

Detection and monitoring of fungicide resistance in the rice blast pathogen by innovative molecular methods

Rice blast, caused by *Pyricularia oryzae*, is one of the most important rice diseases worldwide, causing globally 30% yield losses, threatening thus global food security. Rice blast management relies on fungicides, especially in Europe, as susceptible traditional rice varieties are extensively grown. Often, the first choice among a very limited spectrum of chemical control means are quinone outside inhibitor (QoI) fungicides. However, they are classified as high-risk fungicides as they are prone to resistance development in fungal pathogens. Until now, QoI resistance has been detected in ca. 40 different plant pathogens. Recently, azoxystrobin-resistant strains have been identified in *P. oryzae* from rice in Japan and Vietnam, which poses concerns about the spread of QoI resistance also in other rice-growing areas. Despite this, no reliable and sensitive detection method of QoI resistance in *P. oryzae* populations exists at the moment.

We developed an allele-specific qPCR-based method for the detection of QoI-resistant strains of *P. oryzae*. It is based on selective amplification of sensitive (S) or resistant (R) allele of cytochrome b. The method was developed using plasmids with cloned cytochrome b fragment containing or not the single-point mutation and was further verified on genomic DNA mixtures isolated from sensitive and resistant *P. oryzae* strains. Moreover, the specificity of primers was verified on several non-target fungal pathogens.

Kunova A¹, Tava V¹, Pasquali M¹, Saracchi M¹, Cortesi P¹

¹ DeFENS, University Of Milan, Milan, Italy