

GEPHE SUMMARY

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

PHENOTYPIC CHANGE

Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category= [^] Morphology [^] #gephebase-summary-title)	Trait Category		
Coloration (flowers) (https://www.gephebase.org/search-criteria?/and+Trait = [^] Coloration (flowers) [^] #gephebase-summary-title)	Trait		
Petunia integrifolia	Trait State in Taxon A		
Petunia axillaris	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
Petunia integrifolia (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms= [^] Petunia integrifolia [^] #gephebase-summary-title)	Latin Name	Petunia axillaris (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms= [^] Petunia axillaris [^] #gephebase-summary-title)	Latin Name
-	Common Name	-	Common Name
violet-flowered petunia; Petunia integrifolia (Hook.) Schinz & Thell., 1915	Synonyms	large white petunia; white moon petunia; Petunia axillaris (Lam.) Britton, Stern & Poggenb.;	Synonyms
species	Rank	Petunia axillaris	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Petunioideae; Petunia	Lineage	species	Lineage
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
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

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

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

Aberration Type

Insertion (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=~Insertion^#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=~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