

GEPHE SUMMARY

ripening inhibitor (rin) = LeMADS-RIN and LeMADS-MC (<a +ripening+inhibitor+(rin)+lemads-rin+and+lemads-mc`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene Gephebase="ripening inhibitor (rin)</a> = LeMADS-RIN and LeMADS-MC`#gephebase-summary-title)		Gephebase Gene	GepheID
		GP00000990	
		Martin	Main curator
Published		Entry Status	

PHENOTYPIC CHANGE

Physiology (<a +physiology`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait Category="Physiology`#gephebase-summary-title)		Trait Category	
Fruit ripening (<a +fruit+ripening`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="Fruit ripening`#gephebase-summary-title)		Trait	
Solanum lycopersicum domesticated - Ailsa Craig - Rin/Rin		Trait State in Taxon A	
Solanum lycopersicum domesticated - rin/rin		Trait State in Taxon B	
Taxon A		Ancestral State	
Domesticated (<a +domesticated`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic Status="Domesticated`#gephebase-summary-title)		Taxonomic Status	
Taxon A		Taxon B	
Solanum lycopersicum (<a +solanum+lycopersicum`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Solanum lycopersicum`#gephebase-summary-title)		Solanum lycopersicum (<a +solanum+lycopersicum`#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Solanum lycopersicum`#gephebase-summary-title)	
tomato		tomato	
Lycopersicon esculentum var. esculentum; Solanum esculentum; Solanum lycopersicum var. humboldtii; tomato; Lycopersicon esculentum Mill.; Solanum esculentum Dunal; Solanum lycopersicum L.; Lycopersicon lycopersicum; Lycopersicum esculentum; Solanum lycopersicon		Lycopersicon esculentum var. esculentum; Solanum esculentum; Solanum lycopersicum var. humboldtii; tomato; Lycopersicon esculentum Mill.; Solanum esculentum Dunal; Solanum lycopersicum L.; Lycopersicon lycopersicum; Lycopersicum esculentum; Solanum lycopersicon	
species		species	
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Solaneae; Solanum; Lycopersicon		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Solaneae; Solanum; Lycopersicon	
Lycopersicon () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=49274)		Lycopersicon () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=49274)	
4081 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4081)		4081 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4081)	
Yes		Yes	
Solanum lycopersicum domesticated - Ailsa Craig - Rin/Rin		Solanum lycopersicum domesticated - rin/rin	

GENOTYPIC CHANGE

MADS-RIN		Generic Gene Name	
MADS-RIN; LeMADS-RIN; 543708		Q8S4L4 (http://www.uniprot.org/uniprot/Q8S4L4)	
4081.Solyc05g012020.2.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=4081.Solyc05g012020.2.1)		UniProtKB Solanum lycopersicum	
		AF448522 (https://www.ncbi.nlm.nih.gov/nuccore/AF448522)	
		GenebankID or UniProtKB	
		String	
		Sequence Similarities	
		GO - Molecular Function	
GO:0046983 : protein dimerization activity			

(<https://www.ebi.ac.uk/QuickGO/term/GO:0046983>)
GO:0000977 : RNA polymerase II regulatory region sequence-specific DNA binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0000977>)
GO:0043565 : sequence-specific DNA binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043565>)
GO:0008134 : transcription factor binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0008134>)
GO:0000982 : transcription factor activity, RNA polymerase II proximal promoter
sequence-specific DNA binding (<https://www.ebi.ac.uk/QuickGO/term/GO:0000982>)
GO:0044212 : transcription regulatory region DNA binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0044212>)

GO - Biological Process

GO:0007275 : multicellular organism development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0007275>)
GO:0045944 : positive regulation of transcription by RNA polymerase II
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045944>)
GO:0048481 : plant ovule development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048481>)

GO - Cellular Component

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

Deletion Size

1-10 kb

Molecular Details of the Mutation

2.6kb deletion of the region located between gene LeMADS-RIN and gene LeMADS-MC; resulting in a chimeric mRNA that contains both LeMADS-RIN and LeMADS-MC coding regions.

Experimental Evidence

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=))

Main Reference

A MADS-box gene necessary for fruit ripening at the tomato ripening-inhibitor (rin) locus. (2002) (<https://pubmed.ncbi.nlm.nih.gov/11951045>)

Authors

Vrebalov J; Ruezinsky D; Padmanabhan V; White R; Medrano D; Drake R; Schuch W; Giovannoni J

Abstract

Tomato plants harboring the ripening-inhibitor (rin) mutation yield fruits that fail to ripen. Additionally, rin plants display enlarged sepals and loss of inflorescence determinacy. Positional cloning of the rin locus revealed two tandem MADS-box genes (LeMADS-RIN and LeMADS-MC), whose expression patterns suggested roles in fruit ripening and sepal development, respectively. The rin mutation alters expression of both genes. Gene repression and mutant complementation demonstrate that LeMADS-RIN regulates ripening, whereas LeMADS-MC affects sepal development and inflorescence determinacy. LeMADS-RIN demonstrates an agriculturally important function of plant MADS-box genes and provides molecular insight into nonhormonal (developmental) regulation of ripening.

Additional References

Molecular genetic analysis of the ripening-inhibitor and non-ripening loci of tomato: a first step in genetic map-based cloning of fruit ripening genes. (1995) (<https://pubmed.ncbi.nlm.nih.gov/7651343>)

RELATED GEPHE

Related Genes

2 (LeSPL-CNR, PG) ([https://www.gephebase.org/search-criteria?/or+Taxon ID="+4081^/and+Trait=Fruit ripening/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon ID=))

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS