PM pathogen identification
Pathogen isolation
DNA extraction
ITS region sequencing
Phylogenetic analysis
SNP genotyping
Genotypic data preparation
Genomic DNA extraction of tomato germplasm
Genotyping of 51,214 SNP loci per accession through 55K Axiom® Tomato Genotyping Array
SNP genotyping data QC
PMR Bioassay
Phenotypic data preparation
Tomato germplasm 348 accessions
Pathogen inoculation
Resistance assessment
Resistant germplasm evaluation using PMR-linked markers
Tomato accessions and SNP filtering
[Phenotypic data] Tomato germplasm 290 accessions
[Genotypic data] 11,912 SNPs
Population structure analysis
STRUCTURE program
Calculate genetic distance and ΔK
Marker-trait association analysis
GWAS
TASSEL program
GAPIT program
Common significant SNPs excavation (P-value < 0.001)
PMR-QTL regions identification
Putative candidate PMR gene selection