

GEPHE SUMMARY

	Gephebase Gene		GepheID
phytochrome C (PHYC) (https://www.gephebase.org/search-criteria?/and+Gene)		GP00000873	
Gephebase=^phytochrome C (PHYC)^#gephebase-summary-title)			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- Col0			
	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		Arabidopsis thaliana	
(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Arabidopsis		(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Arabidopsis	
thaliana^#gephebase-summary-title)		thaliana^#gephebase-summary-title)	
	Common Name		Common Name
thale cress		thale cress	
	Synonyms		Synonyms
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis		thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis	
thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress		thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta;		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta;	
Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae;		Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae;	
eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae;		eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae;	
Camelineae; Arabidopsis		Camelineae; Arabidopsis	
	Parent		Parent
Arabidopsis () - (Rank: genus)		Arabidopsis () - (Rank: genus)	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
3702		3702	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
Yes		Yes	
	Taxon A Description		Taxon B Description
Arabidopsis thaliana- Col0		Arabidopsis thaliana- Fr-2	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Arabidopsis thaliana
PHYC		P14714 (http://www.uniprot.org/uniprot/P14714)	
	Synonyms		GenebankID or UniProtKB
MIK22.15; MIK22_15; phytochrome C; PHYTOCHROME C; At5g35840		X17343 (https://www.ncbi.nlm.nih.gov/nuccore/X17343)	
	String		
3702.AT5G35840.1			
(http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT5G35840.1)			
	Sequence Similarities		
Belongs to the phytochrome family.			
	GO - Molecular Function		
GO:0042803 : protein homodimerization activity			
(https://www.ebi.ac.uk/QuickGO/term/GO:0042803)			
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