

|                                                                                                                                                     |                |              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------|
|                                                                                                                                                     | 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> ) | GP00001267     |              |
| Gephebase="Beta-glucosidase6 (BGLU6)"#gephebase-summary-title)                                                                                      |                | Main curator |
|                                                                                                                                                     | Entry Status   | Arnoult      |
| Published                                                                                                                                           |                |              |

|                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                                                                                                                                                                                                                     |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 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</a> )                                                                                                                |  | Trait Category                                                                                                                                                                                                                                                                      |  |
| 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</a> ) |  | Trait                                                                                                                                                                                                                                                                               |  |
| Arabidopsis thaliana- Ler0                                                                                                                                                                                                                                                                                                                                |  | Trait State in Taxon A                                                                                                                                                                                                                                                              |  |
| Arabidopsis thaliana- Col0                                                                                                                                                                                                                                                                                                                                |  | Trait State in Taxon B                                                                                                                                                                                                                                                              |  |
| Data not curated                                                                                                                                                                                                                                                                                                                                          |  | Ancestral State                                                                                                                                                                                                                                                                     |  |
| 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</a> )                                                                                                   |  | Taxonomic Status                                                                                                                                                                                                                                                                    |  |
| Taxon A                                                                                                                                                                                                                                                                                                                                                   |  | Taxon B                                                                                                                                                                                                                                                                             |  |
| Arabidopsis thaliana<br>( <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<br>( <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> ) |  |
| thale cress                                                                                                                                                                                                                                                                                                                                               |  | thale cress                                                                                                                                                                                                                                                                         |  |
| 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                                                                                                                                                                                                                                                                             |  |
| cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis                                                                        |  | cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis  |  |
| Arabidopsis () - (Rank: genus)<br>( <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> )                                                                                                                                                                     |  | Arabidopsis () - (Rank: genus)<br>( <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<br>( <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> )                                                                                                                                                                              |  | NCBI Taxonomy ID 3702<br>( <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 Intraspecies?                                                                                                                                                                                                                                                                                                                               |  | is Taxon B an Intraspecies?                                                                                                                                                                                                                                                         |  |
| Yes                                                                                                                                                                                                                                                                                                                                                       |  | Yes                                                                                                                                                                                                                                                                                 |  |
| Taxon A Description                                                                                                                                                                                                                                                                                                                                       |  | Taxon B Description                                                                                                                                                                                                                                                                 |  |
| Arabidopsis thaliana- Ler0                                                                                                                                                                                                                                                                                                                                |  | Arabidopsis thaliana- Col0                                                                                                                                                                                                                                                          |  |

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

(<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

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

SNP Coding Change

Nonsense

Molecular Details of the Mutation

GAG to stop codon TAG at position 1138

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))

|            | Taxon A | Taxon B | Position |
|------------|---------|---------|----------|
| Codon      | -       | -       | -        |
| Amino-acid | -       | -       | -        |

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; ViehÄ¶ver 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 glucosyltransferases 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: 6-Ö3-O-glucosyltransferase that does not belong to the large canonical family of flavonol glucosyltransferases 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

