GEPHE SUMMARY

Gephebase Gene
WDR1

GepheID
GP00002093

Entry Status
Published

Main curator
Courtier

PHENOTYPIC CHANGE

Trait Category
Morphology

Trait
Coloration (flowers)

Trait State in Taxon A
Petunia axillaris

Trait State in Taxon B
Petunia axillaris - white flowers with red and pink revertant spots

Ancestral State
Taxon A

Taxonomic Status
Domesticated

Taxon A

Latin Name
Petunia axillaris

Common Name
-

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

Rank
species

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

Parent
Petunia () - (Rank: genus)

NCBI Taxonomy ID
33119

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Petunia axillaris

Common Name
-

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

Rank
species

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

Parent
Petunia () - (Rank: genus)

NCBI Taxonomy ID
33119

is Taxon B an Infraspecies?
Yes

Taxon B Description
petunia line W138

GENOTYPIC CHANGE

Generic Gene Name
InWDR1

Synonyms
InWDR1

String
-

Sequence Similarities
-

GO - Molecular Function
-

GO - Biological Process
-

GO - Cellular Component
-

UniProtKB Ipomoea nil
Q1JUZ7

GenebankID or UniProtKB

Presumptive Null
Yes

Molecular Type
Coding

Aberration Type
Insertion

Insertion Size
100-999 bp

Molecular Details of the Mutation
insertion of a 300-bp dTph1 transposon in the WDR gene in the first WD-repeat (321-bp downstream of the transcription start site)

Experimental Evidence
Candidate Gene

Main Reference
The an11 locus controlling flower pigmentation in petunia encodes a novel WD-repeat protein conserved in yeast, plants, and animals. (1997)

Authors
de Vetten N; Quattrocchio F; Mol J; Koes R

Abstract
In petunia flowers, the loci an1, an2, and an11 control the pigmentation of the flower by stimulating the transcription of anthocyanin biosynthetic genes. The an1 and an2 locus were recently cloned and encode a basic helix-loop-helix (bHLH) and MYB-domain transcriptional activator, respectively. Here, we report the isolation of the an11 locus by transposon tagging. RNA gel blot experiments show that an11 is expressed independently from an1 and an2 throughout plant development, as well as in tissues that do not express the anthocyanin pathway. It encodes a novel WD-repeat protein that is highly conserved even in species that do not produce anthocyanins such as yeast, nematodes, and mammals. The observation that the human an11 homolog partially complements the an11 petunia mutant in transient assays shows that sequence similarity reflects functional conservation. Overexpression of an2 in an11- petals restored the activity of a structural anthocyanin gene in transient assays, indicating that AN11 acts upstream of AN2. Cell fractionation experiments show that the bulk of the AN11 protein is localized in the cytoplasm. Taken together, this indicates that AN11 is a cytoplasmic component of a conserved signal transduction cascade that modulates AN2 function in petunia, thereby linking cellular signals with transcriptional activation.

Additional References

RELATED GEPHE

Related Genes
3 (anthocyanin2 (an2), MYB-FL, bHLH2)
Related Haplotypes
No matches found.

COMMENTS

@TE - WDR1 is also named WDR and anthocyanin11 (an11).