Mapping of the quantitative trait locus (QTL) conferring partial resistance to rice leaf blast disease

ABSTRACT

Malaysian rice, Pongsu Seribu 2, has wide-spectrum resistance against blast disease. Chromosomal locations conferring quantitative resistance were detected by linkage mapping with SSRs and quantitative trait locus (QTL) analysis. For the mapping population, 188 F3 families were derived from a cross between the susceptible cultivar, Mahsuri, and a resistant variety, Pongsu Seribu 2. Partial resistance to leaf blast in the mapping population was assessed. A linkage map covering ten chromosomes and consisting of 63 SSR markers was constructed. 13 QTLs, including 6 putative and 7 putative QTLs, were detected on chromosomes 1, 2, 3, 5, 6, 10, 11 and 12. The resulting phenotypic variation due to a single QTL ranged from 2 to 13 %. These QTLs accounted for approx. 80 % of the total phenotypic variation within the F3 population. Therefore, partial resistance to blast in Pongsu Seribu 2 is due to combined effects of multiple loci with major and minor effects.

Keyword: Leaf blast; Partial resistance; Quantitative trait locus (QTL); Rice (Oryza sativa); SSR markers