The Andhra Agric. J 55 (1):119-121, 2008.

# Research Note

## Effect of Plant Products against Sheath Blight of Rice(*Oryza sativa* L.)

**Keywords :** Plant products, *Rhizoctonia solani* ,Sheath blight

Sheath blight of rice incited by *Rhizoctonia solani* is a potential threat to rice cultivation causing extensive damage to the rice crop (Naidu, 1992). The disease is known to appear in nursery and on transplanted rice. The pathogen is soil borne in nature which remains viable in soil for several months. Continuous and extensive cultivation demanding heavy application of chemical fertilizers have resulted in acidity and accumulation of toxic elements in fertile soils, thus creating an environment favourable for the development of certain soil borne diseases. The use of plant products (organic amendments) is one of the successful control methods of soil borne diseases . Controlling the disease by the use of plant products is one of the cheapest options and the fungitoxicity of the plant products on *Rhizoctonia solani* has been earlier reported (Kannaiyan and Prasad, 1981; Lakshmanan and Nair, 1984; Rajan and Reddy, 1986; Manibhushan Rao and Baby, 1991).

Pure culture of *Rhizoctonia solani* isolated from the infected paddy fields was maintained on PDA (Potato dextrose agar) in petri plates at (27 ± 1$^0$C). The antifungal activity of four plant products, *viz*, coconut cake, groundnut cake, neem cake and sesame cake was tested against *Rhizoctonia solani* by poisoned food technique. The four plant products were prepared at 1,2,3,4 and 5 per cent concentrations. Each of the finely powdered oil cakes was added to the PDA medium @ 1 per cent before sterilization. The agar plates containing the plant products were inoculated aseptically with *Rhizoctonia solani* by transferring a small mycelial disc of 5 mm size with help of a sterilized cork borer from 3 - day old culture at the center of agar medium in the petridish. The inoculated media were incubated at room temperature (28 ± 1$^0$C), until the fungal growth in control plate was maximum. Four replications were maintained for each plant product. The growth of the fungus in respect of different plant products was estimated by measuring the diameter of the colony and per cent inhibition of growth was estimated by using the formula given below. Agar plate without any plant product served as control.

In the present study significant reduction in growth of *Rhizoctonia solani* was observed in respect of all the plant products tested. The results indicated (Table 1) that among the four plant products coconut cake and neem cake were found to be most effective as compared to groundnut cake and sesame cake as they have inhibited the growth of the pathogen to a greater extent. There was an increase in the effect of plant product against the growth of the fungus with the increase in the concentration of plant product used. Among the four plant products coconut cake at 5 per cent level showed 78.13 per cent inhibition of fungal growth followed by neem cake (77.69 per cent), groundnut cake (11.47 per cent), and sesame cake (0.00 per cent). The findings of the present study are in agreement with Kannaiyan and Prasad (1981), Lakshmanan and Nair (1984) and Manibhushan Rao and Baby (1991).

$$\% \text{ inhibition of the organism over control} = \frac{\left[\text{Area of the fungal colony in control plate}\right] - \left[\text{Area of the fungal colony in treated plate}\right]}{\text{Area of the fungal colony in control plate}} \times 100$$

Table 1. Effect of plant products against growth of *Rhizoctonia solani* by Poisoned food technique *in vitro*.

| S.No. | Plant products | Concentrations of plant products | | | | | | | | | | | | | | | Mean | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1% | | | 2% | | | 3% | | | 4% | | | 5% | | | | |
| | | A* | B | C | A* | B | C | A* | B | C | A* | B | C | A* | B | C | A | C |
| 1 | Coconut cake | 5.52 | 23.74 | 28.03 (49.61) | 5.44 | 23.05 | 59.25 (50.03) | 5.36 | 22.37 | 60.45 (51.03) | 4.30 | 14.33 | 74.66 (59.77) | 4.00 | 12.37 | 78.13 (62.12) | 4.92 | 66 |
| 2 | Ground nut cake | 8.48 | 56.30 | 0.47 (3.93) | 8.48 | 56.30 | 0.47 (3.93) | 8.48 | 56.30 | 0.47 (3.93) | 8.40 | 55.24 | 2.35 (8.81) | 8.00 | 50.08 | 11.17 (19.79) | 8.36 | 10 |
| 3 | Neem cake | 7.12 | 39.63 | 29.94 (33.17) | 5.52 | 23.74 | 58.03 (49.61) | 5.24 | 21.37 | 62.22 (52.07) | 4.56 | 16.14 | 71.46 (57.70) | 4.04 | 12.62 | 77.69 (61.81) | 5.29 | 3.04 |
| 4 | Sesame cake | 8.50 | 56.57 | 0.00 (0.00) | 8.50 | 56.57 | 0.00 (0.00) | 8.50 | 56.57 | 0.00 (0.00) | 8.50 | 56.57 | 0.00 (0.00) | 8.50 | 56.57 | 0.00 (0.00) | 8.50 | 59.86 |
| 5 | Control | 8.50 | 56.57 | 0.00 (0.00) | 8.50 | 56.57 | 0.00 (0.00) | 8.50 | 56.57 | 0.00 (0.00) | 8.50 | 56.57 | 0.00 (0.00) | 8.50 | 56.57 | 0.00 (0.00) | 8.50 | 0.00 |
| | Mean | 7.62 | | | 7.28 | | | 7.21 | | | 6.85 | | | 6.60 | | | | 0.00 |

| | SEm± | C.D(P = 0.05) |
|---|---|---|
| Plant products | 0.0156 | 0.0306 |
| Concentrations | 0.0175 | 0.0342 |
| Plant products x concentration | 0.0349 | 0.0684 |

** Figures in parentheses are angular transformed values

* A = Colony diameter (cm)
B = Area of fungal colony (sq. cm)
C = % inhibition over control

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(Received on 19.02.2007 and revised on 09.05.2007)