GEPHE SUMMARY

Gephebase Gene
flavonoid 3′-hydroxylase (F3′H) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^flavonoid 3′-hydroxylase (F3′H)^#gephebase-summary-title)

GepheID
GP00000320

Entry Status
Published

Main curator
Martin

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 hybrida

Trait State in Taxon B
Petunia hybrida

Ancestral State
Data not curated

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

Taxon A

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

Common Name
-

Synonyms
Petunia axillaris X Petunia integrifolia; Petunia hybrida; garden petunia; Petunia x hybrida hort. ex E.Vilm., 1863

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
4102 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4102)

is Taxon A an Infraspecies?
No

Taxon B

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

Common Name
-

Synonyms
Petunia axillaris X Petunia integrifolia; Petunia hybrida; garden petunia; Petunia x hybrida hort. ex E.Vilm., 1863

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
4102 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4102)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
CYP75B1

Synonyms
CYP75B1; CYTOCHROME P450 75B1; D501; F13G24.190; F13G24_190; F3′H; FLAVONOID 3′-HYDROXYLASE; TRANSPARENT TESTA 7; TT7; At5g07990

String
3702.AT5G07990.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT5G07990.1)

Sequence Similarities
Belongs to the cytochrome P450 family.

GO - Molecular Function
GO:0020037 : heme binding (https://www.ebi.ac.uk/QuickGO/term/GO:0020037)
GO:0005506 : iron ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005506)
GO:0016709 : oxidoreductase activity, acting on paired donors, with incorporation or reduction of molecular oxygen, NAD(P)H as one donor, and incorporation of one atom of oxygen (https://www.ebi.ac.uk/QuickGO/term/GO:0016709)

UniProtKB Arabidopsis thaliana
Q9SD85 (http://www.uniprot.org/uniprot/Q9SD85)

GenebankID or UniProtKB
AAD56282 (https://www.ncbi.nlm.nih.gov/nuccore/AAD56282)

GO - Biological Process

GO:0009733 : response to auxin (https://www.ebi.ac.uk/QuickGO/term/GO:0009733)
GO:0009813 : flavonoid biosynthetic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0009813)

GO - Cellular Component

GO:0016021 : integral component of membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0016021)
GO:0016020 : membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016020)
GO:0005789 : endoplasmic reticulum membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0005789)

Presumptive Null

Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Unknown^#gephebase-summary-title)

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

Not identified

Experimental Evidence

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

Main Reference

Isolation and characterization of a flavonoid 3'-hydroxylase cDNA clone corresponding to the Ht1 locus of Petunia hybrida. (1999) (https://pubmed.ncbi.nlm.nih.gov/10504566)

Authors

Brugliera F; Barri-Rewell G; Holton TA; Mason JG

Abstract

We have isolated a cDNA clone that corresponds to the Ht1 locus of petunia which controls the hydroxylation of dihydrokaempferol to dihydroquercetin and of naringenin to eriodictyol by the action of flavonoid 3'-hydroxylase (F3'H). The cDNA encodes a 512 amino acid polypeptide with regions of similarity to petunia flavonoid 3',5'-hydroxylases (F3'5'H). Both F3'H and F3'5'H are cytochromes P450 and are key enzymes in the flavonoid pathway leading to the production of the coloured anthocyanins. The F3 'H transcript is most abundant in petals from flowers at an early stage of development and levels decline as the flower matures. Transcripts are also detected in the ovaries, sepals, peduncles, stems and anthers of the petunia plant. No or very reduced levels of transcripts are detected in ht1/ht1 lines. This is the first report of isolation of a F3 'H cDNA clone from any species.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS