

GEPHE SUMMARY

	Gephebase Gene	GephelD
phytochrome C (PHYC) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^phytochrome C (PHYC)^#gephebase-summary-title)	GP00000873	Main curator
	Entry Status	Martin
Published		

PHENOTYPIC CHANGE

	Trait Category	
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)	Trait	
Light sensitivity (https://www.gephebase.org/search-criteria?/and+Trait=^Light sensitivity^#gephebase-summary-title)	Trait State in Taxon A	
Arabidopsis thaliana- Colo	Trait State in Taxon B	
Arabidopsis thaliana- Fr-2	Ancestral State	
Data not curated	Taxonomic Status	
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)		
Taxon A		Taxon B
	Latin Name	Latin Name
Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)		Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)
thale cress	Common Name	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
species	Rank	Rank
cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphylophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Lineage	Lineage
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	Parent	Parent
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	NCBI Taxonomy ID	NCBI Taxonomy ID
Yes	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
Arabidopsis thaliana- Colo	Taxon A Description	Taxon B Description

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Arabidopsis thaliana
PHYC		
	Synonyms	GenebankID or UniProtKB
MIK22.15; MIK22_15; phytochrome C; PHYTOCHROME C; At5g35840		X17343 (https://www.ncbi.nlm.nih.gov/nucleotide/X17343)
3702.AT5G35840.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT5G35840.1)	String	
Belongs to the phytochrome family.	Sequence Similarities	
GO:0042803 : protein homodimerization activity (https://www.ebi.ac.uk/QuickGO/term/GO:0042803)	GO - Molecular Function	
GO:0009881 : photoreceptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0009881)		
	GO - Biological Process	

GO:0006355 : regulation of transcription, DNA-templated
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006355>)

GO:0018298 : protein-chromophore linkage
(<https://www.ebi.ac.uk/QuickGO/term/GO:0018298>)

GO:0009585 : red, far-red light phototransduction
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009585>)

GO:0009584 : detection of visible light
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009584>)

GO:0017006 : protein-tetrapyrrole linkage
(<https://www.ebi.ac.uk/QuickGO/term/GO:0017006>)

GO - Cellular Component

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

Presumptive Null

Yes (<https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^Yes^#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

Nonsense

Molecular Details of the Mutation

K299*; the predicted Fr-2 PHYC protein therefore lacks half of the GAF domain; and the entire PHY; PAS and histidine kinase domains; all of which are typically required for phytochrome function

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

The PHYTOCHROME C photoreceptor gene mediates natural variation in flowering and growth responses of *Arabidopsis thaliana*. (2006) (<https://pubmed.ncbi.nlm.nih.gov/16732287>)

Authors

Balasubramanian S; Sureshkumar S; Agrawal M; Michael TP; Wessinger C; Maloof JN; Clark R; Warthmann N; Chory J; Weigel D

Abstract

Light has an important role in modulating seedling growth and flowering time. We show that allelic variation at the PHYTOCHROME C (PHYC) photoreceptor locus affects both traits in natural populations of *A. thaliana*. Two functionally distinct PHYC haplotype groups are distributed in a latitudinal cline dependent on FRIGIDA, a locus that together with FLOWERING LOCUS C explains a large portion of the variation in *A. thaliana* flowering time. In a genome-wide scan for association of 65 loci with latitude, there was an excess of significant P values, indicative of population structure. Nevertheless, PHYC was the most strongly associated locus across 163 strains, suggesting that PHYC alleles are under diversifying selection in *A. thaliana*. Our work, together with previous findings, suggests that photoreceptor genes are major agents of natural variation in plant flowering and growth response.

Additional References

RELATED GEPHE

Related Genes

2 (phytochrome A (PHYA), phytochrome B (PHYB)) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=^3702^/and+Trait=Light+sensitivity/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS