

GEPHE SUMMARY

an2-like (Stan2) (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~an2-like+(Stan2)^#gephebase-summary-title)	Gephebase Gene	GP00000088	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology^#gephebase-summary-title)	Trait Category
Coloration (tuber skin) (https://www.gephebase.org/search-criteria?/and+Trait=~Coloration+(tuber+skin)^#gephebase-summary-title)	Trait
Solanum tuberosum - red tuber	Trait State in Taxon A
Solanum tuberosum -white tuber	Trait State in Taxon B
Data not curated	Ancestral State
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Domesticated^#gephebase-summary-title)	Taxonomic Status

Taxon A	Latin Name	Taxon B	Latin Name
Solanum tuberosum (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Solanum+tuberosum^#gephebase-summary-title)	Solanum tuberosum	Solanum tuberosum (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Solanum+tuberosum^#gephebase-summary-title)	Solanum tuberosum
potato	Common Name	potato	Common Name
Solanum tuberosum subsp. tuberosum; potato; potatoes; Solanum tuberosum L.	Synonyms	Solanum tuberosum subsp. tuberosum; potato; potatoes; Solanum tuberosum L.	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Solanaeae; Solanum	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Solanaeae; Solanum	Lineage
Solanum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4107)	Parent	Solanum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4107)	Parent
4113 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4113)	NCBI Taxonomy ID	4113 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4113)	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

AN2	Generic Gene Name	A4GRU8 (http://www.uniprot.org/uniprot/A4GRU8)	UniProtKB Petunia integrifolia
-	Synonyms	ACT36617 (https://www.ncbi.nlm.nih.gov/nuccore/ACT36617)	GenebankID or UniProtKB
-	String		
-	Sequence Similarities		
-	GO - Molecular Function		
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)	GO - Biological Process		
-	GO - Cellular Component		
GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)			Presumptive Null
Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~Unknown^#gephebase-summary-title)			Molecular Type
Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Cis-regulatory^#gephebase-summary-title)			

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

Aberration Type

unknown

Molecular Details of the Mutation

Linkage Mapping (<https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=~Linkage+Mapping~#gephebase-summary-title>)

Experimental Evidence

The potato developer (D) locus encodes an R2R3 MYB transcription factor that regulates expression of multiple anthocyanin structural genes in tuber skin. (2009) (<https://pubmed.ncbi.nlm.nih.gov/19779693/>)

Main Reference

Jung CS; Griffiths HM; De Jong DM; Cheng S; Bodis M; Kim TS; De Jong WS

Authors

A dominant allele at the D locus (also known as I in diploid potato) is required for the synthesis of red and purple anthocyanin pigments in tuber skin. It has previously been reported that D maps to a region of chromosome 10 that harbors one or more homologs of *Petunia an2*, an R2R3 MYB transcription factor that coordinately regulates the expression of multiple anthocyanin biosynthetic genes in the floral limb. To test whether D acts similarly in tuber skin, RT-PCR was used to evaluate the expression of flavanone 3-hydroxylase (*f3h*), dihydroflavonol 4-reductase (*dfr*) and flavonoid 3',5'-hydroxylase (*f3'5'h*). All three genes were expressed in the periderm of red- and purple-skinned clones, while *dfr* and *f3'5'h* were not expressed, and *f3h* was only weakly expressed, in white-skinned clones. A potato cDNA clone with similarity to *an2* was isolated from an expression library prepared from red tuber skin, and an assay developed to distinguish the two alleles of this gene in a diploid potato clone known to be heterozygous Dd. One allele was observed to cosegregate with pigmented skin in an F(1) population of 136 individuals. This allele was expressed in tuber skin of red- and purple-colored progeny, but not in white tubers, while other parental alleles were not expressed in white or colored tubers. The allele was placed under the control of a doubled 35S promoter and transformed into the light red-colored cultivar D'Amor, the white-skinned cultivar Bintje, and two white diploid clones known to lack the functional allele of D. Transformants accumulated pigment in tuber skin, as well as in other tissues, including young foliage, flower petals, and tuber flesh.

Abstract

Additional References

RELATED GEPHE

2 (dihydroflavonol reductase (DFR), flavonoid 3';5'-hydroxylase (F3'5'H)) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=~4113~/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title>)

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS