

Category	: International Rice Research Conference
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Keyword 1	: Biotic stress tolerance
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Title of Entry	: New R genes for bacterial blight resistance in rice versus pathogen population structure in Northern-Western region of India
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Bacterial blight (BB) of rice caused by <i>Xanthomonas oryzae</i> pv. <i>oryzae</i> (Xoo) is widely distributed in particularly endemic to most parts of Asia. The pathogen is highly variable and possesses a number of virulence factors responsible for its pathogenicity and race differentiation. Until today, 42 R genes (Xa/xa) for bacterial blight resistance in rice have been identified. A total of 50 strains including 10 key pathotypes of Xoo existing in Northern-Western India have been tested against new R genes Xa23, Xa33, Xa38 and xa(g) (Unpublished), 29 near isogenic lines and 10 rice cultivars. The pathogen population was more aggressive and became virulent to most of the single BB resistance genes such as Xa1, Xa3, Xa4, xa5, Xa7, xa8, Xa10, Xa11, xa13, Xa21, Xa23, Xa33, Xa38 and even some of the Xoo strains showing virulence on pyramided genes such as Xa4+xa5, Xa4+Xa21, xa5+Xa21 and xa13 + Xa21. Some of the genes viz. xa13, Xa23, Xa33 and Xa38 are good effective, but pathotype PbXo-8 became virulent on xa13 and PbXo10 virulent on Xa23 and Xa38. The pathotype PbXo-7 showed moderate level of virulence to Xa33. None of the individual gene except new gene xa(g) is effective against the pathogen population existing in Northern-Western India. The new gene xa (g) had broad spectrum resistance to all ten pathotypes prevalent in India. Moreover, this new gene was incorporated in mega rice variety Pusa 44 and it was released as new variety PR127 in Punjab state of Northern India during the year 2018. Some of the other new rice cultivars like PR121, PR122, PR123, PR124, Punjab Basmati 3, Punjab Basmati 4 and Punjab Basmati 5 with two (xa13+Xa21) or three pyramided genes (Xa4+xa13+Xa21) showed resistance to all the key pathotypes and Xoo strains. Breeding for bacterial blight resistance with deployment of New R genes/ gene pyramiding in high yielding rice cultivars along with pathogen population monitoring are the key

approach, economical and eco-friendly strategy for the management of rice bacterial blight in future.

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