

GEPHE SUMMARY

	Gephebase Gene	GepheID
anthocyanin2 (an2) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase="anthocyanin2 (an2)"#gephebase-summary-title)	GP00000090	
	Entry Status	Main curator
Published	Martin	

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

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Petunia integrifolia
AN2	A4GRU8 (http://www.uniprot.org/uniprot/A4GRU8)	
	Synonyms	GenebankID or UniProtKB
-		
	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 (#gephebase-summary-title)		
	Molecular Type	

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type=%27Coding%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular%20Type=%27Coding%27#gephebase-summary-title))

Aberration Type

Insertion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=%27Insertion%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration%20Type=%27Insertion%27#gephebase-summary-title))

Insertion Size

1-9 bp

Molecular Details of the Mutation

4bp insertion at a.a. 127; premature stop

Experimental Evidence

Candidate Gene ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%27Candidate Gene%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental%20Evidence=%27Candidate%20Gene%27#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=%274103%27/and+Trait=Coloration/or+Taxon ID=%2733119%27/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon%20ID=%274103%27/and+Trait=Coloration/or+TaxonID=%2733119%27/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

5 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=%27anthocyanin2 \(an2\)%27/and+Taxon ID=%274103%27/or+Gene Gephebase=%27anthocyanin2 \(an2\)%27/and+Taxon ID=%2733119%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene%20Gephebase=%27anthocyanin2%20(an2)%27/and+Taxon%20ID=%274103%27/or+Gene%20Gephebase=%27anthocyanin2%20(an2)%27/and+TaxonID=%2733119%27#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS