlings showed the typical signs of soft rot, yellowing, and white cottony mould growth. Spherical-shaped dark brown sclerotial bodies were also seen in the basal stem region of the infected seedlings.

Key terms: Sclerotial bodies, *Sclerotium rolfsii*, seedling blight and rice

Comment [SD1]: The abstract lacks key objectives, methods, results, and conclusions of the communication.

Introduction

Rice (*Oryza sativa* L.) is one of the most significant and commonly grown crops, accounting for around 27.08% of all cultivated land and producing 23.9 % of all agricultural output in India (www.usda.gov.in). In Telangana, during the *kharif* and *rabi* seasons of 2021–2022, rice is mostly grown along canals, tanks, and bore wells across an area of about 129.78 lakh acres. The rice crop is afflicted by a variety of ~~illnesses~~ diseasesbrought on by fungi, bacteria, viruses, nematodes, and other parasites.~~, and~~Ff~~f~~ungal diseases are one of the main causes of the significant yield losses (40%) in the rice crop (Kindo *et al.*, 2015). *Sclerotium rolfsii*Sacc. is a new and harmful soil-borne plant pathogen that affects a wide range of hosts and is frequently seen in tropical and warm climates. It causes root rot, stem rot, wilt, and foot rot in a variety of crops (Farr *et al.*, 1989). *S. rolfsii* is unique in that it produces persistent sclerotia and abundant mycelial growth, which aid in the survival of the organism and the progression of plant disease (Kokub*et al*., 2007).

Comment [SD2]: This introduction is incomplete. Clearly state the purpose and scope of the communication.
Provide background information and briefly review relevant literature.
State the specific objectives or hypotheses of the study

Comment [SD3]: Whats your proof that its new?

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Comment [SD4]: This is similar with S. sclerotiorum. You need to find the uniqueness of S.rolfsii.

Materials and methods

The samples of infected plants were taken during the *kharif* of 2021 from a farmer's paddy nursery in the Indian state of Telangana's Katkur (Village), Akkannapeta (Mandal), and Siddipet (District).With the use of a sterile scalpel, the infected seedling tissue and some healthy tissue were cut into pieces and surface sterilised with 1% sodium hypochlorite solution for one minute. They were then rinsed three times in sterile distilled water and dried with sterilised filter paper. The sample was surface sterilised and then inoculated on~~put on~~ Potato Dextrose Agar (PDA) medium before being put in a BOD incubator at 28±2^{o}C (Ref). After five to seven days (be specific? How many days), the inoculated pieces' fungal growth was checked, and single colonies were aseptically transplanted into PDA slants. According to Lilly and Barnett (1951), the pathogen was purified using the hyphal tip method. The fungus linked to seedling blight have been provisionally identified as *Sclerotium* spp. based on their

morphological and cultural characteristics (how?, explain how you performed the morphological and cultural characterisation..

Pathogenicity

Rice cultivar (cv.TN1) and sorghum grains were sterilised in 500 ml conical flasks in an autoclave at 121°C and 15lb pressure after being soaked in water overnight, air dried for two hours, and then tested for pathogenicity. A sterilised sorghum grain was inoculated with mycelial discs (5 mm) containing the seedling blight pathogen, which were then incubated for 10–12 days at 28°C ref. The fungal culture was introduced to sterilised soil at a rate of 2g per kg of soil in pots. Rice cultivar TN1 seeds were sown in inoculated pots seven days after inoculation, with sterilised soil devoid of fungal culture serving as the control. The pots were set up in a greenhouse at 28^0 C and 51% relative humidity. After 20–25 days from sowing, all of the seedlings in the inoculated pots exhibited signs that were the same as those seen in the field. The control seedlings did not contract any diseases. Based on morphological traits, the pathogen's identity was confirmed after it was re-isolated from the afflicted seedlings(show us figures comparing the cultures and the control..

Cultural and Morphological identification of *Sclerotium rolfsii*

The pathogen's mycelial development on PDA medium is wave-like and whitish in colour. After 11 days, thin mycelium and sclerotia form near the edge of the cultured plate, and little whitish sclerotial bodies transform into dark brown pigment. The pathogen's pure culture was sent to the Indian Type Culture Collection (ITCC), IARI, New Delhi, for diagnosis. *Sclerotium rolfsii*, with reference number pp/22-23/892 of ITCC, New Delhi, has been identified as the pathogen in rice.

Comment [SD5]: Identified as what?. Give the taxonomy of the identified pathogen

References

Comment [SD6]: Add more and recent references

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Fig.**1(a**) Infected nursery bed

(b) Rotting symptoms

(c) White mycelial growth on basal portion of the seedlings

(d) Dark brown colorsclerotial bodies

Fig.**2** Pure culture of *Sclerotium rolfsii*