

GEPHE SUMMARY

flavonoid 3';5'-hydroxylase (F3'5'H) (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~flavonoid 3';5'-hydroxylase (F3'5'H)^#gephebase-summary-title)	Gephebase Gene		GepheID
	GP00000325		
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

		Trait Category	
Morphology (https://www.gephebase.org/search-criteria?/and+TraitCategory=~Morphology^#gephebase-summary-title)		Trait	
Coloration (flowers) (https://www.gephebase.org/search-criteria?/and+Trait=~Coloration (flowers)^#gephebase-summary-title)		Trait State in Taxon A	
Phlox drummondi - Light-colored flowers		Trait State in Taxon B	
Phlox drummondi - Dark-colored flowers		Ancestral State	
Data not curated		Taxonomic Status	
Intraspecific (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=~Intraspecific^#gephebase-summary-title)			
Taxon A		Taxon B	
Phlox drummondii		Phlox drummondii	
(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Phlox drummondii^#gephebase-summary-title)		(https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=~Phlox drummondii^#gephebase-summary-title)	
Common Name		Common Name	
-		-	
Synonyms		Synonyms	
Phlox drummondii Hook.; Phlox drummondi		Phlox drummondii Hook.; Phlox drummondi	
Rank		Rank	
species		species	
Lineage		Lineage	
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; Ericales; Polemoniaceae; Phlox		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; Ericales; Polemoniaceae; Phlox	
Parent		Parent	
Phlox (phloxes) - (Rank: genus)		Phlox (phloxes) - (Rank: genus)	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 40749)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 40749)	
NCBI Taxonomy ID		NCBI Taxonomy ID	
103529		103529	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 103529)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 103529)	
is Taxon A an Intraspecies?		is Taxon B an Intraspecies?	
No		No	

GENOTYPIC CHANGE

		Generic Gene Name	
CYP75A2		P37120 (http://www.uniprot.org/uniprot/P37120)	
CYP75; CYPEG1		GenebankID or UniProtKB	
AFD05068 (https://www.ncbi.nlm.nih.gov/nuccore/AFD05068)		String	
-		Sequence Similarities	
Belongs to the cytochrome P450 family.		GO - Molecular Function	
GO:0020037 : heme binding (https://www.ebi.ac.uk/QuickGO/term/GO:0020037)		UniProtKB Solanum melongena	
GO:0005506 : iron ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005506)			
GO:0004497 : monooxygenase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004497)			
GO:0016705 : oxidoreductase activity, acting on paired donors, with incorporation or reduction of molecular oxygen (https://www.ebi.ac.uk/QuickGO/term/GO:0016705)			
GO - Biological Process			
GO:0009718 : anthocyanin-containing compound biosynthetic process (https://www.ebi.ac.uk/QuickGO/term/GO:0009718)			
GO - Cellular Component			

-	Presumptive Null
Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Unknown^#gephebase-summary-title)	
	Molecular Type
Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Cis-regulatory^#gephebase-summary-title)	
	Aberration Type
Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Unknown^#gephebase-summary-title)	
unknown	Molecular Details of the Mutation
	Experimental Evidence
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping^#gephebase-summary-title)	
	Main Reference
Identification of two genes causing reinforcement in the Texas wildflower <i>Phlox drummondii</i> . (2011) (https://pubmed.ncbi.nlm.nih.gov/21217687)	
	Authors
Hopkins R; Rausher MD	
	Abstract
Species formation generates biological diversity and occurs when traits evolve that prevent gene flow between populations. Discerning the number and distribution of genes underlying these traits and, in a few cases, identifying the genes involved, has greatly enhanced our understanding over the past 15 years of species formation (reviewed by Noor and Feder and Wolf et al.). However, this work has almost exclusively focused on traits that restrict gene flow between populations that have evolved as a by-product of genetic divergence between geographically isolated populations. By contrast, little is known about the characteristics of genes associated with reinforcement, the process by which natural selection directly favours restricted gene flow during the formation of species. Here we identify changes in two genes that appear to cause a flower colour change in <i>Phlox drummondii</i>, which previous work has shown contributes to reinforcement. Both changes involve cis-regulatory mutations to genes in the anthocyanin biosynthetic pathway (ABP). Because one change is recessive whereas the other is dominant, hybrid offspring produce an intermediate flower colour that is visited less by pollinators, and is presumably maladaptive. Thus genetic change selected to increase prezygotic isolation also appears to result in increased postzygotic isolation.	
	Additional References

RELATED GEPHE

	Related Genes
1 (R2R3-Myb) (https://www.gephebase.org/search-criteria?/or+Taxon ID=~103529^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)	
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS