

## GEPHE SUMMARY

**Gephebase Gene**  
anthocyanin2 (an2)

**Entry Status**  
Published

**GepheID**  
GP00000094

**Main curator**  
Martin

## PHENOTYPIC CHANGE

**Trait Category**  
Morphology

**Trait**  
Coloration (flowers)

**Trait State in Taxon A**  
Petunia integrifolia

**Trait State in Taxon B**  
Petunia axillaris

**Ancestral State**  
Data not curated

**Taxonomic Status**  
Interspecific

### Taxon A

**Latin Name**  
*Petunia integrifolia*

**Common Name**  
-

**Synonyms**  
violet-flowered petunia; *Petunia integrifolia* (Hook.) Schinz & Thell., 1915

**Rank**  
species

**Lineage**  
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; asterids; lamiids; Solanales; Solanaceae; Petunioideae; Petunia

**Parent**  
*Petunia* () - (Rank: genus)

**NCBI Taxonomy ID**  
4103

**is Taxon A an Intraspecies?**  
No

### Taxon B

**Latin Name**  
*Petunia axillaris*

**Common Name**  
-

**Synonyms**  
large white petunia; white moon petunia; *Petunia axillaris* (Lam.) Britton, Stern & Poggenb.; *Petunia axillaris*

**Rank**  
species

**Lineage**  
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; asterids; lamiids; Solanales; Solanaceae; Petunioideae; Petunia

**Parent**  
*Petunia* () - (Rank: genus)

**NCBI Taxonomy ID**  
33119

**is Taxon B an Intraspecies?**  
No

## GENOTYPIC CHANGE

**Generic Gene Name**  
AN2

**Synonyms**  
-

**String**  
-

**Sequence Similarities**  
-

**GO - Molecular Function**  
GO:0003677 : DNA binding

**GO - Biological Process**  
-

**GO - Cellular Component**  
GO:0005634 : nucleus

**Presumptive Null**  
Yes

**UniProtKB** *Petunia integrifolia*  
A4GRU8

**GenebankID or UniProtKB**  
AAF66734

#### Molecular Type

Coding

#### Aberration Type

SNP

#### SNP Coding Change

Nonsense

#### Molecular Details of the Mutation

1 aa substitution; premature stop

#### Experimental Evidence

Candidate Gene

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

#### Main Reference

Single gene-mediated shift in pollinator attraction in *Petunia*. (2007)

#### Authors

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

#### Related Haplotypes

5

## EXTERNAL LINKS

## COMMENTS