

GEPHE SUMMARY

	Gephebase Gene		GepheID
FLC-1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^FLC-1^#gephebase-summary-title)	GP00000338		Main curator
Published	Entry Status	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		
Brassica rapa	Trait State in Taxon B		
Brassica rapa	Ancestral State		
Data not curated	Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Domesticated^#gephebase-summary-title)			
	Taxon A		Taxon B
	Latin Name		Latin Name
Brassica rapa (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Brassica+rapa^#gephebase-summary-title)	Common Name		Common Name
field mustard	Synonyms		Synonyms
field mustard; Brassica rapa L.; Brassica rapa L., 1753	Rank		Rank
species	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Brassicaceae; Brassica	Parent		Parent
Brassica () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3705)	NCBI Taxonomy ID		NCBI Taxonomy ID
3711 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3711)	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No			No

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Arabidopsis thaliana
FLC	Synonyms		GenebankID or UniProtKB
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			

(<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

GA substitution disrupting Splice Site

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

A naturally occurring splicing site mutation in the Brassica rapa FLC1 gene is associated with variation in flowering time. (2009) (<https://pubmed.ncbi.nlm.nih.gov/19190098>)

Authors

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Abstract

FLOWERING LOCUS C (FLC), encoding a MADS-domain transcription factor in Arabidopsis, is a repressor of flowering involved in the vernalization pathway. This provides a good reference for Brassica species. Genomes of Brassica species contain several FLC homologues and several of these colocalize with flowering-time QTL. Here the analysis of sequence variation of BrFLC1 in Brassica rapa and its association with the flowering-time phenotype is reported. The analysis revealed that a G-->A polymorphism at the 5' splice site in intron 6 of BrFLC1 is associated with flowering phenotype. Three BrFLC1 alleles with alternative splicing patterns, including two with different parts of intron 6 retained and one with the entire exon 6 excluded from the transcript, were identified in addition to alleles with normal splicing. It was inferred that aberrant splicing of the pre-mRNA leads to loss-of-function of BrFLC1. A CAPS marker was developed for this locus to distinguish Pi6+1(G) and Pi6+1(A). The polymorphism detected with this marker was significantly associated with flowering time in a collection of 121 B. rapa accessions and in a segregating Chinese cabbage doubled-haploid population. These findings suggest that a naturally occurring splicing mutation in the BrFLC1 gene contributes greatly to flowering-time variation in B. rapa.

Additional References

RELATED GEPHE

Related Genes

1 (FLC-2) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=~3711~/and+Trait=Flowering time/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@Splicing