

## GEPHE SUMMARY

**Gephebase Gene**  
anthocyanin2 (an2)

**Entry Status**  
Published

**GepheID**  
GP00000089

**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**  
Taxon A

**Taxonomic Status**  
Intraspecific

### 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

[Deletion](#)

#### Deletion Size

1-9 bp

#### Molecular Details of the Mutation

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

#### Experimental Evidence

[Candidate Gene](#)

#### Main Reference

[Molecular analysis of the anthocyanin2 gene of petunia and its role in the evolution of flower color. \(1999\)](#)

#### 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 \(MYB-FL\)](#)

#### Related Haplotypes

[5](#)

## COMMENTS