

GEPHE SUMMARY

		Gephebase Gene		GepheID
anthocyanin2 (an2) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase= [^] anthocyanin2 (an2) [^] #gephebase-summary-title)			GP00000092	
Published		Entry Status	Martin	Main curator

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 (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	
	Parent		Parent
Petunia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4101)		Petunia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4101)	
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

		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; premature stop

Experimental Evidence

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

Main Reference

Single gene-mediated shift in pollinator attraction in *Petunia*. (2007) (<https://pubmed.ncbi.nlm.nih.gov/17337627>)

Authors

Hoballah ME; GÃ¼lbitz T; Stuurman J; Broger L; Barone M; Mandel T; Dell'Olivo A; Arnold M; Kuhlemeier C

Abstract

Animal-mediated pollination is essential in plant reproductive biology and is often associated with pollination syndromes, sets of floral traits, such as color, scent, shape, or nectar content. Selection by pollinators is often considered a key factor in floral evolution and plant speciation. Our aim is the identification and characterization of the genetic changes that caused the evolution of divergent pollination syndromes in closely related plant species. We focus on ANTHOCYANIN2 (AN2), a well-defined myb-type transcription factor that is a major determinant of flower color variation between *Petunia integrifolia* and *Petunia axillaris*. Analysis of sequence variation in AN2 in wild *P. axillaris* accessions showed that loss-of-function alleles arose at least five times independently. DNA sequence analysis was complemented by functional assays for pollinator preference using genetic introgressions and transgenics. These results show that AN2 is a major determinant of pollinator attraction. Therefore, changes in a single gene cause a major shift in pollination biology and support the notion that the adaptation of a flowering plant to a new pollinator type may involve a limited number of genes of large effect. Gene identification and analysis of molecular evolution in combination with behavioral and ecological studies can ultimately unravel the evolutionary genetics of pollination syndromes.

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