

GEPHE SUMMARY

	Gephebase Gene	GepheID
Beta-glucosidase6 (BGLU6) (<a +beta-glucosidase6+(bglu6)^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+Beta-glucosidase6+(BGLU6)^#gephebase-summary-title)	GP00001264	
	Entry Status	Main curator
Published	Courtier	

PHENOTYPIC CHANGE

	Trait Category	
Physiology (<a +physiology^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Physiology^#gephebase-summary-title)	Trait	
Resistance to UV irradiation (flavonol glycosylation) (<a +resistance+to+uv+irradiation+(flavonol+glycosylation)^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Resistance+to+UV+irradiation+(flavonol+glycosylation)^#gephebase-summary-title)	Trait State in Taxon A	
Arabidopsis thaliana- Ler0	Trait State in Taxon B	
Arabidopsis thaliana- Nd-1	Ancestral State	
Taxon A	Taxonomic Status	
Intraspecific (<a +intraspecific^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Intraspecific^#gephebase-summary-title)		
Taxon A	Taxon B	
Arabidopsis thaliana	Arabidopsis thaliana	Latin Name
(<a +arabidopsis+thaliana^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Arabidopsis+thaliana^#gephebase-summary-title)	(<a +arabidopsis+thaliana^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Arabidopsis+thaliana^#gephebase-summary-title)	
thale cress	thale cress	Common Name
		Synonyms
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	
species	species	Rank
		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	
Arabidopsis () - (Rank: genus)	Arabidopsis () - (Rank: genus)	Parent
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	
NCBI Taxonomy ID	NCBI Taxonomy ID	
3702	3702	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	
is Taxon A an Infrapopulation?	is Taxon B an Infrapopulation?	
Yes	Yes	
Taxon A Description	Taxon B Description	
Arabidopsis thaliana- Ler0	Arabidopsis thaliana- Nd-1	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Arabidopsis thaliana
BGLU6	Q682B4 (http://www.uniprot.org/uniprot/Q682B4)	
beta glucosidase 6; T13D8.16; T13D8_16; At1g60270		GenebankID or UniProtKB
	String	3767579 (https://www.ncbi.nlm.nih.gov/nucleotide/3767579)
3702.AT1G60270.1		
(http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT1G60270.1)		
	Sequence Similarities	
Belongs to the glycosyl hydrolase 1 family.		
	GO - Molecular Function	
GO:0008422 : beta-glucosidase activity		
(https://www.ebi.ac.uk/QuickGO/term/GO:0008422)		
GO:0102483 : scopolin beta-glucosidase activity		

(<https://www.ebi.ac.uk/QuickGO/term/GO:0102483>)

GO - Biological Process

GO:0005975 : carbohydrate metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005975>)

GO - Cellular Component

-

Presumptive Null

Yes ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Yes~#gephebase-summary-title](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](https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Coding~#gephebase-summary-title))

Aberration Type

Deletion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=~Deletion~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=~Deletion~#gephebase-summary-title))

Deletion Size

1-9 bp

Molecular Details of the Mutation

1-bp deletion of a splice site at position 395

Experimental Evidence

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

Main Reference

Natural variation in flavonol accumulation in Arabidopsis is determined by the flavonol glucosyltransferase BGLU6. (2016) (<https://pubmed.ncbi.nlm.nih.gov/26717955>)

Authors

Ishihara H; Tohge T; ViehÄqver P; Fernie AR; Weisshaar B; Stracke R

Abstract

Flavonols are colourless secondary metabolites, primarily regarded as UV-protection pigments that are deposited in plants in their glycosylated forms. The glycosylation of flavonols is mainly catalysed by UDP-sugar-dependent glycosyltransferases (UGTs). Although the structures of flavonol glycosides accumulating in *Arabidopsis thaliana* are known, many genes involved in the flavonol glycosylation pathway are yet to be discovered. The flavonol glycoside profiles of seedlings from 81 naturally occurring *A. thaliana* accessions were screened using high performance thin layer chromatography. A qualitative variation in flavonol 3-O-gentiobioside 7-O-rhamnoside (F3GG7R) content was identified. Ler Col-0 recombinant inbred line mapping and whole genome association mapping led to the identification of a glycoside hydrolase family 1-type gene, At1g60270/BGLU6, that encodes a homolog of acyl-glucose-dependent glycosyltransferases involved in the glycosylation of anthocyanins, possibly localized in the cytoplasm, and that is co-expressed with genes linked to phenylpropanoid biosynthesis. A causal single nucleotide polymorphism introducing a premature stop codon in non-producer accessions was found to be absent in the producers. Several other naturally occurring loss-of-function alleles were also identified. Two independent bglu6 T-DNA insertion mutants from the producer accessions showed loss of F3GG7R. Furthermore, bglu6 mutant lines complemented with the genomic Ler BGLU6 gene confirmed that BGLU6 is essential for production of F3GGR7. We have thus identified an accession-specific gene that causes a qualitative difference in flavonol glycoside accumulation in *A. thaliana* strains. This gene encodes a flavonol 3-O-glucoside: 6â€³-O-glucosyltransferase that does not belong to the large canonical family of flavonol glycosyltransferases that use UDP-conjugates as the activated sugar donor substrate.

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Additional References

The genetics of plant metabolism. (2006) (<https://pubmed.ncbi.nlm.nih.gov/16751770>)

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

4 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~Beta-glucosidase6 \(BGLU6\)~/and+Taxon ID=~3702~/or+Gene Gephebase=~Beta-glucosidase6 \(BGLU6\)~/and+Taxon ID=~3702~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=~Beta-glucosidase6+(BGLU6)~/and+Taxon+ID=~3702~/or+Gene+Gephebase=~Beta-glucosidase6+(BGLU6)~/and+Taxon+ID=~3702~#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

@Splicing - vast gene region previously detected in two QTL papers; QTL + mapping