GEPHE SUMMARY

Gephebase Gene

bHLH2 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^bHLH2^#gephebase-summary-title)

GepheID

GP00002092

Entry Status

Published

Main curator

Courtier

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 axillaris

Trait State in Taxon B

Petunia axillaris - white flowers with red and pink revertant spots

Ancestral State

Taxon A

Taxonomic Status

Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Domesticated^#gephebase-summary-title)

Taxon A

Latin Name

Petunia axillaris (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Petunia axillaris^#gephebase-summary-title)

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) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4101)

NCBI Taxonomy ID

33119 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 33119)

is Taxon A an Infraspecies?

No

Taxon B

Latin Name

Petunia axillaris (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Petunia axillaris^#gephebase-summary-title)

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) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4101)

NCBI Taxonomy ID

33119 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 33119)

is Taxon B an Infraspecies?

Yes

Taxon B Description

petunia line W138

GENOTYPIC CHANGE

Generic Gene Name

BHLH2

Synonyms

AtEGL3; ATMYC-2; EGL1; ENHANCER OF GLABRA 3; F24D7.16; F24D7_16; EGL3; EN30; MYC146; At1g63650

String

3702.AT1G63650.3 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT1G63650.3)

Sequence Similarities

-

GO - Molecular Function

GO:0046983 : protein dimerization activity (https://www.ebi.ac.uk/QuickGO/term/GO:0046983)
GO:0003700 : DNA-binding transcription factor activity

UniProtKB Arabidopsis thaliana

Q9CAD0 (http://www.uniprot.org/uniprot/Q9CAD0)

GenebankID or UniProtKB

()

(https://www.ebi.ac.uk/QuickGO/term/GO:0003700)
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)

GO - Biological Process

GO:0007275 : multicellular organism development
(https://www.ebi.ac.uk/QuickGO/term/GO:0007275)
GO:0006355 : regulation of transcription, DNA-templated
(https://www.ebi.ac.uk/QuickGO/term/GO:0006355)
GO:0009867 : jasmonic acid mediated signaling pathway
(https://www.ebi.ac.uk/QuickGO/term/GO:0009867)
GO:0009957 : epidermal cell fate specification
(https://www.ebi.ac.uk/QuickGO/term/GO:0009957)
GO:0010026 : trichome differentiation
(https://www.ebi.ac.uk/QuickGO/term/GO:0010026)

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

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

Insertion Size

-

Molecular Details of the Mutation

insertion of a dTph1 transposon in the AN1 gene

Experimental Evidence

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

Main Reference

ANTHOCYANIN1 of petunia controls pigment synthesis, vacuolar pH, and seed coat development by genetically distinct mechanisms. (2002) (https://pubmed.ncbi.nlm.nih.gov/12215510)

Authors

Spelt C; Quattrocchio F; Mol J; Koes R

Abstract

ANTHOCYANIN1 (AN1) of petunia is a transcription factor of the basic helix-loop-helix (bHLH) family that is required for the synthesis of anthocyanin pigments. Here, we show that AN1 controls additional aspects of cell differentiation: the acidification of vacuoles in petal cells, and the size and morphology of cells in the seed coat epidermis. We identified an1 alleles, formerly known as ph6, that sustain anthocyanin synthesis but not vacuolar acidification and seed coat morphogenesis. These alleles express truncated proteins lacking the C-terminal half of AN1, including the bHLH domain, at an approximately 30-fold higher level than wild-type AN1. An allelic series in which one, two, or three amino acids were inserted into the bHLH domain indicated that this domain is required for both anthocyanin synthesis and vacuolar acidification. These findings show that AN1 controls more aspects of epidermal cell differentiation than previously thought through partially separable domains.

Additional References

RELATED GEPHE

Related Genes

3 (anthocyanin2 (an2), MYB-FL, WDR1) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^33119^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@TE - bHLH2 is also named anthocyanin1 (an1).