GEPHE SUMMARY

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

GepheID
GP00000367

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
Arabidopsis thaliana- H51

Trait State in Taxon B
Arabidopsis thaliana- PNA-17

Ancestral State
Taxon A

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- H51

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- PNA-17

GENOTYPIC CHANGE

Generic Gene Name
FRI

Synonyms
-

String
-

Sequence Similarities
Belongs to the Frigida family.

GO - Molecular Function
-

GO - Biological Process
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 - Cellular Component
GO:0016607 : nuclear speck (https://www.ebi.ac.uk/QuickGO/term/GO:0016607)

UniProtKB Arabidopsis thaliana
P0DH90 (http://www.uniprot.org/uniprot/P0DH90)

GenebankID or UniProtKB
AF228500 (https://www.ncbi.nlm.nih.gov/nuccore/AF228500)

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

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

Deletion Size

10-99 bp

Molecular Details of the Mutation

deletion of 6 amino acids; LQLDKE422-427*

Experimental Evidence

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

Main Reference

Role of FRIGIDA and FLOWERING LOCUS C in determining variation in flowering time of Arabidopsis. (2005) (https://pubmed.ncbi.nlm.nih.gov/15908596)

Authors

Shindo C; Aranzana MJ; Lister C; Baxter C; Nicholls C; Nordborg M; Dean C

Abstract

Arabidopsis (Arabidopsis thaliana) accessions provide an excellent resource to dissect the molecular basis of adaptation. We have selected 192 Arabidopsis accessions collected to represent worldwide and local variation and analyzed two adaptively important traits, flowering time and vernalization response. There was huge variation in the flowering habit of the different accessions, with no simple relationship to latitude of collection site and considerable diversity occurring within local regions. We explored the contribution to this variation from the two genes FRIGIDA (FRI) and FLOWERING LOCUS C (FLC), previously shown to be important determinants in natural variation of flowering time. A correlation of FLC expression with flowering time and vernalization was observed, but it was not as strong as anticipated due to many late-flowering/vernalization-requiring accessions being associated with low FLC expression and early-flowering accessions with high FLC expression. Sequence analysis of FRI revealed which accessions were likely to carry functional alleles, and, from comparison of flowering time with allelic type, we estimate that approximately 70% of flowering time variation can be accounted for by allelic variation of FRI. The maintenance and propagation of 20 independent nonfunctional FRI haplotypes suggest that the loss-of-function mutations can confer a strong selective advantage. Accessions with a common FRI haplotype were, in some cases, associated with very different FLC levels and wide variation in flowering time, suggesting additional variation at FLC itself or other genes regulating FLC. These data reveal how useful these Arabidopsis accessions will be in dissecting the complex molecular variation that has led to the adaptive phenotypic variation in flowering time.

Additional References

RELATED GEPHE

Related Genes

12 (AGAMOUS-LIKE 50, Cryptochrome 2 (CRY2) EDI allele, EARLY FLOWERING 3(ELF3), FLC (Flowering Locus C), FLM (MAF1), Flowering locus T (FT), Frigida like 1 (FRL1), Frigida like 2 (FRL2), MADS AFFECTING FLOWERING 2 (MAF2), SVP (SHORT VEGETATIVE PHASE), VIN3, HUA2) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^3702^/and+Trait=Flowering time/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

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

EXTERNAL LINKS

COMMENTS