

# Plant Genomics

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## Whole genome sequencing of ten pathotypes of *Xanthomonas oryzae* pv. *oryzae* using a combination of Illumina and PacBio sequencing chemistries

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Bacterial blight (BB) of rice caused by *Xanthomonas oryzae* pv. *oryzae* (*Xoo*) is one of the major diseases of rice. The pathogen is highly variable and the current *Xoo* population is classified into ten pathotypes in north western India. The ten pathotypes designated as PbXo-1 to PbXo-10 were differentiated using set of near isogenic lines. None of the genes are effective individually against these pathotypes, thus necessitating pyramiding of genes for durability of resistance to BB. The ten pathotypes have been collected from Punjab state of India, which is less than 1.5% of total area the country and started growing rice on large scale from 1970 onward. DNA from single colony from each of the 10 *Xoo* pathotypes was isolated and sequenced to more 100x coverage using Illumina and PacBio platforms. Hybrid assembly of the Illumina and PacBio reads lead to assemblage of seven pathotypes into single molecule and the remaining three pathotypes assembled into 11-15 contigs. Gene prediction revealed high gene density on both strands with 5500 genes on an average. More than 50 tRNA genes were identified in the *Xoo* pathotypes which is >95% of the reference genome. We are analyzing the data for TAL Effector genes which form the majority of the *avr* genes in *Xoo* as well as for other fitness gene. The comparative analysis of the whole genome sequences of all these ten pathotypes along with the other known reference genomes can provide insights into *Xoo* strain evolution and may help us in finding novel effector genes controlling the disease pathway.

### Biography

Jagjeet Singh Lore has completed his PhD in Plant Pathology from Punjab Agricultural University, Ludhiana, India. Presently, he is working as Plant Pathologist (Rice) and actively involved in screening and identification of donors for multiple disease resistance in rice and has identified ten pathotypes of *Xanthomonas oryzae* pv. *oryzae* in Punjab. He has standardized screening protocols for sheath blight and neck blast diseases. He has actively contributed towards the development of high yielding bacterial blight resistant rice varieties occupying a large area in Northern India. He is working in collaboration with International Rice Research Institute. He is also a Co-PI in several ad hoc research projects on rice improvement and has published more than 40 research articles in reputed national and international journals.

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