

GEPHE SUMMARY

PAP2 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=PAP2^#gephebase-summary-title)	Gephebase Gene	GP00001231	GepheID
	Entry Status	Arnoult	Main curator
	Published		

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=Physiology^#gephebase-summary-title)		Trait Category	
Coloration (anthocyanin accumulation under high-light and low-temperature stress) (https://www.gephebase.org/search-criteria?/and+Trait=Coloration (anthocyanin accumulation under high-light and low-temperature stress)^#gephebase-summary-title)		Trait	
Arabidopsis thaliana- Ler0		Trait State in Taxon A	
Arabidopsis thaliana- Eri-1		Trait State in Taxon B	
Data not curated		Ancestral State	
Intraspecific (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=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; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; 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	
Arabidopsis thaliana- Ler0		Arabidopsis thaliana- Eri-1	

GENOTYPIC CHANGE

MYB90		Generic Gene Name	UniProtKB Arabidopsis thaliana
ATMYB90; myb domain protein 90; PAP2; PRODUCTION OF ANTHOCYANIN PIGMENT 2; T27F4.14; T27F4.14; At1g66390		Synonyms	GenebankID or UniProtKB
3702.AT1G66390.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT1G66390.1)		String	
-		Sequence Similarities	
GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)		GO - Molecular Function	

GO:0043565 : sequence-specific DNA binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043565>)
GO:0044212 : transcription regulatory region DNA binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0044212>)

GO - Biological Process

GO:0006355 : regulation of transcription, DNA-templated
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006355>)
GO:0030154 : cell differentiation (<https://www.ebi.ac.uk/QuickGO/term/GO:0030154>)
GO:0080167 : response to karrikin (<https://www.ebi.ac.uk/QuickGO/term/GO:0080167>)

GO - Cellular Component

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

Presumptive Null

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

one SNP in the coding region and several in the putative promoter region

Experimental Evidence

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

Main Reference

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>)

Authors

Ilk N; Ding J; Ihnatowicz A; Koornneef M; Reymond M

Abstract

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.

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Additional References

RELATED GEPHE

Related Genes

3 (HUA2, PAP1, phytochrome D (PHYD)) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=~3702~/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

poor mutational resolution ; high-light and low-temperature stress