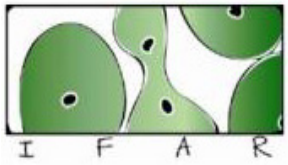

IFAR 2007 Professional Development Program
Completion Report

[800 words]

Instructions:

Please submit the completion report by email, using this form, through the sponsoring CGIAR Center to ifar@ifar4dev.org within three months after the completion of the fellowship.

Please check if Thalwitz Scholarship

Name of Applicant: **Dr. Md. Enamul Hoque**

Sponsoring CGIAR Center: **International Rice Research Institute (IRRI)**

I. Work Program goals achieved (maximum length: 200 words)

The project has enabled to start work on gene pyramiding for bacterial blight (BB) and blast in the background of two Bangladeshi mega rice varieties (BRRI dhan28 and BRRI dhan29). Following the plan, crosses were made at Bangladesh Rice Research Institute (BRRI), Bangladesh to generate F_1 seeds which were then brought to IRRI for molecular studies. Although project was initially targeted for pyramiding two BB resistance (x*a13* and *Xa21*) genes, there is opportunity in the crossing program to introgress four BB resistance genes (*Xa4, xa5, xa13* and *Xa21*) from the donor IRBB60. After genotyping, it was shown for the first time that both recipient cultivars are already carrying *Xa4* gene. However, lines carrying x*a5* gene were not identified among the progenies. Based on genotyping analysis plants that have at least three BB genes (*Xa4, xa13* and *Xa21*) were selected (Table 1). Two molecular markers linked to the *Pik* and *Pi1*genes were used for blast resistance. But marker linked to *Pi1* gene was not efficient enough in the present study. Therefore, an effort has already been taken at IRRI for further improvement/development of the marker for the above gene for future study.

Table 1: List of plants selected after genotyping

Sl. No.	Crosses	Number of F_1 plants screened	Number of F_1 plant selected	Selected plants contained resistance gene (s)
1	BRRI dhan29 × IRBB60	165	79	*Xa4*, *xa13* and *Xa21*
2	BRRI dhan28 × IRBB60	80	38	*Xa4*, *xa13* and *Xa21*
3	BRRI dhan29 × IRBL1-CL	92	52	*Pi1*
4	BRRI dhan29 × IRBLK-KA	95	52	*Pik*
5	BRRI dhan28 × IRBL1-CL	76	7	*Pi1*
6	BRRI dhan28 × IRBLK-KA	45	17	*Pik*

II. Plans for follow-up (maximum length: 200 words)

During the present study, some plants (F_1s) were generated in the background of two Bangladeshi mega rice varieties (BRRI dhan28 and BRRI dhan29) which have the desired genes (bacterial blight/blast resistance gene) through Marker Assisted Selection (MAS). These F_1s will be further backcrossed until selected plants are advanced to BC4 generation. The backcross progenies will be established using recurrent parents at each cycle and will be screened for the desired genes. Molecular markers will be used in each backcross to select resistant plants. The selected plants will be used in crosses at each season. After reaching toward homozygosis, elite lines in the background of BRRI dhan28 and BRRI dhan29 with genes pyramided for bacterial blight and blast resistance will be evaluated under field and screen-house conditions for stability of resistance towards release as a variety.

III. Report budget utilization including whether budget was spent as planned (maximum length: 100 words)

The funds arrived late. However, most of the budget was used as planned. Some of the budget money (370 US dollar) allocated for contingency was used towards my international visit at IRRI for doing molecular work and the rest of the contingency budget was used at my native institution (BRRI) in Bangladesh. Also some of the budget money allocated (500 US dollar) for personal/services was used at IRRI and the rest of the money was used at BRRI.

IV. Assessment of the fellowship experience and general comments.

(maximum length: 300 words)

The IFAR small grant fellowship provided me a great opportunity to initiate a collaborative project at Bangladesh Rice Research Institute (BRRI), Bangladesh with International Rice Research Institute (IRRI), a leading CGIAR center for rice research. Through this fellowship, I had been given a chance to conduct hands-on experience in marker-aided breeding in rice. Moreover, I gained new ideas and knowledge especially on molecular breeding from the scientists of the sponsoring center which substantially strengthen my scientific skill. The joint project has also strengthened linkages between IRRI and BRRI for future work on rice varietal development program. The main factors that influenced these achievements are the adequate budget to undertake this study and the international collaboration. Timely release of fund is one of the important factors to the success of a project, but the weak point of this project was the late disbursement of funds. Moreover, although the budget is adequate for one full year, but much less time was given for spending the fund. The allocation of found through this grant only provided cost for one year, irrespective of the project duration. But I think for the longer-targeted project like mine, some fund should be allocated for subsequent years to visit the concern CGIAR center for interaction meeting on different issues of the ongoing project with the concern CGAIR scientists.