

## Effect of Compost Tea and Plant Extracts on Sheath Blight and Blast Diseases of Rice (*Oryza Sativa*)

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### Introduction

Blast caused by *Magnaporthe oryzae* and sheath blight caused by *Rhizoctonia solani* are destructive rice (*Oryza sativa*) diseases which reduce both grain yield and quality worldwide (Ou, 1985). The widespread adoption of synthetic fungicides to control diseases has shadowed by the health risks associated with applying or consuming the materials (Cookl and Baker, 1983). Compost tea is a type of biological control that has potential to suppress a broad range of plant pathogens (Scheuerell and Mahaffee, 2002) and several higher plants have proved their usefulness against a number of fungi (Dixitet et al., 1983; Singh et al., 1983). Therefore this study was carried out to evaluate the fungicidal effect of Compost tea and some plant extracts on Sheath Blight and Blast diseases of rice.

### Methodology

*M. oryzae* infected rice leaves and *R. solani* infected rice sheaths were collected from the fields to isolate the disease causing pathogens at the Pathology Laboratory, Rice Research and Development Institute (RRDI), Batalagoda. Isolated fungal colonies on the PDA media were used to examine microscopic characteristics for identification of organism and Koch's postulate was confirmed. Hundred grams of *Croton laccifer*, *Gliricidia sepium*, *Ardathoda vasica* leaves and *Azaadirachta indica* seeds were surface sterilized and grinded using pestle and mortar. The extracts were diluted by adding 1 L of distilled water to each beaker. After 12hrs extracts were strain through Whatman paper No. 1 filter papers and used as treatments. Bucked bubbler method was used to prepare compost tea (Sustainable Agriculture Technologies. Inc.2008). Fungicide (Tebuconazol) was prepared according to label instructions (0.6ml L<sup>-1</sup>). Pure culture of the fungus was placed at the center of each Petri dish with PDA media. Two filter paper discs were impregnated with each treatment (plant extracts, compost tea, fungicide and distilled water) were placed on the opposite sides to each other. Inhibition zones were examined using a 1cm<sup>2</sup> grid at intervals of 24hrs till the plates were filled with mycelia in either treatment. A pot experiment was carried out between June-September, 2013 at RRDI; Batalagoda.

The treatments were arranged in Complete Randomized Design with three replicates. Seeds of rice variety Bg 352 were used. Compost tea and plant extracts were applied every 2 week interval after transplanting. *R. solani* inoculums were placed at the base of the tillers 10 weeks after transplanting. Chemical fungicide was applied according to the label recommendations once the symptoms appear. Relative lesion height, scale of disease severity (IRRI 1996) and the per cent disease index (McKinney 1923) was calculated in every week after inoculation. Data analyses were conducted using MINITAB 16 statistical software.

### Results and Discussion

Microscopic observations show that the dimensions of mycelia are agreed with original description of *M. oryzae* and *R. solani* (Supriya and Sharma, 2010, Ou, 1985).

As shown in figure 1 after 120 hours the Petri plates which contained control were fully covered by mycelia of *M. oryzae*. All the other treatments recorded zone of inhibitions significantly

higher than the control. Highest zone of inhibition was obtained from fungicide and second highest was recorded from compost tea followed by *A. indica* seed extract.

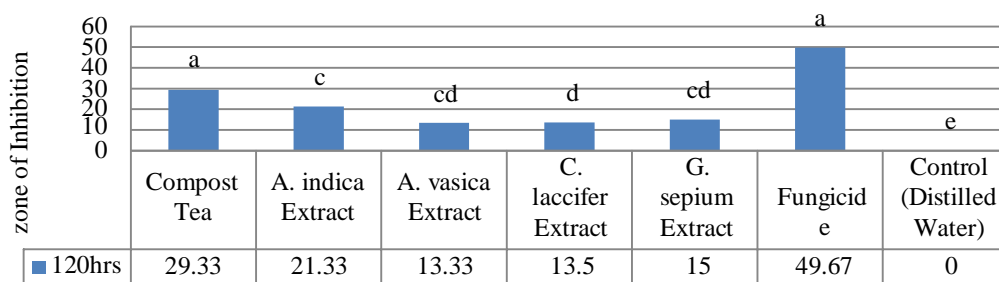


Figure 1. Resistance of *M. oryzae* to treatments, as measured by mean zones of inhibition. Bars with common letters do not differ significantly at P=0.05.

Highest *R. solani* mycelia inhibition was recorded by fungicide and all the other treatments were showed significantly higher zones of inhibition over the control after 72 hours (Figure 2).

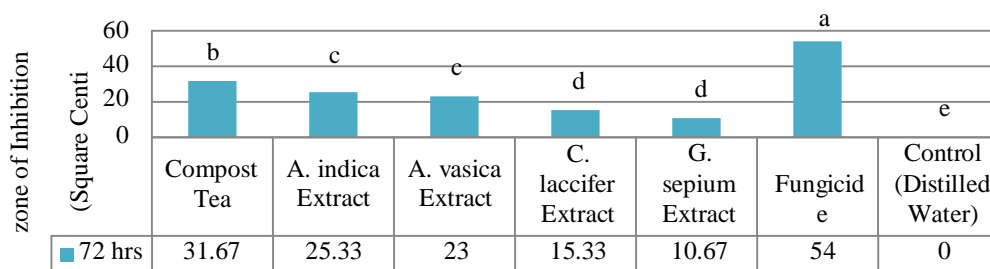


Figure 2. Mean zones of inhibition after 72 hours. Bars with common letters do not differ significantly at P=0.05.

According to the Figure 3 an increasing average relative lesion height (RLH) was recorded with the days of data collection at 1 week, 2 week, 3 week and 4 week after inoculation, *A. vasica* leaf extract, compost tea and *A. indica* seed extract shows the lowest RLH 1 week after inoculation. In all the treatments RLH was lower than control and it may be due to a resistance developed in the plants against the sheath blight fungous mycelia growth due to the treatment application. At four weeks after inoculation fungicide, *A. vasica* leaf extract and *A. indica* seed extract showed the lowest RLH while the *G. sepium* leaf extract and control received plants showed the highest RLH.

Disease index was less in plants sprayed with all the other treatments as compared to the control plants. Plants sprayed with fungicide (36.29), *A. vasica* leaves (48.15), compost tea (49.63) and *A. indica* seed extracts (51.15) possessed less disease symptoms as compared to the *C. laccifer* (54.074), *G. sepium* (55.56) and distilled water (73.33) sprayed plants.

Four weeks after inoculation highest disease scale was shown by the control (7) while lowest was recorded in fungicide (3).

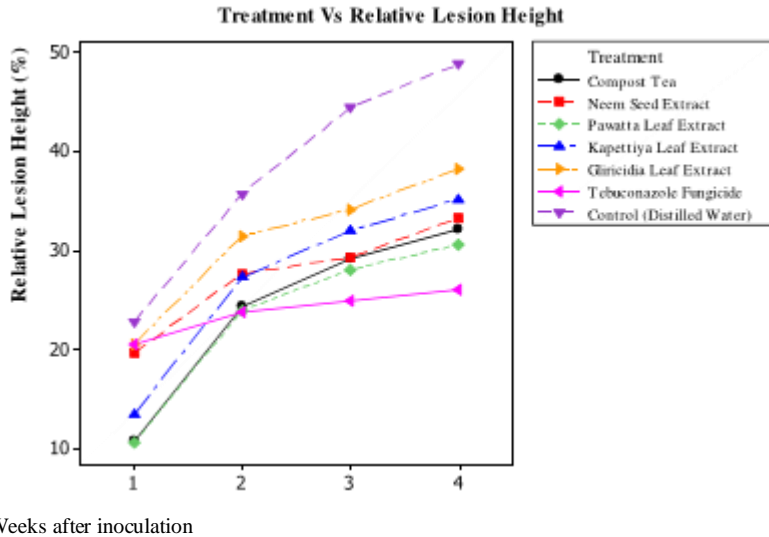


Figure 3. Relative lesion height of the rice plants treated with different treatments at different weeks after inoculation.

### Conclusions

In rice cultivation application of compost tea, extracts of *C. laccifer*, *G. sepium*, *A. vasica* leaves and *A. indica* seed extract can reduce the mycelia growth of *M. oryzae* and *R. solani*. Although they are not effective as fungicide (Tebuconazol) compost tea, *A. vasica* leaves and *A. indica* seed extracts can be used in rice cultivation to reduce blast and sheath blight diseases.

### References

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