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Commentary

Prevalence of Rice Blast Disease in Various Countries

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DESCRIPTION

Rice blast disease worldwide attempts are being made to study the host pathogen interactions using *Magnaporthe grisea*, the causal agent of rice blast disease. Rice is one of the major nutritional sources, being the primary or secondary staple for more than half the population of the world. Rice is grown in around 89 countries and more than 3 billion people derive their one fifth calorific intakes from rice consumption. In 2030, global demand is projected to be approximately 533 million tons of rice, compared to 472 million tons projected for 2015, and an average of 386 million tons consumed in 1997 to 1999. There are over 80 reported rice diseases and some of them have been shown to be a major limitation to rice yield in different rice ecosystems. Rice blast is perhaps the most widely distributed plant disease, as it occurs in 85 countries worldwide and causes 70%-80% of crop loss during an epidemic season. Blast was first reported in Asia more than three centuries ago and is now present in over 85 countries. It was probably first recorded as rice fever disease in China in 1637 and was later described as imochi-byo in Japan in 1704, and as brusone in Italy in 1828. During 2003, in India, rice blast was responsible for losses of more than 2,66,000 tons of rice, which was about 0.8% of the total yield. In Japan, the disease affects approximately 8,65,000 hectares of rice fields each year. In the Philippines, rice fields may suffer more than 50% yield losses each year caused by rice blast. *M. grisea* infects more than 50 types of grasses, including economically important crops like barley, wheat, rice, and millet, but individual field isolates are limited to infect one or few host species. *M grisea* produces spots or lesions on leaves (leaf blast), nodes (node blast), neck of panicle (neck rot) or other parts of the panicles (panicle blast). The lesions are elliptical with more or less pointed ends. The center of the lesions is usually grey or whitish with a brown margin. The shape and the color of the lesion depend on the environmental conditions, age of lesion and the degree of susceptibility. The lesions on the neck can result in complete loss of crop. Some blast infected rice plants. *M. grisea* is highly adaptable to environmental conditions and can be found in irrigated lowland, rain-fed upland, or deep water rice fields.

CONCLUSION

In spite of great deal of research into the pathogen and the disease, blast still remains to be a serious constraint in rice production in all irrigated and upland environments. Control strategies like the use of resistant cultivars and application of fungicides have not allowed complete eradication of the disease. The fungus has been able to develop resistance to both chemical treatments and genetically resistant rice cultivars developed by plant breeders. As such, a detailed understanding of the infection mechanism may help in the development of new strategies to control this disease. Rice blast fungus helps to study plant pathogen interaction Filamentous fungi represent a diverse and economically important class of organisms that includes pathogens of humans, animals, and crop plants as well as industrially important organisms. *M. grisea* is a haploid filamentous ascomycete and has become an excellent model organism for studying fungal phytopathogenicity and host-pathogen interactions. *M. grisea* can be cultured on defined media and various genomic and cDNA libraries are available and genetic maps of the fungus have been developed.

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