

## GEPHE SUMMARY

	Gephebase Gene		GepheID
Beta-glucosidase6 (BGLU6) ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> )		GP00001266	
Gephebase="Beta-glucosidase6 (BGLU6)"#gephebase-summary-title)			Main curator
Published	Entry Status	Courtier	

## PHENOTYPIC CHANGE

	Trait Category		
Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> )			
Category="Physiology"#gephebase-summary-title)	Trait		
Resistance to UV irradiation (flavonol glycosylation) ( <a (flavonol="" glycosylation)"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=" irradiation="" resistance="" to="" uv="">https://www.gephebase.org/search-criteria?/and+Trait="Resistance to UV irradiation (flavonol glycosylation)"#gephebase-summary-title</a> )			
Arabidopsis thaliana- Ler0	Trait State in Taxon A		
Arabidopsis thaliana- Bor-4; Se-0; Uod-1; and Zdr-1	Trait State in Taxon B		
Taxon A	Ancestral State		
Intraspecific ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> )	Taxonomic Status		
Status="Intraspecific"#gephebase-summary-title)			
Taxon A	Latin Name	Taxon B	Latin Name
Arabidopsis thaliana		Arabidopsis thaliana	
( <a arabidopsis="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" thaliana"#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Arabidopsis thaliana"#gephebase-summary-title</a> )		( <a arabidopsis="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" thaliana"#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Arabidopsis thaliana"#gephebase-summary-title</a> )	
thale cress	Common Name	thale cress	Common Name
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Synonyms	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	Lineage
Arabidopsis () - (Rank: genus)	Parent	Arabidopsis () - (Rank: genus)	Parent
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701</a> )	NCBI Taxonomy ID	( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701</a> )	NCBI Taxonomy ID
3702		3702	
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702</a> )	is Taxon A an Infrappecies?	( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702</a> )	is Taxon B an Infrappecies?
Yes		Yes	
Arabidopsis thaliana- Ler0	Taxon A Description	Arabidopsis thaliana- Bor-4; Se-0; Uod-1; and Zdr-1	Taxon B Description

## GENOTYPIC CHANGE

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

A deletion of one nucleotide in the seventh exon (BGLU6 CDS position 678) results in a premature stop codon in the accessions Bor-4, Se-0, Uod-1, and Zdr-1. premature stop codon

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; Viehöver 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 F3GG7R. 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: 6-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

Vast gene region previously detected in two QTL papers: QTL + mapping