GEPHE SUMMARY

Gephebase Gene
SRF3 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^SRF3^#gephebase-summary-title)

GepheID
GP00001073

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

Trait State in Taxon A
Arabidopsis thaliana - Ler and Col (Northern Europe) "compatible"

Trait State in Taxon B
Arabidopsis thaliana - Kond (Central Asia) "incompatible" [Hybrids with Ler show a stong growth defect at 14C)

Ancestral State
Unknown

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 - Ler and Col (Northern Europe) "compatible"

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 - Kond (Central Asia) "incompatible" [Hybrids with Ler show a stong growth defect at 14C)

GENOTYPIC CHANGE

Generic Gene Name
SRF3

Synonyms
F4C21.35; F4C21_35; STRUBBELIG-receptor family 3; At4g03390

String
3702.AT4G03390.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT4G03390.1)

Sequence Similarities
Belongs to the protein kinase superfamily. Ser/Thr protein kinase family.

GO - Molecular Function
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)
GO:0004675 : transmembrane receptor protein serine/threonine kinase activity

UniProtKB Arabidopsis thaliana
Q6R2K3 (http://www.uniprot.org/uniprot/Q6R2K3)

GenebankID or UniProtKB
()

(https://www.ebi.ac.uk/QuickGO/term/GO:0004675)

GO - Biological Process

GO:0006468 : protein phosphorylation
(https://www.ebi.ac.uk/QuickGO/term/GO:0006468)
GO:0007623 : circadian rhythm (https://www.ebi.ac.uk/QuickGO/term/GO:0007623)

GO - Cellular Component

GO:0016021 : integral component of membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0016021)
GO:0005886 : plasma membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0005886)

Presumptive Null

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

Molecular Type

Unknown (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Unknown^#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

Complex haplotype

Experimental Evidence

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

Main Reference

Natural variation at Strubbelig Receptor Kinase 3 drives immune-triggered incompatibilities between Arabidopsis thaliana accessions. (2010) (https://pubmed.ncbi.nlm.nih.gov/21037570)

Authors

AlcÃizar R; GarcÃa AV; Kronholm I; de Meaux J; Koornneef M; Parker JE; Reymond M

Abstract

Accumulation of genetic incompatibilities within species can lead to reproductive isolation and, potentially, speciation. In this study, we show that allelic variation at SRF3 (Strubbelig Receptor Family 3), encoding a receptor-like kinase, conditions the occurrence of incompatibility between Arabidopsis thaliana accessions. The geographical distribution of SRF3 alleles reveals that allelic forms causing epistatic incompatibility with a Landsberg erecta allele at the RPP1 resistance locus are present in A. thaliana accessions in central Asia. Incompatible SRF3 alleles condition for an enhanced early immune response to pathogens as compared to the resistance-dampening effect of compatible SRF3 forms in isogenic backgrounds. Variation in disease susceptibility suggests a basis for the molecular patterns of a recent selective sweep detected at the SRF3 locus in central Asian populations.

Additional References

Analysis of a plant complex resistance gene locus underlying immune-related hybrid incompatibility and its occurrence in nature. (2014) (https://pubmed.ncbi.nlm.nih.gov/25503786)

RELATED GEPHE

Related Genes

2 (AT5G41740/AT5G41750, RPP1) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^3702^/and+Trait=Hybrid Incompatibility/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^SRF3^/and+Taxon ID=^3702^/or+Gene Gephebase=^SRF3^/and+Taxon ID=^3702^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS

@Epistasis - Recessive incompatibility trait ; epistatic interaction with RPP1 resistance locus