EFFICACY OF BIOAGENTS AGAINST SEED BORNE FUNGI OF RICE

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ABSTRACT: The effect of different antagonist viz. Trichoderma viride Pseudomonas fluorescens and Bacillus subtilis were evaluated against different seed borne fungi of rice by dual culture technique. Among three bio agents Trichoderma viride (42.59 to 73.33%) followed by Bacillus subtilis and Pseudomonas fluorescens over control. Significant suppression of radial mycelial growth of Drechslera oryzae by Trichoderma viride, and Trichoderma harzianum in dual culture and Inhibition of Curvularia lunata causing black kernel in rice with Bacillus subtilis (97.77%) followed by Trichoderma viride (96.44%) and Trichoderma harzianum (93.50%) in dual culture method.

Key words : Rice, seed borne pathogen, bio agents in vitro.

INTRODUCTION

Rice/Paddy (Oryza sativa) is the most perfect staple food crop of world. seeds are carrier of fungal either externally or internally or both. The variety and intensity of fungal flora changes area wise and depend upon climate under which seed produced storage component of seed. Several fungi have been reported by any workers in Rice. Some of the widely distributed rice diseases are brown spot caused by Bipolaris oryzae, blast (Pyricularia oryzae), bakane disease (Fusarium moniliforme), narrow brown leaf spot (Cercospora oryzae), stack burn (Alternaria padwickii), leaf Scald (Macrodochium oryzae), sheath blight (Sorocladium oryzae), false smut (Ustilaginoidea virens), kernel smut (Nigrospora oryzae), udabatta disease (Ephelis oryzae), scab (Fusarium graminearum), bunt of rice (Tilletia barclayana) and Leaf smut (Entyloma oryzae). Discolouration caused by several fungal species among them Curvularia lunata is the most important one and responsible for both qualitative and quantitative loss Sumangala et al. (2008). Sheath blight of rice is caused by Rhizoctonia solani kuhn is a serious threat in rice growing areas Janki Kanndhari (2007). Foot rot and bakanae disease caused by Fusarium moniliforme has become destructive disease of paddy in different part of the country (Dodan et al.1994). Rice blast incited by Pyricularia oryzae Cav is one of the most serious disease inflicting heavy losses (Gohel et al 2008).

MATERIAL AND METHODS

Seed samples of rice cultivar PKV Makar and, PKV Ganesh, PKV HMT, SKL-6 and SKL-8 were collected from Rice Research Station, Sindhewahi. and Ratna was collected from Konkan region and bioagents Trichoderma viride 4g/kg of seeds, Pseudomonas fluorescens 10g/kg of seeds, Bacillus subtilis 10g/kg of seeds were tested against seed borne fungi of rice.

Efficacy of Bio Agent against Seed Borne Fungi by Dual Culture Technique.

Lawn culture of test fungi and bioagents i.e. Trichoderma viride were prepared on PDA medium. Bacterial Bioagents P. fluorescentes and B. subtilis were prepared by inoculating a loopful culture in sterilized conical flask containing hundred ml nutrient broths. Broth culture was incubated at room temperature for three days. Autoclaved PDA poured in sterilized petriplates and allowed to solidify. Four petriplates each bio agents were used. Six mm disc of seven days old test fungus and bio agent were cut with the help of cork borer lifted and transferred in petriplates. Four discs of bio agents were inoculated at four peripheral points of the plates and test. Fungi were placed in centre of petriplates. Three days old culture of P. fluorescentes and B. Subtilis streaked around the disc of test fungus of two sites. Control plates were kept where; culture disc of test fungus was grown in same condition on potato dextrose agar without bio agents. The plates were incubated at room temperature for seven days. After an expiry of incubation period the mycelial inhibition was calculated.
RESULT AND DISCUSSION

Table -1 indicates that the maximum growth inhibition of seed borne fungi of rice were observed in *Trichoderma viride* (42.59 to 73.33%) followed by *Bacillus subtilis* and *Psuedomonas fluorescens* over control. Significant suppression of radial mycelial growth of *Drechslera oryzae* by *Trichoderma viride*, and *Trichoderma harzianum* in dual culture method reported by Kumawat et al. (2010). Reduction in sheath blight due to *Bacillus* spp. and *Fluorecent pseudomonas* in rice have been reported by many earlier workers. Laha and Venkantaraman (2001), Muralidharan et al. (2004) and Rajbir and Sinha (2004) reported Inhibition of *Curvularia lunata* causing black kernel in rice with *Bacillus subtilis* (97.77%) followed by *Trichoderma viride* (96.44%) and *Trichoderma harzianum* (93.50%) were reported by Sumangala (2008) and similar kind of observations were recorded in present investigations.

<table>
<thead>
<tr>
<th>Bio agents</th>
<th>Dose g/kg seed</th>
<th><strong>C. lunata</strong> MCD (mm)</th>
<th>PGI</th>
<th><strong>B. oryzae</strong> MCD (mm)</th>
<th>PGI</th>
<th><strong>M. roridum</strong> MCD (mm)</th>
<th>PGI</th>
<th><strong>A. strictum</strong> MCD (mm)</th>
<th>PGI</th>
<th><strong>F. moniliforme</strong> MCD (mm)</th>
<th>PGI</th>
<th><strong>D. oryzae</strong> MCD (mm)</th>
<th>PGI</th>
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</thead>
<tbody>
<tr>
<td><em>T. viride</em></td>
<td>4.00</td>
<td>32.00</td>
<td>64.4</td>
<td>4</td>
<td>73.3</td>
<td>31.0</td>
<td>0</td>
<td>42.5</td>
<td>9</td>
<td>35.0</td>
<td>0</td>
<td>52.0</td>
<td>94</td>
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<tr>
<td><em>B. subtilis</em></td>
<td>10.00</td>
<td>51.00</td>
<td>43.3</td>
<td>0</td>
<td>69.0</td>
<td>51.0</td>
<td>0</td>
<td>5.5</td>
<td>5</td>
<td>31.0</td>
<td>0</td>
<td>38.0</td>
<td>37</td>
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<tr>
<td><em>P. fluorescens</em></td>
<td>10.00</td>
<td>51.00</td>
<td>43.3</td>
<td>3</td>
<td>74.0</td>
<td>52.0</td>
<td>3.7</td>
<td>34.0</td>
<td>0</td>
<td>33.3</td>
<td>33</td>
<td>45.0</td>
<td>2.1</td>
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<tr>
<td>Control</td>
<td>-</td>
<td>90.00</td>
<td>0</td>
<td>0</td>
<td>90.0</td>
<td>0</td>
<td>0</td>
<td>54.0</td>
<td>0</td>
<td>51.0</td>
<td>0</td>
<td>46.00</td>
<td>0</td>
</tr>
<tr>
<td><em>F test</em></td>
<td>-</td>
<td>sig</td>
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<tr>
<td>SE(m)±</td>
<td>-</td>
<td>0.47</td>
<td>0.34</td>
<td>-</td>
<td>0.55</td>
<td>-</td>
<td>0.53</td>
<td>-</td>
<td>0.57</td>
<td>-</td>
<td>0.38</td>
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<td>CD(P=0.01)</td>
<td>-</td>
<td>2.40</td>
<td>1.74</td>
<td>-</td>
<td>2.18</td>
<td>-</td>
<td>2.61</td>
<td>-</td>
<td>2.89</td>
<td>-</td>
<td>1.91</td>
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</table>

MCD = Mean Colony Diameter  PGI = Per cent Growth Inhibition

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REFERENCES


