

## GEPHE SUMMARY

VIN3 ( <a href="https://www.gephebase.org/search-criteria/?and+GeneGephebase=^VIN3^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+GeneGephebase=^VIN3^#gephebase-summary-title</a> )	Gephebase Gene	GP00001538	GephelD
	Entry Status	Prigent	Main curator
Published			

## PHENOTYPIC CHANGE

	Trait Category		
Physiology ( <a href="https://www.gephebase.org/search-criteria/?and+TraitCategory=^Physiology^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+TraitCategory=^Physiology^#gephebase-summary-title</a> )		Trait	
Flowering time ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=^Flowering time^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait=^Flowering time^#gephebase-summary-title</a> )		Trait State in Taxon A	
Arabidopsis thaliana ecotype from Italy with early flowering		Trait State in Taxon B	
Arabidopsis thaliana ecotype from Sweden		Ancestral State	
Unknown		Taxonomic Status	
Intraspecific ( <a href="https://www.gephebase.org/search-criteria/?and+TaxonomicStatus=^Intraspecific^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+TaxonomicStatus=^Intraspecific^#gephebase-summary-title</a> )			
Taxon A		Taxon B	
Arabidopsis thaliana ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon and Synonyms=^Arabidopsis thaliana^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon and Synonyms=^Arabidopsis thaliana^#gephebase-summary-title</a> )	Latin Name	Arabidopsis thaliana ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon and Synonyms=^Arabidopsis thaliana^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon and Synonyms=^Arabidopsis thaliana^#gephebase-summary-title</a> )	Latin Name
thale cress	Common Name	thale cress	Common Name
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Synonyms	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viriplantae; Streptophytina; Streptophytina; Embryophytina; Tracheophytina; Euphylophyta; Spermatophytina; Magnoliophytina; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Lineage	cellular organisms; Eukaryota; Viriplantae; Streptophytina; Streptophytina; Embryophytina; Tracheophytina; Euphylophyta; Spermatophytina; Magnoliophytina; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Lineage
Arabidopsis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3701">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3701</a> )	Parent	Arabidopsis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3701">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3701</a> )	Parent
3702 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3702">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3702</a> )	NCBI Taxonomy ID	3702 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3702">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3702</a> )	NCBI Taxonomy ID
is Taxon A an Infraspecies?		is Taxon B an Infraspecies?	
Yes	Taxon A Description	Yes	Taxon B Description
Arabidopsis thaliana ecotype from Italy with early flowering		Arabidopsis thaliana ecotype from Sweden	

## GENOTYPIC CHANGE

VIN3	Generic Gene Name	UniProtKB Arabidopsis thaliana
MSF19.4; MSF19_4; VERNALIZATION INSENSITIVE 3; At5g57380	Synonyms	GenebankID or UniProtKB
3702.AT5G57380.1 ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT5G57380.1">http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT5G57380.1</a> )	String	0
-	Sequence Similarities	
GO:0046872 : metal ion binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0046872">https://www.ebi.ac.uk/QuickGO/term/GO:0046872</a> )	GO - Molecular Function	
GO:0003677 : DNA binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003677">https://www.ebi.ac.uk/QuickGO/term/GO:0003677</a> )	GO - Biological Process	
GO:0009409 : response to cold ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0009409">https://www.ebi.ac.uk/QuickGO/term/GO:0009409</a> )		

GO:0001666 : response to hypoxia (<https://www.ebi.ac.uk/QuickGO/term/GO:0001666>)

GO:0070417 : cellular response to cold

(<https://www.ebi.ac.uk/QuickGO/term/GO:0070417>)

GO:0010048 : vernalization response

(<https://www.ebi.ac.uk/QuickGO/term/GO:0010048>)

GO:0045814 : negative regulation of gene expression, epigenetic

(<https://www.ebi.ac.uk/QuickGO/term/GO:0045814>)

GO:0061087 : positive regulation of histone H3-K27 methylation

(<https://www.ebi.ac.uk/QuickGO/term/GO:0061087>)

GO:0051571 : positive regulation of histone H3-K4 methylation

(<https://www.ebi.ac.uk/QuickGO/term/GO:0051571>)

#### GO - Cellular Component

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

GO:0016607 : nuclear speck (<https://www.ebi.ac.uk/QuickGO/term/GO:0016607>)

GO:0005677 : chromatin silencing complex

(<https://www.ebi.ac.uk/QuickGO/term/GO:0005677>)

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

Unknown (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=%Unknown%#gephebase-summary-title>)

Molecular Details of the Mutation

4 nonsynonymous substitutions and a 3 bp deletion

Experimental Evidence

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

Main Reference

Adaptive divergence in flowering time among natural populations of *Arabidopsis thaliana*: Estimates of selection and QTL mapping. (2017) (<https://pubmed.ncbi.nlm.nih.gov/27859214/>)

Authors

Ågren J; Oakley CG; Lundemo S; Schemske DW

Abstract

To identify the ecological and genetic mechanisms of local adaptation requires estimating selection on traits, identifying their genetic basis, and evaluating whether divergence in adaptive traits is due to conditional neutrality or genetic trade-offs. To this end, we conducted field experiments for three years using recombinant inbred lines (RILs) derived from two ecotypes of *Arabidopsis thaliana* (Italy, Sweden), and at each parental site examined selection on flowering time and mapped quantitative trait loci (QTL). There was strong selection for early flowering in Italy, but weak selection in Sweden. Eleven distinct flowering time QTL were detected, and for each the Italian genotype caused earlier flowering. Twenty-seven candidate genes were identified, two of which (FLC and VIN3) appear under major flowering time QTL in Italy. Seven of eight QTL in Italy with narrow credible intervals colocalized with previously reported fitness QTL, in comparison to three of four in Sweden. The results demonstrate that the magnitude of selection on flowering time differs strikingly between our study populations, that the genetic basis of flowering time variation is multigenic with some QTL of large effect, and suggest that divergence in flowering time between ecotypes is due mainly to conditional neutrality.

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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 (FRI), Frigida like 1 (FRL1), Frigida like 2 (FRL2), MADS AFFECTING FLOWERING 2 (MAF2), SVP (SHORT VEGETATIVE PHASE), HUA2) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=%3702%27/and+Trait=Flowering+time/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS

one of the largest effect QTL among 11 distinct flowering time QTL