

IDENTIFICATION AND MAPPING OF DURABLE BLAST RESISTANCE LOCI IN A OLD RICE CULTIVAR

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Rice blast is the most serious rice (*Oryza sativa L.*) disease in rice-growing countries and is a major cause of yield reduction. To date, breeding of cultivated rice cvs for increase the resistance to blast is considered the best strategy contrasting this pathogen. Therefore, the biodiversity present in germplasm is important to find and to characterize new resistance source. Italy is the main rice producing country in Europe and many cvs was developed by breeders during years. Gigante Vercelli (GV) is an old Italian rice cv sp. *japonica* that exhibits wide and durable resistance to many isolates of the blast fungus *Magnaporthe oryzae*. Despite this fact, very little information are available with respect to GV blast resistance mechanisms.

To find out more about the genetic basis of GV blast resistance, an SSR-based linkage map was developed from an F2 population segregating for blast resistance derived from a cross between GV and Vialone Nano (VN). VN is a temperate *japonica* old Italian rice cv, is cultivated and is highly blast susceptible. About 140 SSR markers were mapped to all 12 rice chromosomes.

The F3 families were inoculated with a mix of three *M. oryzae* Italian isolates avirulent towards GV and phenotypic data were used to perform QTLs analyses. Two QTLs responsible for GV blast resistance were identified. The first one was mapped on chromosome 1 and has LOD=13.58 and R² 25.9%. The second was positioned on chromosome 4 and has LOD =16.19 and R² 32.7%. The mapping results therefore highlighted that the durable resistance of GV is derived from an unconscious accumulation of two resistance loci during the past century.

In the near future, a fine genetic map and a sequence analysis of regions of interest will be both performed to identify candidate genes for GV resistance functions. Currently, the identified genes may be used for pyramiding, a strategy which consists in the introgression of more alleles of resistance in a single genotype to obtain new rice cvs with durable and wide blast resistance.

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