

GEPHE SUMMARY

Rhg1 (https://www.gephebase.org/search-criteria?/and+Gene)	Gephebase Gene	GP00000985	GepheID
Gephebase= [^] Rhg1 [^] #gephebase-summary-title)			Main curator
Published	Entry Status	Martin	

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+Trait)	Trait Category		
Category= [^] Physiology [^] #gephebase-summary-title)			
Pathogen resistance (cyst nematode) (https://www.gephebase.org/search-criteria?/and+Trait)	Trait		
criteria= [^] Pathogen resistance (cyst nematode) [^] #gephebase-summary-title)			
Glycine max - sensitive	Trait State in Taxon A		
Glycine max - resistant - rhg1-b allele - "PI 88788-type"; high-copy number; four or more Rhg1 repeats	Trait State in Taxon B		
Data not curated	Ancestral State		
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic)	Taxonomic Status		
Status= [^] Intraspecific [^] #gephebase-summary-title)			
	Taxon A	Taxon B	
	Latin Name	Latin Name	
Glycine max	Glycine max	Glycine max	
(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms= [^] Glycine max [^] #gephebase-summary-title)	(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms= [^] Glycine max [^] #gephebase-summary-title)	(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms= [^] Glycine max [^] #gephebase-summary-title)	
	Common Name	Common Name	
soybean	soybean	soybean	
	Synonyms	Synonyms	
soybean; soybeans; Glycine max (L.) Merr.; Glycine max; cv. Wye	soybean; soybeans; Glycine max (L.) Merr.; Glycine max; cv. Wye	soybean; soybeans; Glycine max (L.) Merr.; Glycine max; cv. Wye	
	Rank	Rank	
species	species	species	
	Lineage	Lineage	
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Fabales; Fabaceae; Papilionoideae; 50 kb inversion clade; NPAAA clade; indigoferoid/millettioid clade; Phaseoleae; Glycine; Soja	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Fabales; Fabaceae; Papilionoideae; 50 kb inversion clade; NPAAA clade; indigoferoid/millettioid clade; Phaseoleae; Glycine; Soja	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Fabales; Fabaceae; Papilionoideae; 50 kb inversion clade; NPAAA clade; indigoferoid/millettioid clade; Phaseoleae; Glycine; Soja	
	Parent	Parent	
Soja () - (Rank: subgenus)	Soja () - (Rank: subgenus)	Soja () - (Rank: subgenus)	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1462606)	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1462606)	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1462606)	
	NCBI Taxonomy ID	NCBI Taxonomy ID	
3847	3847	3847	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3847)	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3847)	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3847)	
	is Taxon A an Infrappecies?	is Taxon B an Infrappecies?	
No	No	No	

GENOTYPIC CHANGE

rhg1s	Generic Gene Name	Q8L3Y5 (http://www.uniprot.org/uniprot/Q8L3Y5)	UniProtKB Glycine max
Rfs2; Rhg1; rhg1g	Synonyms	JN597009 (https://www.ncbi.nlm.nih.gov/nucleotide/JN597009)	GenebankID or UniProtKB
-	String		
-	Sequence Similarities		
-	GO - Molecular Function		
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)			
GO:0004672 : protein kinase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004672)			
-	GO - Biological Process		
-	GO - Cellular Component		
GO:0016021 : integral component of membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016021)			

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null="+No+"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=))

Presumptive Null

Gene Amplification ([https://www.gephebase.org/search-criteria?/and+Molecular Type="+Gene Amplification+"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type=))

Molecular Type

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

Aberration Type

Copy number Variant : 10-tandem copies of the gene cluster in resistant strains ; the 3 dissimilar genes participate to resistance

Molecular Details of the Mutation

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence="+Linkage Mapping+"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=))

Experimental Evidence

Copy number variation of multiple genes at Rhg1 mediates nematode resistance in soybean. (2012) (<https://pubmed.ncbi.nlm.nih.gov/23065905>)

Main Reference

Cook DE; Lee TG; Guo X; Melito S; Wang K; Bayless AM; Wang J; Hughes TJ; Willis DK; Clemente TE; Diers BW; Jiang J; Hudson ME; Bent AF

Authors

The rhg1-b allele of soybean is widely used for resistance against soybean cyst nematode (SCN), the most economically damaging pathogen of soybeans in the United States. Gene silencing showed that genes in a 31-kilobase segment at rhg1-b, encoding an amino acid transporter, an $\text{I}\pm$ -SNAP protein, and a WI12 (wound-inducible domain) protein, each contribute to resistance. There is one copy of the 31-kilobase segment per haploid genome in susceptible varieties, but 10 tandem copies are present in an rhg1-b haplotype. Overexpression of the individual genes in roots was ineffective, but overexpression of the genes together conferred enhanced SCN resistance. Hence, SCN resistance mediated by the soybean quantitative trait locus Rhg1 is conferred by copy number variation that increases the expression of a set of dissimilar genes in a repeated multigene segment.

Abstract

Additional References

RELATED GEPHE

1 (Rgh4) ([https://www.gephebase.org/search-criteria?/or+Taxon ID="+3847+"/and+Trait=Pathogen resistance/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=))

Related Genes

1 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase="+Rhg1"/and+Taxon ID="+3847"/or+Gene Gephebase="+Rhg1"/and+Taxon ID="+3847"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=))

Related Haplotypes

EXTERNAL LINKS

COMMENTS