

GEPHE SUMMARY

		Gephebase Gene		GepheID
anthocyanin2 (an2) (https://www.gephebase.org/search-criteria?/and+Gene)			GP00000089	
Gephebase= [^] anthocyanin2 (an2) [^] #gephebase-summary-title)				Main curator
		Entry Status	Martin	
Published				

PHENOTYPIC CHANGE

		Trait Category	
Morphology (https://www.gephebase.org/search-criteria?/and+Trait)			
Category= [^] Morphology [^] #gephebase-summary-title)		Trait	
Coloration (flowers) (https://www.gephebase.org/search-criteria?/and+Trait)			
(flowers) [^] #gephebase-summary-title)		Trait State in Taxon A	
Petunia integrifolia		Trait State in Taxon B	
Petunia axillaris		Ancestral State	
Taxon A		Taxonomic Status	
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic)			
Status= [^] Intraspecific [^] #gephebase-summary-title)			

Taxon A	Latin Name	Taxon B	Latin Name
Petunia integrifolia (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms= [^] Petunia integrifolia [^] #gephebase-summary-title)		Petunia axillaris (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms= [^] Petunia axillaris [^] #gephebase-summary-title)	
-	Common Name	-	Common Name
	Synonyms		Synonyms
violet-flowered petunia; Petunia integrifolia (Hook.) Schinz & Thell., 1915		large white petunia; white moon petunia; Petunia axillaris (Lam.) Britton, Stern & Poggenb.;	
species	Rank	Petunia axillaris	Rank
	Lineage	species	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Petunioidae; Petunia		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Petunioidae; Petunia	
Petunia () - (Rank: genus)	Parent	Petunia () - (Rank: genus)	Parent
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4101)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4101)	
4103	NCBI Taxonomy ID	33119	NCBI Taxonomy ID
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4103)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33119)	
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

		Generic Gene Name		UniProtKB Petunia integrifolia
AN2			A4GRU8 (http://www.uniprot.org/uniprot/A4GRU8)	
		Synonyms		GenebankID or UniProtKB
-			AAF66734 (https://www.ncbi.nlm.nih.gov/nucleotide/AAF66734)	
		String		
-				
		Sequence Similarities		
-				
		GO - Molecular Function		
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)				
		GO - Biological Process		
-				
		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

Deletion (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=~Deletion^#gephebase-summary-title>)

Deletion Size

1-9 bp

Molecular Details of the Mutation

1bp deletion at a.a. 127; premature stop

Experimental Evidence

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

Main Reference

Molecular analysis of the anthocyanin2 gene of petunia and its role in the evolution of flower color. (1999) (<https://pubmed.ncbi.nlm.nih.gov/10449578>)

Authors

Quattrocchio F; Wing J; van der Woude K; Souer E; de Vetten N; Mol J; Koes R

Abstract

The shape and color of flowers are important for plant reproduction because they attract pollinators such as insects and birds. Therefore, it is thought that alterations in these traits may result in the attraction of different pollinators, genetic isolation, and ultimately, (sympatric) speciation. *Petunia integrifolia* and *P. axillaris* bear flowers with different shapes and colors that appear to be visited by different insects. The anthocyanin2 (an2) locus, a regulator of the anthocyanin biosynthetic pathway, is the main determinant of color differences. Here, we report an analysis of molecular events at the an2 locus that occur during *Petunia* spp evolution. We isolated an2 by transposon tagging and found that it encodes a MYB domain protein, indicating that it is a transcription factor. Analysis of *P. axillaris* subspecies with white flowers showed that they contain an2(-) alleles with two alternative frameshifts at one site, apparently caused by the insertion and subsequent excision of a transposon. A third an2(-) allele has a nonsense mutation elsewhere, indicating that it arose independently. The distribution of polymorphisms in an2(-) alleles suggests that the loss of an2 function and the consequent changes in floral color were not the primary cause for genetic separation of *P. integrifolia* and *P. axillaris*. Rather, they were events that occurred late in the speciation process, possibly to reinforce genetic isolation and complete speciation.

Additional References

RELATED GEPHE

Related Genes

1 (MYB-FL) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=~4103^/and+Trait=Coloration/or+Taxon+ID=~33119^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

5 ([https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=~anthocyanin2+\(an2\)^/and+Taxon+ID=~4103^/or+Gene+Gephebase=~anthocyanin2+\(an2\)^/and+Taxon+ID=~33119^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=~anthocyanin2+(an2)^/and+Taxon+ID=~4103^/or+Gene+Gephebase=~anthocyanin2+(an2)^/and+Taxon+ID=~33119^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS