Genetic of Quantitative Resistance to Brown Planthopper in Rice: Identification of QTL for different mechanisms of Resistance to Brown Planthopper in Rice

In understanding the genetic architecture of plant resistance to insects, the magnitude or level of resistance can be qualitatively determined by analysis of standard scoring systems or quantitatively by establishment or development of insects. For pre-use genetic analysis, knowledge on the mechanisms of resistance is essential. This book narrates genetics of resistance involving different screening methods based on mechanisms of resistance through Quantitative Trait Loci (QTL) analysis for rice brown planthopper (BPH), Nilaparvata lugens. Genetic analysis through QTL mapping resulted in the identification of 7 putative and 16 probable QTLs associated with BPH resistance. The identified putative QTL were mapped to the following linkage groups: chromosome 1 (RZ276-RG146), chromosome 2 (RG157-RZ318), chromosome 6 (RG213-Est2), chromosome 6 (RG146-RG345), chromosome 6 (Pgi2-PRD10B), chromosome 7 (Est-RZ337B) and chromosome 7 (RG773-CD659). This book will provide basic concepts for studying the genetics of resistance in crop plants to insect pests and explore quantitative genetic nature of resistance to identify minor genes responsible for individual components of resistance.

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Responses of Two Contrasting Genotypes of Rice to Brown Different Rice Mapping Populations in the Same detect brown planthopper (BPH) resistance genes. and quantitative BPH resistance has been well studies resistance genes and

one QTL on chromosome 127-10. identified from this study should be useful in marker- .. resistance mechanisms in rice is necessary. **Genetic analysis and molecular mapping of QTLs for resistance to** conferring resistance to brown planthopper in rice . only insect-resistance gene that has been cloned in plants is the Bph14 showed a stable resistance in different . the resistance mechanism of the Bph14-transgenic plants, we .. feeding responses was amplified by quantitative RT-PCR, using an **Identification and characterization of Bph14, a gene - PNAS** Identification of quantitative trait loci associated with small brown planthopper (Laodelphax striatellus Fallen) resistance in rice (Oryza sativa L.) Using the F2 population, three QTLs for antixenosis against SBPH were located of resistance genes and pyramiding resistance genes from different origins to **Genetic mapping of the rice resistance-breaking gene of the brown** Three new QTLs for RBSDV resistance were identified in this study, i.e., which is transmitted by small brown planthoppers (Laodelphax striatellus This disease leads to severe rice yield losses in China and other East Asian countries. Because the mechanism of resistance to rice black-streaked dwarf **Detection of Quantitative Trait Loci (QTLs) for Resistances to - NCBI** Ovicidal resistance is a natural rice defense mechanism against The other three WBHP resistance genes, Wbph35, have not yet been In addition to these major WBPH-resistance genes, a number of quantitative trait loci (QTLs) sap-sucking insect brown planthopper (BPH) [22], and water weevil [23]. **Recent progress on the genetics and molecular breeding of - Rice** A total of 28 different brown planthopper resistance genes have since been identified in Virulence of brown planthoppers on rice plants . A QTL analysis for virulence was performed using interval mapping (IM) with 5% Quantitative trait loci identified for virulence traits in the F1 and F2 populations. **Quantitative trait loci identification, fine mapping and gene** quantitative resistance to rice brown planthopper (BPH), Of the main-effect QTLs identified,. QBphr5b was tance genes, the other six detected main-effect QTLs were all . result from different mechanisms, such as non-prefer- ence or **RFLP-facilitated investigation of the quantitative resistance of rice to** is one of the major insect pests of rice (Oryza sativa L.). Exploitation of evaluated under glass house condition for brown planthopper resistance. Two leaf **Detection of Brown Planthopper Resistance Genes from Different** one BPH resistance gene (Bph14) was identified and characterized using receptor of NBLRR family, providing a means for studying the molecular mechanisms of rice resistance to Key words: rice brown planthopper innate immunity BPHfeeding cascade. . quantitative trait loci (QTLs) is more durable (Alam and. **Towards Understanding of Molecular Interactions between Rice and** Brown planthopper (BPH) is the most devastating pest of rice. To date, 29 major BPH resistance genes have been identified from indica cultivars Rice varieties have different mechanisms of resistance to BPH, classed as to markers, quantitative trait loci (QTL) mapping and marker-assisted selection **Quantitative trait loci identification, fine mapping and gene** Marker-assisted selection for rice brown planthopper (Nilaparvata lugens) resistance using molecular mechanism of host-plant resistance to BPH is and identify the markers linked to BPH-resistant genes and quantitative trait loci (QTLs) on rice chromosomes. . model fit well and was not significantly different from the. **Recent progress on the genetics and molecular breeding of brown** Our work provides insights into the molecular mechanisms of rice defense against Among the herbivorous rice insects, the brown planthopper (BPH) Bph14 showed a stable resistance in different genetic backgrounds and thus .. in BPH feeding responses was amplified by quantitative RT-PCR, using **Current Status of Brown Planthopper (BPH) Resistance and Genetics** Brown planthopper (BPH) is the most devastating pest of rice. Host-plant To date, 29 major BPH resistance genes have been identified from indica cultivars and wild rice species, Rice varieties have different mechanisms of resistance to BPH quantitative trait loci (QTL) mapping and marker-assisted selection for crop. **Genome-Wide Mapping of Virulence in Brown Planthopper Identifies** This disease leads to severe rice yield losses in China and other East Asian countries. Because the mechanism of resistance to rice black-streaked dwarf disease . The identification of genes conferring resistance to plant diseases and .. to small brown planthopper (Laodelphax striatellus Fallen) in rice **Gene expression and plant hormone levels in two contrasting rice** Rice brown planthopper (BPH Nilaparvata lugens Stal), which At least 30 BPH-resistance quantitative trait loci (QTLs) have been identified in rice. understanding of the molecular mechanisms of resistant rice to BPH In addition to the major BPH-resistance QTLs, many other rice genes that modulate **Genetic mapping of the rice resistance-breaking gene of the brown** An urgent need exists to identify more brown planthopper (Nilaparvata linked to another BPH resistance gene, bph4, in the rice variety Babawee. . To reveal the molecular mechanisms underlying Bph32-mediated BPH resistance, we . The quantitative resistance locus (QRL) qBPH(t), unlike Ptb33, **Recent progress on the genetics and molecular breeding of brown** The brown planthopper (BPH) is the most notorious pest of rice (Oryza sativa). and the genetic and molecular mechanism of resistance signaling transduction. . More than 30 QTLs have been identified

among rice chromosomes 1, . Two other cloned plant insect resistance genes, Mi-1.2 and Vat, also **Recent progress on the genetics and molecular breeding of brown Genome-Wide Mapping of Virulence in Brown Planthopper Identifies** This article has been cited by other articles in PMC. Ovicidal resistance is a natural rice defense mechanism against WBPH and In addition to these major WBPH-resistance genes, a number of quantitative trait loci (QTLs) have sap-sucking insect brown planthopper (BPH) [22], and water weevil [23]. **Marker-assisted selection for rice brown planthopper (Nilaparvata** Brown planthopper (BPH) is the most devastating pest of rice. To date, 29 major BPH resistance genes have been identified from indica cultivars and wild rice species, and more Rice varieties have different mechanisms of resistance to BPH, classed as . Chromosome locations of BPH resistance genes/QTLs in rice **Bph32, a novel gene encoding an unknown SCR domain-containing** Besides identification of major resistance genes, some quantitative trait loci (QTLs) associated with BPH resistance have also been identified on eight chromosomes. Most of KeywordsRice-Brown planthopper-Genetics-Resistance-Major genes-Gene mapping .. resistance to different BPH biotypes have been identified. **Genetic analysis and molecular mapping of QTLs for resistance to** Small brown planthopper (SBPH) and rice stripe virus (RSV) . To identify the locus for SBPH resistance, the recombinant inbred lines . QTL analysis of different resistance phenotypes will reveal the genetic mechanisms of **Detection of Quantitative Trait Loci (QTLs) for Resistances to - MDPI** Small Brown Planthopper and Rice Stripe Virus in Rice Using . To identify the locus for SBPH resistance, the recombinant inbred lines . QTL analysis of different resistance phenotypes will reveal the genetic mechanisms of **Genetics and Genomics of Rice - Google Books Result** Brown planthopper (BPH) is the most devastating pest of rice. To date, 29 major BPH resistance genes have been identified from indica cultivars and wild Rice varieties have different mechanisms of resistance to BPH, classed as .. An introduction to markers, quantitative trait loci (QTL) mapping and **Identification and characterization of Bph14, a gene - NCBI - NIH** Rice (Oryza sativa L.) and brown planthoppers (BPH) (Nila- and death of susceptible plants, the molecular mechanisms involved need ments. B5, an introgression line carrying BPH resistance genes involved in rice responses to BPH and other phloem-feeding genes and two quantitative trait loci (QTL) against BPH. **PDF (2 MB) - Cell Press** The brown planthopper is the most destructive insect rice pest and poses a As a result, plants evolved R genes that mediate specific pathogen resistance mechanisms in A total of 28 different brown planthopper resistance genes have .. Quantitative trait loci identified for virulence traits in the F1 and F2 **IDENTIFICATION OF QTLS FOR BROWN PLANTHOPPER** Besides identification of major resistance genes, some quantitative trait loci (QTLs) associated with BPH resistance have also been Rice Brown planthopper Genetics Resistance Major genes Gene mapping . Since then, many donors for resistance to different BPH biotypes have been identified. Some of International Rice Research Institute, Los Banos, Philippines, pp401427 9. Fine mapping of the rice Bph1 gene, which confers resistance to the brown planthopper Liu GJ, Zhuang JY (2010) Identification of quantitative trait loci for resistance Wan J (2009) Analysis of QTLs for resistance to small brown planthopper **Identification of quantitative trait loci associated with small brown** Antixenosis and Tolerance of Rice Genotypes Against Brown Planthopper resistance breeding after tagging of resistant genes/QTLs linked to different parameters Also, many of the 29 BPH resistance genes identified so far are not effective in India. .. Detection of quantitative trait loci (QTL) associated with resistance to