Entry No. IRRC-0053

Category	: International Rice Research Conference
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Title of Entry	: Study on parasexual recombination between rice blast fungus (Pyricularia oryzae) and crabgrass blast fungus (Pyricularia grisea)
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Abstract	: Rice blast fungus (Pyricularia oryzae) is notorious for rapidly changing its genetic make-up resulting in new pathogenic variants (Dean et al. 2012). It was pointed out in several previous findings that the genetic variations in rice blast fungus were induced by parasexual recombination following hyphal anastomosis (Noguchi et al 2006). Mehrabi et al. (2011) proposed that another possible source of genetic variability in imperfect fungi is parasexual recombination followed by vegetative hyphal fusion, which allows horizontal gene or chromosome transfer among different isolates. So it can be postulated that such an imperfect fungus has another mechanism for generating genetic variations. In Japanese rice blast fungal population, parasexual recombination is possibly the only mechanism of genetic recombination between isolates as ascospore production from any cross between field isolates has not been reported to date. Recent studies concerning comparative genomics reveal that parasexual recombination may play important role in the evolution of rice blast fungus. To observe the parasexualism of rice blast (Pyricularia oryzae) and crabgrass blast (Pyricularia grisea) fungus double inoculation and punch method were applied in this experiment. A total of 520 isolates collected from the double inoculated lesions were subjected to PCR-RFLP analysis of the ITS region to identify subcultures of the inoculated rice blast isolates. As a result, four isolates from the three double inoculated lesions with SA13-1ME and TP106 were identified as subcultures of TP106. To access the recombination genotypes, a total of 17 isolates from the three lesions was subjected to MAGGY-DNA fingerprint analysis. However, recombinant DNA fingerprint patterns between TP106 and SA13-1ME were not detected among the 17 isolates. Although, TP022 was not recovered from the double inoculated lesions. From this study we can conclude that TP106 was recovered from the double inoculated lesion indicates that rice blast fungus can invade and colonized in blast lesion on crabgrass. The opportunistic infection on the double inoculated lesions observed in this study potentially provides new insight into the life cycle of rice blast pathogen. Read Less

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