

## GEPHE SUMMARY

	Gephebase Gene	GephelD
Rp1-D ( <a href="https://www.gephebase.org/search-criteria?/and+Gene Gephebase=%Rp1-D^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene Gephebase=%Rp1-D^#gephebase-summary-title</a> )	GP00000998	
	Entry Status	Main curator
Published	Martin	

## 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	
Zea mays - rust susceptible	Trait State in Taxon B	
Zea mays - rust resistant	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		Taxon B
Zea mays	Latin Name	Latin Name
( <a href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=%Zea mays^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=%Zea mays^#gephebase-summary-title</a> )		
-	Common Name	Common Name
Zea mays var. japonica; maize; Zea mays L.; Zea mays mays species	Synonyms	Synonyms
	Rank	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Tripsacinae; Zea	Lineage	Lineage
Zea () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4575">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4575</a> )	Parent	Parent
4577 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4577">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4577</a> )	NCBI Taxonomy ID	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?

## GENOTYPIC CHANGE

Rp1-D	Generic Gene Name	UniProtKB Zea mays
-	Synonyms	GenebankID or UniProtKB
-	String	
Belongs to the disease resistance NB-LRR family.	Sequence Similarities	
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 - Molecular Function	
-	GO - Biological Process	
-	GO - Cellular Component	
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> )		Presumptive Null
Gene Amplification ( <a href="https://www.gephebase.org/search-criteria?/and+Molecular Type=%Gene Amplification^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Molecular Type=%Gene Amplification^#gephebase-summary-title</a> )		Molecular Type

Complex Change ([https://www.gephebase.org/search-criteria/?and+Aberration Type=%5EComplex Change%5E#gephebase-summary-title](https://www.gephebase.org/search-criteria/?and+Aberration%20Type=%5EComplex%20Change%5E#gephebase-summary-title))

Molecular Details of the Mutation

Unequal crossing over between paralogues resulting in chimeric gene

Experimental Evidence

Candidate Gene ([https://www.gephebase.org/search-criteria/?and+Experimental Evidence=%5ECandidate Gene%5E#gephebase-summary-title](https://www.gephebase.org/search-criteria/?and+Experimental%20Evidence=%5ECandidate%20Gene%5E#gephebase-summary-title))

Main Reference

Molecular characterization of the maize Rp1-D rust resistance haplotype and its mutants. (1999) (<https://pubmed.ncbi.nlm.nih.gov/10402435>)

Authors

Collins N; Drake J; Ayliffe M; Sun Q; Ellis J; Hulbert S; Pryor T

Abstract

The Rp1-D gene for resistance to maize common rust (*Puccinia sorghi*) is a member of a complex locus (haplotype) composed of Rp1-D and approximately eight other gene homologs. The identity of Rp1-D was demonstrated by using two independent gene-tagging approaches with the transposons Mutator and Dissociation. PIC20, a disease resistance (R) gene analog probe previously mapped to the rp1 locus, detected insertion of Dissociation in an Rp1-D mutation and excision in three revertants. Independent libraries probed with the PIC20 or Mutator probes resulted in isolation of the same gene sequence. Rp1-D belongs to the nucleotide binding site, leucine-rich repeat class of R genes. However, unlike the rust resistance genes M and L6 from flax, the maize Rp1-D gene does not encode an N-terminal domain with similarity to the signal transduction domains of the *Drosophila* Toll protein and mammalian interleukin-1 receptor. Although the abundance of transcripts of genes from the rp1 complex changed with leaf age, there was no evidence of any change due to inoculation with avirulent or virulent rust biotypes. A set of 27 Rp1-D mutants displayed at least nine different deletions of Rp1-D gene family members that were consistent with unequal crossing-over events. One mutation (Rp1-D\*-24) resulted in deletion of all but one gene family member. Other unique deletions were observed in the disease lesion mimic Rp1-D\*-21 and the partially susceptible mutant Rp1-D\*-5. Different rp1 specificities have distinct DNA fingerprints (haplotypes). Analysis of recombinants between rp1 specificities indicated that recombination had occurred within the rp1 gene complex. Similar analyses indicated that the rust R genes at the rp5 locus, 2 centimorgans distal to rp1, are not closely related to Rp1-D.

Additional References

Recombination between paralogues at the Rp1 rust resistance locus in maize. (2001) (<https://pubmed.ncbi.nlm.nih.gov/11333250>)

Contrasting evolutionary patterns of the Rp1 resistance gene family in different species of Poaceae. (2011) (<https://pubmed.ncbi.nlm.nih.gov/20713469>)

## RELATED GEPHE

### Related Genes

5 (HM1 = HC toxin reductase (HCTR), HM1 = HC toxin reductase (HCTR) [possible pseudo-replicate from other Maize entry], HM2 = HC toxin reductase (HCTR), Lysine histidine transporter 1, Rp3 cluster) ([https://www.gephebase.org/search-criteria/?or+Taxon ID=%5E4577%5Eand+Trait=Pathogen resistance%5Eand+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria/?or+Taxon%20ID=%5E4577%5Eand+Trait=Pathogen%20resistance%5Eand+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS