Mapping Quantitative Trait Loci (QTL) for Resistance to Late Blight in Tomato

Tina Wu

Phytophthora infestans causes late blight on tomatoes and potatoes and is a major agricultural concern worldwide. Under favorable conditions, this disease can devastate fields in a matter of days. Efforts to breed for disease resistant tomatoes have resulted in the discovery of three resistance genes, *Ph-1*, *Ph-2*, and *Ph-3*. Additional factors or quantitative trait loci (QTL) with resistance to late blight likely exist. Authors Dilip R. Panthee, Ann Piotrowski, and Ragy Ibrahem from North Carolina State University made intra-specfic crosses of tomato plants with the goal of mapping late blight resistance genes and associated QTL within the tomato population. They crossed NC1 CELBR conferring resistance to late blight with a susceptible line Fla. 7775 and analyzed F2 and F2 derived populations for phenotypic variations of disease resistance in 2011, 2014, and 2015. Two major QTL associated with late blight resistance was located on chromosomes 9 and 10. A novel minor QTL was also located on chromosome 12. QTLs on chromosomes 9 and 10 had likelihood of odd (LOD) scores of 42 and 7.4 respectively, which explained 67% and 14% of total phenotypic variance. These findings may help in the development of marker assisted selection and more durable resistance to tomato late blight.