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RESEARCH NOTE

COLLAR ROT OF MAIZE CAUSED BY *SCLEROTIUM ROLFSII* IN PAKISTAN

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INTRODUCTION

Sclerotium rolfsii Sacc. is an aggressive soil-borne facultative parasite of over 200 plants and is worldwide in distribution throughout the tropics and subtropics (Aycock, 1966). It has also been found on sunflower (Mirza and Khokhar, 1985), soybean (Beg and Mirza, 1986) and chick-pea (Bashir et al., 1986) in Pakistan.The most characteristic effect of this pathogen is the rotting of affected tissue due to propectinase and depolymerase enzymes (Hussain, 1957). *Sclerotium rolfsii* on ear husks of maize (*Zea mays* L.) var. 'Shaheen' was observed for the first time in the country in 1983 after heavy rainfall and under warm and humid conditions at the National Agricultural Research Centre (NARC), Islamabad (Yasmin et al., 1984). During *kharif* 1984, disease symptoms appeared as yellowing of leaves followed by collapse. Light brown lesions developed at the collar region extending upto 3 cm above the soil level with numerous small spherical white and tan to brown sclerotia measuring 0.5-2.0mm similar to mustard seed size formed on the infected collar region depending upon the stage of maturity.

This paper presents studies on the cultural characteristics of the pathogen and determination of its pathogenicity in the artificial infested soil.

METHODOLOGY

Isolation

Typical infected plants were collected and 3-5mm thick tissue sections were surface sterilized with one percent sodium hypochlorite solution for 2 min, rinsed thrice in sterilized distilled water (SDW) and dried on sterile filter paper at room temperature. Then placed on potato dextrose agar (PDA) amended with 100 μg/ml streptomycine sulphate and incubated at 22°C for 15 days. Thus, the pure culture of the pathogen was isolated and subsequently maintained on PDA.

Pathogenicity Tests

For testing the pathogenicity, small clay pots filled with fertile medium loam field soil were kept in paper bags and autoclaved for two hours. Fifteen to twenty days' old sclerotia of the pathogen multiplied on PDA in petri dishes were mixed into the soil in the ratio of 50:1 (w:w) as described by Chakravarty and Bhowmik (1983). Maize seeds of susceptible variety 'Shaheen' were surface disinfected in one percent solution of sodium hypochlorite for 1 min and rinsed 5 times with SDW. The seeds were sown in pots containing infested soil with sclerotia and uninfested control. The pots were kept under the controlled environmental conditions where relative humidity near 100% and temperatures were maintained at 22°C and examined regularly after emergence of seedlings for disease development. The seedlings which showed definite wilt signs including control were pulled and examined for disease symptoms.

White fan shaped mycelial growth with profusely branched, septate mycelia having clamps developed in the petri dishes within 5-7 days. Numerous small spherical brown

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sclerotia, about the size of mustard seed measuring 0.5-2.0 mm developed after 10-15 days incubation at 22°C. During development sclerotia were first white which turned tan to brown (Figure 1). The pathogen was identified as *Sclerotium rolfsii* on the basis of its cultural and morphological characteristics.

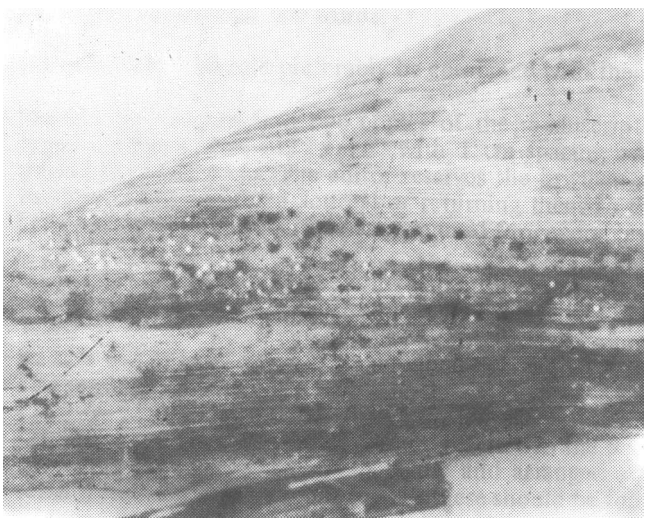

Figure 1. Sclerotia of *Sclerotium rolfsii* on maize ear husk

Pathogenicity

Within 15 days after maize seedlings emerged in pots containing infested soil with sclerotia of *S. rolfsii*, mycelial growth was noted on soil surface and around some of the seedling. In severely infected seedlings, soft watery rot symptoms and brown lesions which advanced upto 3 cm above the soil level appeared at the collar region. On the lesions, white mycelial growth having white and brown sclerotia depending upon the stage of maturity developed as observed in nature and seedlings were killed within 10-15 days. Roots of the infected seedlings were found rotted except control. The pathogen was reisolated from all the infected seedlings while no organism was isolated from the seedlings in uninfested control pots.

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