Internat. J. Plant Sci. Vol.2 No.2 July 2007 : 104-107

Environmental factors influencing growth and development of *Ceratocystis paradoxa* – A causal organism of pineapple disease of sugarcane

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(Accepted :March, 2007)

SUMMARY
Of the several explanations enumerated for the low production of sugarcane, the disease onslaught is one of the chief constraints. Basic knowledge about the pathogen, its survival, spread and other related aspects are very important for better management of the disease. It is imminent to develop strategies involving different management practices including ecofriendly, environmentally safe ones. Hence a study to know the effect of Temperature, pH and relative humidity on *C. paradoxa* was takenup. In the present study of fungus grew well and sporulated in abundance in the temperature range of 25 – 28^{0}C. Sporulation intensity was highest at pH 7.0, in all the three media tested, i.e., SEA (27 x 10^6 spores/mL), PDA (64 x 10^6 spores/mL) and OMA (39 x 10^6 spores/mL) respectively. Lowest sett rot incidence was recorded at 60 per cent RH at all the intervals i.e., 34.99, 32.96, 28.93 and 25.98 per cent on 15th, 25th, 35th and 45th day after planting, respectively.

Key words :Sugarcane, Pineapple disease, *Ceratocystis paradoxa*.

Epidemiological studies are important to understand the nature of etiology, development and magnitude of inoculum, the perpetuation and dissemination of the pathogen. Such studies would help in designing suitable " Integrated Disease Management Practices". Basic knowledge about the pathogen, its survival, spread and other related aspects are very important for better management of the disease. The pineapple disease is a major cause for poor yields of sugarcane in the Northern Karnataka. Research involving growth attributes of the pathogen and the factors affecting thereof, need to be conducted. The results will go long way in strategising the methodology for the management of this endemic disease. Hence a study to know the effect of Temperature, pH and relative humidity on *C. paradoxa* was takenup.

MATERIALS AND METHODS

Experiment to assess the effect of temperature on growth and sporulation of *C. paradoxa* was conducted using three-growth media *viz*., Sugarcane Leaf Extract Agar (SEA), Potato Dextrose Agar (PDA) and Oat Meal Agar (OMA). Three litres of each medium was prepared in 1000 ml volumetric flasks. Hundred ml of each of the prepared medium was transferred to twenty four Erlenmeyer flasks (250 ml) separately after sterilization and allowed to cool. Pathogen from the pure mother culture was inoculated on to the media. The inoculated medium was incubated in temperature controlled incubator maintained at 5,10, 15,20, 28, 30 and 40°C for a period of 10 days. The intensity of fungal sporulation was quantified by massurating the five mm fungal disc in sterilized distilled water with a pestle and mortar. One drop of the above-prepared suspension was transferred onto haemocytometer and observed under compound microscope. The number of conidia for each 45 X microscopic field was enumerated using a hand held counter. Ten such observations were recorded for each of the replication. Average of ten observations was used deduce the intensity of sporulation for each replication of the medium in context. Spore per ml of suspension was calculated using the following formula.

Spores/ml = Spores observed from five blocks X 2000

Influence of pH on the growth and sporulation of fungal pathogen was assessed by growing the pathogen in three media *viz*., sugarcane leaf extract agar, PDA and OMA, as suggested by Kiryu (1939). However, before making up the volume after adding all the ingredients, the pH of the each of the three media was adjusted to 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5 and 9.0 using N/10 HCl and N/10 NaOH. The volume was later made upto mark using sterile distilled water.

Twenty ml of the prepared medium was thus transferred to sterile Petridishes. Inoculated Petriplates