

GEPHE SUMMARY

HUA2 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~HUA2^#gephebase-summary-title)	Gephebase Gene	GP00001230	GepheID
Published	Entry Status	Arnoult	Main curator

PHENOTYPIC CHANGE

Trait #1	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- Ler0	Trait State in Taxon B
Arabidopsis thaliana- Eri-1	

Trait #2	Trait Category
Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology^#gephebase-summary-title)	Trait
Coloration (temperature-dependent) (https://www.gephebase.org/search-criteria?/and+Trait=~Coloration+(temperature-dependent)^#gephebase-summary-title)	Trait State in Taxon A
-	Trait State in Taxon B
-	

Taxon A	Ancestral State
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intraspecific^#gephebase-summary-title)	Taxonomic Status

Taxon A	Taxon B
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	thale cress
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis...thaliana; Arbisopsis thaliana; thale kress	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis...thaliana; Arbisopsis thaliana; thale kress
species	species
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)
Yes	Yes
is Taxon A an Intraspecies?	is Taxon B an Intraspecies?
Arabidopsis thaliana- Ler0	Arabidopsis thaliana- Eri-1

Taxon A	Taxon B
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	thale cress
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis...thaliana; Arbisopsis thaliana; thale kress	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis...thaliana; Arbisopsis thaliana; thale kress
species	species
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)
Yes	Yes
is Taxon A an Intraspecies?	is Taxon B an Intraspecies?
Arabidopsis thaliana- Ler0	Arabidopsis thaliana- Eri-1

GENOTYPIC CHANGE

HUA2	Generic Gene Name	Q9XER9 (http://www.uniprot.org/uniprot/Q9XER9)	UniProtKB Arabidopsis thaliana
ENHANCER OF AG-4 2; MYJ24.14; MYJ24_14; ART1; At5g23150; MKD15	Synonyms	832379 (https://www.ncbi.nlm.nih.gov/nucore/832379)	GenebankID or UniProtKB
3702.AT5G23150.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT5G23150.1)	String		
-	Sequence Similarities		
GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)	GO - Molecular Function		
GO:0043481 : anthocyanin accumulation in tissues in response to UV light (https://www.ebi.ac.uk/QuickGO/term/GO:0043481)	GO - Biological Process		
GO:0030154 : cell differentiation (https://www.ebi.ac.uk/QuickGO/term/GO:0030154)			
GO:0009910 : negative regulation of flower development (https://www.ebi.ac.uk/QuickGO/term/GO:0009910)			
GO:0048497 : maintenance of floral organ identity (https://www.ebi.ac.uk/QuickGO/term/GO:0048497)			
GO:0006397 : mRNA processing (https://www.ebi.ac.uk/QuickGO/term/GO:0006397)			
GO:0048510 : regulation of timing of transition from vegetative to reproductive phase (https://www.ebi.ac.uk/QuickGO/term/GO:0048510)			
GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)	GO - Cellular Component		
Yes (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Yes~#gephebase-summary-title)			Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding~#gephebase-summary-title)			Molecular Type
Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Unknown~#gephebase-summary-title)			Aberration Type
Premature stop codon resulting in truncation of 290 C-terminal amino-acids (hua-2-5 Ler allele)			Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title)			Experimental Evidence
Natural variation for anthocyanin accumulation under high-light and low-temperature stress is attributable to the ENHANCER OF AG-4 2 (HUA2) locus in combination with PRODUCTION OF ANTHOCYANIN PIGMENT1 (PAP1) and PAP2. (2015) (https://pubmed.ncbi.nlm.nih.gov/25425527)			Main Reference
Ilk N; Ding J; Ihnatowicz A; Koornneef M; Reymond M			Authors
Growing conditions combining high light intensities and low temperatures lead to anthocyanin accumulation in plants. This response was contrasted between two Arabidopsis thaliana accessions, which were used to decipher the genetic and molecular bases underlying the variation of this response. Quantitative trait loci (QTLs) for flowering time (FT) and anthocyanin accumulation under a high-light and low-temperature scenario versus a control environment were mapped. Major QTLs were confirmed using near-isogenic lines. Candidate genes were examined using mutants and gene expression studies as well as transgenic complementation. Several QTLs were found for FT and for anthocyanin content, of which one QTL co-located at the ENHANCER OF AG-4 2 (HUA2) locus. That HUA2 is a regulator of both pathways was confirmed by the analysis of loss-of-function mutants. For a strong expression of anthocyanin, additional allelic variation was detected for the PRODUCTION OF ANTHOCYANIN PIGMENT1 (PAP1) and PAP2 genes which control the anthocyanin pathway. The genetic control of variation for anthocyanin content was dissected in A. thaliana and shown to be affected by a common regulator of flowering and anthocyanin biosynthesis together with anthocyanin-specific regulators.			Abstract
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HUA2 is required for the expression of floral repressors in Arabidopsis thaliana. (2005) (https://pubmed.ncbi.nlm.nih.gov/15659097)			Additional References

RELATED GEPHE

15 (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), VIN3, PAP1, PAP2, phytochrome D (PHYD)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=~3702~/and+Trait=Flowering time/or+Taxon ID=~3702~/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~HUA2~/and+Taxon ID=~3702~/or+Gene Gephebase=~HUA2~/and+Taxon ID=~3702~#gephebase-summary-title)	Related Haplotypes

EXTERNAL LINKS

COMMENTS

other FT QTLs confirmed in the study ; high-light and low-temperature stress