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STUDY ON INTENSITY OF SPREAD OF COLLAR –ROT DISEASE IN TUBEROSE

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ABSTRACT

Collar rot of tuberose caused by Sclerotium rolfsii causing heavy damage to the cropwas recorded in Odisah.The disease as characterised by the appearance of chlorotic rotting patches and white mycelia masses on the leaves, followed by drooping and drying..To study about this disease, with a chain of operations like planting material collection, isolation of pathogens, sterilisation of glassware, preparation of different media and inoculation in the media were conducted. The highest incidence /mortality of tuberose plants was observed when 12.5-15g. Of inoculums were used.Test conducted in vitro suggested that clayey soul was most favourable for stem rot infection in tuberose plant.Incidence of the disease ws very low in sandy soil indicating its unsuitability for sclerotium rolfsii to cause collar rot.

KEYWORDS: Intensity, Disease in Tuberose

INTRODUCTION

Tube rose is a native of Mexico. During 16th century, it spread to different parts of worlds. The name tube rose is derived from “tubrose”, this plant being the tubrose hyacinth as distinguished from the bulbous hyacinth. Sadhu and Bose (1973) have reported the existence of 4 cultivar viz. “Single”, “double, “semi-double and variegated”. The cultivar “single appears to be commercially, more promising than others.

Recently, commercial cultivation of tuberose has importance in Orissa for its uses as garlands, bouquets, cut-flowers and decorating marriage functions throughout the year. The area under tuberose is rapidly expanding by bringing new areas under cultivation around big cities and towns.

Like any other crops, tuberose also suffers from several diseases. Of these Collar-rot is one Gupta and Agrawal (1973).. The disease often known as stem rot, sclerotial-rot or sclerotial wilt. This destructive disease tuberose was for the first time described from West Bengal of India (Das,1961).

During the present investigation, symptoms of Collar-rot disease of tuberose was observed on leaves, collar region of stems and basal canopy of plants. The disease was characterised by the appearance of white coarse mycelia masses on the leaf surface causing rotting and detachment of such rotted leaves. Brown coloured roundish mustard like sclerotia were formed on the rotted leaves or around it. As a result of infection plants became weak and sent out few non flowering shoot in case of severe damage (Lal and Nagarjun,1983).. Das (1961) while describing the disease from Midnapore area of West Bengal reported similar symptoms.

Drooping, yellowing followed by drying of leaves was marked as typical symptoms of collar rot associated in tuberose. The fungus attacked roots and tuber and killed the plant in case of severe infection. These symptoms are also in

agreement with that of Dutta (1975).Water soaked lesions appeared on collar region of stem and flowering shots as a result invaded portion of stem rotted and frequent lodging of infected plant occurred in high humid weather if the soil was wet .This type of symptom associated in collar rot of tube rose in Bhubaneswar condition is for the first time was observed. Rotting of stem might have favoured due to high humid, warm temperature and wetness of the soil.

MATERIAL AND METHODS

The plant samples were collected from farmers field. Each sample was labelled properly and taken into laboratory for examination of incidence of collar rot caused by Sclerotium rolfsii.

ISOLATION OF PATHOGENS

With the moist blotter method recommended by ISIA(1953,1961), the diseased plant sample collected were washed and diseased collar parts were cut into pieces which were then washed and diseased collar parts were cut into pieces which were then disinfected with 1:1000 (0.1%) mercuric chloride solution. These were transferred to PDA slants after several washing in sterile water and incubated at 280C+-10C. The culture was maintained by sub-culturing to time PDA slants.

The pure culture was obtained by transferring a young immature white Sclerotium from culture tube to a fresh PDA slant and incubated for 9-10 days. From this culture a young white Sclerotium was again transferred to sterilised PDA slant. Thus a pure culture was obtained and maintained by sub culturing.

To study the effect of inoculums load of S.rolfsii on disease development plants were raised in 15 cm pots filled with sterilised soil. Five plants were transplanted in each pot. Ten days after establishment of the plants, the top portion of the soil was worked out and 15g of mycelia propagules maintain in Sorghum grain was mixed in top 2-3 cm soil and regulary irrigated with sterile water. Symptom development, disease incidence and mortality were recorded.

Soil Type

Various soil type such as loam, clay, clayey loam, sandy and laterite soil were collected from different parts of district. These soil were sterilised separately and filled in 15cm pots. These pots were inoculated with S. Rolfsii grown in sorghum grains soaked in 2% sucrose solution were spread on the soil. Percent of grain infection was counted at 5^{th},10^{th} and 15^{th} day after at five days interval.

RESULT AND DISCUSSIONS

Inoculum Load

Experiment conducted to determine the relation of amount of inoculums and collar – rot disease .It is evident from the table 1. that there was significant difference among inoculums load of S.rolfsii in inducing mortality in tube rose. The highest incidence of collar-rot (100%) was observed when122.5% - 15 g of inculum were used. Amount of inoculums viz. 15.00,12.5 g sclerotia are found significantly better than other treatment. It took only 9 days to kill a plant at 15g but the mortality was delayed up to 30 days at 2.5g. In general, a minor relationship was observed between the quantity of inoculums applied and collar-rot incidence. Disease expression was delayed with the reduction in the quantity of inoculums. The result is in conformity with those of findings of Pande et.al. (1994).

Soil types sometimes influences the incidence of soil-borne disease. Therefore, six soil types were artificially inoculated with S. Rolfsii to compare their ability in infecting sorghum grains fortified with 2% sucrose. From the table 2. It was cleared that clay soil encouraged highest infection of sorghum grains indicating its suitability for collar-rot incidence. Sand soil was found unfavourable to S. Rolfsii as compared to other soil type showing least infection of grains. Heavy incidence of collar rot in clayey soil may be attributed due to high water holding capacity nd nutrient availability suitable to S. Rolfsii. Earlier suitability of clayey loam and silty clay for S. Rolfsii causing stem rot in ground nut has been reported (Das et.al 1987).The lower incidence of grain infection by S. Rolfsii may be scribed due to quick depletion of soil moisture and poor source of energy. Thus heavy clay soil may be avoided for growing tube rose to escape from collar-rot infection. In general the infection was infection was maximum after 15th day of inoculation. Among the dates of observation a long gap of 15 days was found more condusive for maximum infection which was statistically significant to other day of observation.

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Table 1: Effect of Quantity of Inoculums (Sclerotia) of S.Rolfsii Inducing Mortality (%) in Tube Rose Plants

Inoculum Quantity(G)	Mortality	Days To Mortality (Days)
1.0	10.0(15.00)	0
2.5	23.3(28.77)	30
5.0	46.7(43.07)	30
7.5	76.7(61.22)	23
10.0	96.6(77.70)	16
12.5	100.0(90.00)	13
15.0	100.0(90.0)	9
Control	0	0
SE (m) +	(4.02)	
C.D.(0.05)	12.19	

Figures in parentheses are transformed angular values

Table 2: In Vitro Assessment of Soil Types on Infection of S.Rolfsii Enducing Collar Rot of Tuberose

Soil Type	Number of Sorghum Grain Media Infected
Sandy loam Soil	346.667
Loam Soil	367.778
Clayey Soil	391.111
Clay loam soil	372.56
Sandy Soil	320.667
Laterite Soil	352.222
SE (m)+	4.66
C.D.(0.05)	13.402
Time Period	
D1 -5th day	269.389
D2-10th day	377.500
D3-15th Day	428.611
SE (m)+	3.301
C.D.(0.05)	9.475
Soil x Time Period	
SE (m)+	8.807
C.D.(0.05)	23.213