GEPHE SUMMARY

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

GepheID
GP00000337

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

Trait State in Taxon A
Capsella rubella

Trait State in Taxon B
Capsella rubella

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
Capsella rubella (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Capsella rubella^#gephebase-summary-title)

Common Name
-

Synonyms
Capsella rubella Reut.

Rank
species

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

Parent
Capsella () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3718)

NCBI Taxonomy ID
81985 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 81985)

is Taxon A an Infraspecies?
No

Taxon B

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

Common Name
-

Synonyms
Capsella rubella Reut.

Rank
species

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

Parent
Capsella () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3718)

NCBI Taxonomy ID
81985 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 81985)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
FLC

Synonyms
AGAMOUS-like 25; AGL25; FLF; FLOWERING LOCUS C; FLOWERING LOCUS F; MADS BOX PROTEIN FLOWERING LOCUS F; REDUCED STEM BRANCHING 6; RSB6; T31P16.130; T31P16_130; At5g10140

String
3702.AT5G10140.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT5G10140.1)

Sequence Similarities
-

GO - Molecular Function
GO:0046983 : protein dimerization activity (https://www.ebi.ac.uk/QuickGO/term/GO:0046983)
GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)
GO:0000977 : RNA polymerase II regulatory region sequence-specific DNA binding

UniProtKB Arabidopsis thaliana
Q9S7Q7 (http://www.uniprot.org/uniprot/Q9S7Q7)

GenebankID or UniProtKB
AFP49710 (https://www.ncbi.nlm.nih.gov/nuccore/AFP49710)

(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:0030154 : cell differentiation (https://www.ebi.ac.uk/QuickGO/term/GO:0030154)
GO:0009908 : flower development (https://www.ebi.ac.uk/QuickGO/term/GO:0009908)
GO:0009910 : negative regulation of flower development
(https://www.ebi.ac.uk/QuickGO/term/GO:0009910)
GO:0042752 : regulation of circadian rhythm
(https://www.ebi.ac.uk/QuickGO/term/GO:0042752)
GO:0009266 : response to temperature stimulus
(https://www.ebi.ac.uk/QuickGO/term/GO:0009266)
GO:0010048 : vernalization response
(https://www.ebi.ac.uk/QuickGO/term/GO:0010048)

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)

Molecular Type

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

Aberration Type

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

SNP Coding Change

-

Molecular Details of the Mutation

Splice site mutation introducing frameshift; removing the last 35 of 198 amino acids

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Main Reference

Independent FLC mutations as causes of flowering-time variation in Arabidopsis thaliana and Capsella rubella. (2012) (https://pubmed.ncbi.nlm.nih.gov/22865739)

Authors

Guo YL; Todesco M; Hagmann J; Das S; Weigel D

Abstract

Capsella rubella is an inbreeding annual forb closely related to Arabidopsis thaliana, a model species widely used for studying natural variation in adaptive traits such as flowering time. Although mutations in dozens of genes can affect flowering of A. thaliana in the laboratory, only a handful of such genes vary in natural populations. Chief among these are FRIGIDA (FRI) and FLOWERING LOCUS C (FLC). Common and rare FRI mutations along with rare FLC mutations explain a large fraction of flowering-time variation in A. thaliana. Here we document flowering time under different conditions in 20 C. rubella accessions from across the species' range. Similar to A. thaliana, vernalization, long photoperiods and elevated ambient temperature generally promote flowering. In this collection of C. rubella accessions, we did not find any obvious loss-of-function FRI alleles. Using mapping-by-sequencing with two strains that have contrasting flowering behaviors, we identified a splice-site mutation in FLC as the likely cause of early flowering in accession 1408. However, other similarly early C. rubella accessions did not share this mutation. We conclude that the genetic basis of flowering-time variation in C. rubella is complex, despite this very young species having undergone an extreme genetic bottleneck when it split from C. grandiflora a few tens of thousands of years ago.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

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