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Control of sheath blight and other diseases in rice cropping systems using plant extracts

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Project objectives

1. Screening for plant extracts which can reduce infection of primarily R. solani
2. Elucidating the exact mechanisms behind the disease reduction

Work plan

1. Development of a screening system for plant extracts against R. solani
2. Basic studies of R. solani infection biology (histopathology) using microscopy
3. Studies of defence responses in plants with and without application of the selected plant extracts to verify whether induced resistance is involved in the disease reduction
   3.1. Test for direct antimicrobial effects of the selected plant extracts on the pathogen
   3.2. Studies of known induced resistance markers, e.g., H2O2, callose, lignin and lignin precursors using microscopy and specific staining techniques
   3.3. Studies of activities of the important defence-related enzymes such as chitinase, glucanase, etc.
   3.4. Gene expression studies using commercial Affymetrix GeneChips® and qRT-PCR to identify which genes are important in defence associated with induced resistance
4. Test of the selected plant extracts against other important rice pathogens including blast (P. grisea) and bacterial blight (Xanthomonas oryzae pv. oryzae) under greenhouse conditions
5. Evaluation of effectiveness of the selected plant extracts under field conditions

References


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