GEPHE SUMMARY

Gephebase Gene
RPS5 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^RPS5^#gephebase-summary-title)

GepheID
GP00001014

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)

Trait
Pathogen resistance (https://www.gephebase.org/search-criteria?/and+Trait=^Pathogen resistance^#gephebase-summary-title)

Trait State in Taxon A
Arabidopsis thaliana- Col0 - resistant

Trait State in Taxon B
Arabidopsis thaliana- Ler-0 sensitive

Ancestral State
Data not curated

Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)

Taxon A

Latin Name
Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Arabidopsis thaliana^#gephebase-summary-title)

Common Name
thale cress

Synonyms
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis

Parent
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3701)

NCBI Taxonomy ID
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3702)

is Taxon A an Infraspecies?
Yes

Taxon A Description
Arabidopsis thaliana- Col0 - resistant

Taxon B

Latin Name
Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Arabidopsis thaliana^#gephebase-summary-title)

Common Name
thale cress

Synonyms
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis

Parent
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3701)

NCBI Taxonomy ID
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3702)

is Taxon B an Infraspecies?
Yes

Taxon B Description
Arabidopsis thaliana- Ler-0 sensitive

GENOTYPIC CHANGE

Generic Gene Name
RPS5

Synonyms
DISEASE RESISTANCE PROTEIN RPS5; RESISTANT TO P. SYRINGAE 5; T28K15.5; T28K15_5; At1g12220

String
3702.AT1G12220.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT1G12220.1)

Sequence Similarities
Belongs to the disease resistance NB-LRR family.

GO - Molecular Function
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)
GO:0042802 : identical protein binding (https://www.ebi.ac.uk/QuickGO/term/GO:0042802)

UniProtKB Arabidopsis thaliana
O64973 (http://www.uniprot.org/uniprot/O64973)

GenebankID or UniProtKB
U97221 (https://www.ncbi.nlm.nih.gov/nuccore/U97221)

GO:0000166 : nucleotide binding (https://www.ebi.ac.uk/QuickGO/term/GO:0000166)
GO:0043531 : ADP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0043531)
GO:0038023 : signaling receptor activity
(https://www.ebi.ac.uk/QuickGO/term/GO:0038023)

GO - Biological Process

GO:0006952 : defense response (https://www.ebi.ac.uk/QuickGO/term/GO:0006952)
GO:0008219 : cell death (https://www.ebi.ac.uk/QuickGO/term/GO:0008219)
GO:0009816 : defense response to bacterium, incompatible interaction
(https://www.ebi.ac.uk/QuickGO/term/GO:0009816)
GO:0009626 : plant-type hypersensitive response
(https://www.ebi.ac.uk/QuickGO/term/GO:0009626)

GO - Cellular Component

GO:0005886 : plasma membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0005886)

Presumptive Null

Yes (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Yes^#gephebase-summary-title)

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

Deletion

Experimental Evidence

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

Main Reference

A new Ac-like transposon of Arabidopsis is associated with a deletion of the RPS5 disease resistance gene. (1999) (https://pubmed.ncbi.nlm.nih.gov/10101179)

Authors

Henk AD; Warren RF; Innes RW

Abstract

The RPS5 and RFL1 disease resistance genes of Arabidopsis ecotype Col-0 are oriented in tandem and are separated by 1.4 kb. The Ler-0 ecotype contains RFL1, but lacks RPS5. Sequence analysis of the RPS5 deletion region in Ler-0 revealed the presence of an Ac-like transposable element, which we have designated Tag2. Southern hybridization analysis of six Arabidopsis ecotypes revealed 4-11 Tag2-homologous sequences in each, indicating that this element is ubiquitous in Arabidopsis and has been active in recent evolutionary time. The Tag2 insertion adjacent to RFL1 was unique to the Ler-0 ecotype, however, and was not present in two other ecotypes that lack RPS5. DNA sequence from the latter ecotypes lacked a transposon footprint, suggesting that insertion of Tag2 occurred after the initial deletion of RPS5. The deletion breakpoint contained a 192-bp insertion that displayed hallmarks of a nonhomologous DNA end-joining event. We conclude that loss of RPS5 was caused by a double-strand break and subsequent repair, and cannot be attributed to unequal crossing over between resistance gene homologs.

Additional References

Genome-wide association study of 107 phenotypes in Arabidopsis thaliana inbred lines. (2010) (https://pubmed.ncbi.nlm.nih.gov/20336072)

RELATED GEPHE

Related Genes

20 (ACD6 = ACCELERATED CELL DEATH 6, ERECTA, RAC1, Resistance related Kinase 1 (RKS1), RLM1, RLM2 cluster, RLM3, RPM1, RPP1-WsA, RPP1-WsB, RPP1-WsC, RPP13, RPP2A-RPP2B, RPP4, RPP5, RPP8, RPS2, RPS4, RRS1, WRR4) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^3702^/and+Trait=Pathogen resistance/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

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