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SCREENING TOMATO GERMPLASM FOR RESISTANCE TO LATE BLIGHT

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Late blight, caused by *Phytophthora infestans*, is a re-emerging damaging disease in tomato crops, under wet environments. In organic tomato production, copper-based fungicides are used to directly control late blight. Due to environmental concerns, the use of fungicides has to be reduced and growing resistant cultivars is an alternative. The three resistance genes introgressed into tomato cultivars since the 1970s, named Ph-1, Ph-2 and Ph-3, have been overcame by new populations of *P. infestans*. It has been demonstrated in several pathosystems that polygenic resistance is more durable than monogenic resistance, so, there is a need for new resistance genes or QTLs, and to combine them in order to build durable resistance to *P. infestans*.

A highly aggressive isolate of *P. infestans* (Pi100) was collected on tomato, near Avignon (FRANCE) in 2012. Pi100 didn't overcome the resistance conferred by the Ph-3 gene, but overcame the resistance conferred by the Ph-2 gene. Nevertheless, Ph-2 confers a residual resistance effect to the Pi100 isolate, as the progression of the disease was slowed down in all cultivars carrying Ph-2. We elaborated a resistance assay, to identify tomato accessions with a resistance level better than that of cv. Pieraline, carrying Ph-2. Using Pi100, we screened 150 accessions of *Solanum pimpinellifolium, S. lycopersicum var. cerasiforme* and controls for resistance to *P. infestans*. We identified four accessions with partial resistance to Pi100, with a resistance level better than that observed on Pieraline. In addition, we confirmed that four accessions from *S. habrochaites*, already reported in the literature as late blight resistant, also blocked the Pi100 life cycle. Crosses are underway to generate progenies for QTL mapping. Several combinations of resistance genes and/or QTLs will be evaluated with a set of isolates representative of *P. infestans* diversity, to estimate the potential durability of these combinations.

Keywords: tomato, *Phytophthora infestans*, disease resistance, germplasm screening, genetic resistance.