

Rice (*Oryza sativa* L) is the main staple food for over 3 billion people (almost half the world population), and rice blast, caused by the fungus *Magnaporthe oryzae*, is the major threat for this crop worldwide, triggering also important losses in Spain some years. Some resistant cultivars have been released, mainly with complete resistance genes (*Pi* genes), but their resistance has not lasted long, due to the emergence of new virulent isolates. Therefore, the efforts for obtaining effective and durable resistance are focused nowadays on the use of partial resistance or a combination of partial and complete resistance. Partial resistance is a quantitative character, controlled by numerous genes of small effects (QTLs), that can interact among them, and usually also strongly with the environment. For a better knowledge of the population of *M. oryzae* in the Albufera region, and of the resistance genes and QTLs that might be effective in various Spanish rice growing regions, we tested along four years 31 differential varieties (isogenic lines carrying one different *Pi* gene each); these studies showed that fungus population can significantly change from one year to the other. On the other hand, we analyzed the genetics of resistance to *M. oryzae* in two populations derived from crosses between local and well adapted, although moderately susceptible, varieties (Sivert, JSendra), and allegedly resistant but poorly adapted varieties (CAN-6159, Gigante Vercelly. In F3 lines of both populations, the leaf and panicle susceptibility was determined in field trials under conditions that favour the infection: SixCNA lines were tested in a plot in the Albufera region, and those of JSxGV in four locations of Valencia, the Ebro River Delta, and Seville; inoculations in controlled conditions were also carried out in the second population. We compare the different methodologies for assessing susceptibility, and we discuss the environmental influence on it. 22 QTLs were detected in SixCNA, and 61 in JSxGV, most of them in only one location. All four parents displayed partial resistance QTLs; but some QTLs showed small additive effects and, often, high dominance. At the same time, most of these QTLs exhibit significant interactions with other QTLs; and many of them co-localize with QTLs found in other studies. We have discovered substantial coincidences between QTLs that control incidence in panicle and those that determine leaf severity, thus supporting the hypothesis that there are common defence mechanisms in both organs. Chromosomal regions of interest for marker assisted breeding of resistant genotypes have been identified.