

Environmental and Social Safeguards Management in NAIP

Project title: Allele Mining and Expression Profiling of Resistance- and Avirulence-genes in Rice-Blast Pathosystem for Development of Race Non-Specific Disease Resistance

1. Basic information

A. Project Data

Project statistic

Total cost: Rs. 609.0496 lakh

Duration: Four years three months

Location: New Delhi, Palampur, Hazaribag and Dharwad

- **Consortium Leader** : NRCPB, IARI, Pusa, New Delhi
- **Consortium Partners:** IARI, New Delhi
 - : Central Rainfed Upland Rice Research Station
 - : CRRI, Hazaribag, Jharkhand
 - : UAS, Dharwad
 - : CSHPKV, Palampur, HP
- **Consortium PI:** Dr. T. R. Sharma
- **Consortium CoPI:** Dr. A. K. Singh
 - : Dr. Mukund Variar
 - : Dr. S. K. Prashanthi
 - : Dr. Rajeev Rathour

Project Objectives

- Mining alleles of important blast resistance genes from rice and *Avr* genes from *Magnaporthe grisea*
- Generation of race non-specific disease resistance using rice blast resistance gene *Pi-k^h* and *AVR:Pi-k^h* gene from *M. grisea*
- Expression profiling of near isogenic lines containing blast resistance genes to understand basic mechanism involved in disease resistance.

Brief Project Description

The proposed project is on the isolation of genes and promoters for blast resistance, which is a very devastating disease of rice. Every year it takes a heavy toll of crop in different parts of India. Farmers usually go for fungicidal applications which is a very expensive and environmentally unsafe proposition. We intend to develop blast resistance rice cultivars in a period of 4 years and 3 months which will go a long way in helping resource poor farmers of the country.

B. Environmental Category

2. Major issues in the subproject

- Social : Not an issue
- Environmental: Not an issue
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3. Safeguard Policies Triggered (World Bank Policies)

Safeguard Policies Triggered (World Bank Policies)		
	Yes	No
Environmental Assessment (OP/BP 4.01)	[]	[X]
Natural Habitats (OP/BP 4.04)	[]	[X]
Pest Management (OP 4.09)	[]	[X]
Cultural Property (draft OP 4.11-OPN 11.03 -)	[]	[X]
Involuntary Resettlement (OP/BP 4.12)	[]	[X]
Indigenous Peoples (OD 4.20)	[]	[X]
Forests (OP/BP 4.36)	[]	[X]
Safety of Dams (OP/BP 4.37)	[]	[X]
Projects in Disputed Areas (OP/BP 7.60)	[]	[X]
Projects on International Waterways (OP/BP 7.50)	[]	[X]

4. Risk related Issues (not covered under 3 above but perceived to be important in the sub project): **No risk**

5. Impact Assessment (Enclosure –I and II)

Enclosure-I

A: Environmental Safeguard : Activities, Issues, Impact and Mitigation Measures

Table 1: Environmental Safeguard : Activities, Issues, Impact and mitigation Measures

Activities ¹	Issues ²	Anticipated level of Impacts ³		Mitigation Measures (Negative Impact) ⁴
		Positive	Negative	
Allele mining of R- and AVR-genes	Nil	It will help in finding new alleles for rice blast resistance which can be used for developing disease resistance cultivars	Nil	Nil
Expression profiling of monogenic rice lines	Nil	It will give an insight in the study of co- regulator genes which expresses in host-pathogen interactions	Nil	Nil

Enclosure-II

B. Social Safeguard: Activities, Issues, Impact and mitigation Measures

Table 2 : Social Safeguard : Activities,Issues, Impact and mitigation Measures

Activities ¹	Issues ²	Anticipated level of Impacts ³	Mitigation Measures (Negative Impact) ⁴

		Positive	Negative	
Finding new alleles for blast resistance and developing monogenic rice lines	Nil	The study will provided unique breeding material for the use of rice breeders and geneticists.	Nil	Nil

6. Potential indirect and / or long-term Impacts due to anticipated future activities in the project areas (assessment of anticipated conflict / complementarity with the current as well as those proposed for the next five years) in the areas of activities of the sub-Project):

- PCR based Allele mining for selected blast resistance genes from land races of rice and *Avr* genes from different pathotypes of *M. grisea* and identification of SNPs and functional alleles will be useful to the rice breeders and geneticists for developing improved rice cultivars
- Use of bioinformatics approaches for the analysis of whole *M. grisea* genome to identify *Avr* genes, these alleles can be used by the pathologists to monitor genetic variability in pathogen populations.

7. Identify the key stakeholders and describe mechanisms for consultation

The primary stakeholders for this sub-project are rice breeders, geneticists and plant pathologists of the NARS, India. The secondary stakeholder would be farming community of the country, which will be the ultimate target by the rice breeders and geneticists. These stakeholders will be consulted during the project workshops.

8. Consultation / disclosures to be done in future :

The sub-project shall be initiated with the launch workshop at NRCPB, New Delhi. A training workshop on allele mining for the Scientists from NARS will also be organized by the NRCPB. Annual workshops shall be organized to review the progress as per milestones of the project. The outcome of the project will be shared among the scientific community by publishing research papers in the international and national journals, writing popular articles and bulletins etc.

Consortium PI

National Coordinator

National Director