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Effect of Light, pH and Calcium Chloride on Seed-Borne *Sarocladium oryzae* in Rice

C. GOPALAKRISHNAN

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SUMMARY

Adjusting the pH of water to 6.5 before incubating rice seeds in blotter test recorded maximum *S. oryzae* seed infection count in all the six seed samples tested. The maximum per cent *S. oryzae* seed infection count (48.67%) was observed in the case of variety ADTRH 1 followed by CORH 2 (39.67%) at pH 6.5. The blotters dipped in pH 8 revealed minimum seed infection count of *S.oryzae* irrespective of the seed samples tested as against pH 6.5. The results indicated that pH of water played an important role on the *S.oryzae* seed infection count. The maximum *S.oryzae* infection count was recorded when the seeds were exposed to 12 hrs NUV + 12 hrs darkness followed by 8 hrs NUV+ 16 hrs darkness in both the samples tested. ADTRH 1 recorded maximum *S.oryzae* (47%) at 12 hrs NUV + 12 hrs darkness followed by 8 hrs NUV + 16 hrs darkness (44.33%) on 8th day of incubation. In general, soaking the seeds in different concentrations of $CaCl_2$ increased *S. oryzae* seed infection count in all the rice seed samples tested. Among the different concentrations of $CaCl_2$ tested, soaking the seeds in 2 and 3 per cent concentration recorded more *S.oryzae* seed infection count than other concentrations tested.

Correspondence to :
C. GOPALAKRISHNAN
Department of Plant Pathology, Tamil Nadu Agricultural University, COIMBATORE (T.N.) INDIA

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Rice (*Oryza sativa* L.) seeds are known to harbour a wide range of both fungi and bacteria (Neergaard, 1977). A total of more than 100 fungi have been detected on rice seeds. About 20 species of fungal pathogens were detected from rice seed at any one time (Mew and Gonzales, 2002). Among them, sheath rot caused by *Sarocladium oryzae* is an important pathogen mainly affecting the economic part of the rice plant. The fungus is detected frequently during routine seed health testing.

Several methods have been evolved for detection of seed-borne microorganisms which have been reviewed from time to time (De Tempe, 1961, 1963, 1964; Agarwal, 1976; Neergaard, 1977; Agarwal and Sinclair, 1987; Gaur and Dev, 1988; Khare, 1996). The purpose of seeds health testing is to assure the safe movement of seed of different crops, for research or trade. It can also be a means of quality control to improve seeding stocks for crop production by farmers. Many detection methods have been developed over the years for various seed borne pathogens. Several criteria have to be considered in selecting a suitable routine seed health testing procedure. Primarily, it should be capable of revealing maximum pathogen infection and should also be versatile, revealing a range of pathogens (Singh *et al*., 1974).

The blotter and guaiacol agar methods were compared for the detection of *Helminthosporium oryzae* and *Trichoconis padwickii* in rice seeds. Guaiacol agar method appeared to be more sensitive than the Blotter method for the detection of *H. oryzae*, and less sensitive for the detection of *T. padwickii*. The Guaiacol agar method was much faster than the blotter method and did not require a microscope and black light equipped incubator (Kulik, 1975). Mathur (1979) recommended Potato dextrose agar for recording *T. padwickii* in rice seed lots. Paddy seeds were soaked in 0.2 per cent NaOH for 24 hours and incubated at 18 – 25° C. Little use has been made of serological methods for the detection of fungi, particularly in seed. Walez *et al*. (1985) showed that the enzyme-linked immunosorbent assay (ELISA) could be used to detect antigen of *Sclerotinia sclerotiorum* (Lib.) de Bary at a concentration as low as 10 ng $ml^{-1.}$ However, this fungus can be detected in seed samples by simple direct examination. Mia *et al*. (1985) found that standard blotter and deep freezing methods were equally effective in recording seed-borne infection of *Gerlachia oryzae*.

Shetty and Shetty (1988) developed Rice extract agar and its efficacy was compared with five other methods *viz*., standard blotter, 2,4- D, Deep-freezing blotter, Potato dextrose agar and Guaiacol agar. Rice extract agar was