주제발표 초록

1. Current Researches on Enhancing Rice Blast Resistance in Korea

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Rice blast, caused by *Magnaporthe grisea*, is one of the most economically important diseases of rice in various ecosystems such as in upland, lowland fields and irrigated ecosystems in temperate regions. Since use of the host resistance has been regarded as the most efficient way to control the disease, researches on the pathogen variability, host resistance and the rice-blast interaction have been the most important topics in both plant pathology and resistance breeding. *M. grisea* populations exhibit high pathogenic variability, which enables blast to overcome host resistance in a relatively short time. The best example of breakdown of resistance to blast in rice was occurred during late 1970s in Korea.

So far more than 35 major resistance genes to blast were identified worldwide and some of them have been designated as a serial number as *Pi-1, Pi-2 etc.* Resistance spectrum of the resistance genes to the *M. grisea* population in different countries have been studied intensively to develop international blast differential system as well as to select genes for practical use in rice breeding program. Such a resistance genes as *Pi-9, Pi-2, Pi-33, Pi-3* and *Pi-5* were reported as a broad spectrum resistance or durable resistance genes.

The current blast differential systems in Korea was developed 20 years ago and their genetic background was quite different from that of major commercial cultivars these days. Therefore, interaction between rice monogenic lines mainly developed at IRRI and China with single major gene and Korean *M. grisea* isolates was evaluated to develop new Korean blast differential systems as well as to select durable resistance genes to Korean *M. grisea* population.

Since major gene controlled resistance would not be so durable, attempts to identify durable resistance sources or develop multilines have been tested for blast. Large scale field experiment with promising results was reported in China recently. In Korea, field performance of rice blast resistance multilines was also investigated using Chucheongbyeo and Suweon 345 and their multilines. Significant difference in leaf and panicle blast incidences between susceptible parents and their multilines suggested that use of multilines would be promising in Korea. The multilines had been registered as a

commercial cultivars as Saechucheongbyeo and Anseongbyeo.

Durability of host resistance have also been investigated by QTL analysis along with linkage mapping with molecular markers. Various cultivar combinations in Korea, Japan, USA, China, IRRI *etc* have been developed and many QTL loci were positioned for blast resistance. Correlationship between quantitative resistance to blast and number of defence related genes was reported at IRRI. Candidate gene approach using resistance and defence related genes are currently carried out in M23 x Gihobyeo combination against blast.

Recently, genome mutation technique of *M. grisea* was developed by Lee in Korea. Functional genomics through the *M. grisea* mutant germplasm are currently carried out in Korea, which will be very promising to understand the mechanism of rice-blast interaction.

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