

## GEPHE SUMMARY

	Gephebase Gene		GepheID
Piz-t ( <a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~Piz-t^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~Piz-t^#gephebase-summary-title</a> )		GP00000895	
	Entry Status	Courtier	Main curator
Published			

## PHENOTYPIC CHANGE

	Trait Category	
Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology^#gephebase-summary-title</a> )		
	Trait	
Pathogen resistance ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=~Pathogen+resistance^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=~Pathogen+resistance^#gephebase-summary-title</a> )		
	Trait State in Taxon A	
Oryza sativa - blast susceptible CO39		
	Trait State in Taxon B	
Oryza sativa - blast resistant Toride-1		
	Ancestral State	
Data not curated		
	Taxonomic Status	
Domesticated ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Domesticated^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Domesticated^#gephebase-summary-title</a> )		

Taxon A	Latin Name	Taxon B	Latin Name
Oryza sativa ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Oryza+sativa^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Oryza+sativa^#gephebase-summary-title</a> )			
	Common Name		Common Name
rice	rice	rice	rice
	Synonyms		Synonyms
rice; red rice; Oryza sativa L.			
	Rank		Rank
species	species	species	species
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae; Oryzinae; Oryza	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae; Oryzinae; Oryza	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae; Oryzinae; Oryza	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzaceae; Oryzinae; Oryza
	Parent		Parent
Oryza () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527</a> )	Oryza () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527</a> )	Oryza () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527</a> )	Oryza () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527</a> )
	NCBI Taxonomy ID		NCBI Taxonomy ID
4530 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530</a> )			
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
Yes	Yes	Yes	Yes
	Taxon A Description		Taxon B Description
Oryza sativa - blast susceptible CO39	Oryza sativa - blast susceptible CO39	Oryza sativa - blast resistant Toride-1	Oryza sativa - blast resistant Toride-1

## GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Oryza sativa subsp. japonica
Piz-t		Q0H213 ( <a href="http://www.uniprot.org/uniprot/Q0H213">http://www.uniprot.org/uniprot/Q0H213</a> )	
	Synonyms		GenebankID or UniProtKB
-		ABC73398 ( <a href="https://www.ncbi.nlm.nih.gov/nuccore/ABC73398">https://www.ncbi.nlm.nih.gov/nuccore/ABC73398</a> )	
	String		
-			
	Sequence Similarities		
Belongs to the disease resistance NB-LRR family.			
	GO - Molecular Function		
GO:0043531 : ADP binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0043531">https://www.ebi.ac.uk/QuickGO/term/GO:0043531</a> )			
	GO - Biological Process		
-			
	GO - Cellular Component		
-			
			Presumptive Null
No ( <a href="https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~No^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~No^#gephebase-summary-title</a> )			

Coding (<https://www.gephebase.org/search-criteria?/and+Molecular+Type=^Coding^#gephebase-summary-title>)

Molecular Type

SNP (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=^SNP^#gephebase-summary-title>)

Aberration Type

Nonsynonymous

SNP Coding Change

Coding variation in the LRR domain

Molecular Details of the Mutation

Linkage Mapping (<https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=^Linkage+Mapping^#gephebase-summary-title>)

Experimental Evidence

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Main Reference

The eight amino-acid differences within three leucine-rich repeats between Pi2 and Piz-t resistance proteins determine the resistance specificity to Magnaporthe grisea. (2006) (<https://pubmed.ncbi.nlm.nih.gov/17073304>)

Authors

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Abstract

The rice blast resistance (R) genes Pi2 and Piz-t confer broad-spectrum resistance against different sets of Magnaporthe grisea isolates. We first identified the Pi2 gene using a map-based cloning strategy. The Pi2 gene is a member of a gene cluster comprising nine gene members (named Nbs1-Pi2 to Nbs9-Pi2) and encodes a protein with a nucleotide-binding site and leucine-rich repeat (LRR) domain. Fine genetic mapping, molecular characterization of the Pi2 susceptible mutants, and complementation tests indicated that Nbs4-Pi2 is the Pi2 gene. The Piz-t gene, a Pi2 allele in the rice cultivar Toride 1, was isolated based on the Pi2 sequence information. Complementation tests confirmed that the family member Nbs4-Piz-t is Piz-t. Sequence comparison revealed that only eight amino-acid changes, which are confined within three consecutive LRR, differentiate Piz-t from Pi2. Of the eight variants, only one locates within the xxLxLxx motif. A reciprocal exchange of the single amino acid between Pi2 and Piz-t did not convert the resistance specificity to each other but, rather, abolished the function of both resistance proteins. These results indicate that the single amino acid in the xxLxLxx motif may be critical for maintaining the recognition surface of Pi2 and Piz-t to their respective avirulence proteins.

Additional References

## RELATED GEPHE

15 (Pi-ta, Pi2 (Nbs4-Pi2), Pi36, Pi37, Pi5-1 + Pi5-2 cluster, Pi9 (= Nbs2-Pi9), Pib, Pid3, PigmR, Pikm1-TS + Pikm2-TS cluster, Pit, SLB1/2, Xa1, Xa21, Xa26) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=^4530^/and+Trait=Pathogen+resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Genes

No matches found.

Related Haplotypes

## EXTERNAL LINKS

## COMMENTS