

GEPHE SUMMARY

GLABROUS1 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^GLABROUS1^#gephebase-summary-title)	Gephebase Gene	GP00001239	GepheID
Published	Entry Status	Arnoult	Main curator

PHENOTYPIC CHANGE

	Trait Category
Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category=Morphology^#gephebase-summary-title)	Trait
Trichome density (leaf) (https://www.gephebase.org/search-criteria?/and+Trait=^Trichome density (leaf)^#gephebase-summary-title)	Trait State in Taxon A
Arabidopsis thaliana- Colo	Trait State in Taxon B
Arabidopsis thaliana 9354 - Glabrous	Ancestral State
Data not curated	Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)	

Taxon A		Taxon B	
	Latin Name		Latin Name
Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)	Common Name	Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)	Common Name
thale cress	Synonyms	thale cress	Synonyms
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Rank	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Rank
species	Lineage	species	Lineage
cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Parent	cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Parent
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	NCBI Taxonomy ID	Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	NCBI Taxonomy ID
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)		3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	
Yes	is Taxon A an Infraspecies?	Yes	is Taxon B an Infraspecies?
Arabidopsis thaliana- Colo	Taxon A Description	Arabidopsis thaliana 9354	Taxon B Description

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Arabidopsis thaliana
GL1	Synonyms	P27900 (http://www.uniprot.org/uniprot/P27900)	GenebankID or UniProtKB
ATGL1; ATMYB0; GL1; GLABRA 1; myb domain protein 0; TRICHOME DIFFERENTIATION PROTEIN GL1; MYB0; At3g27920; K16N12.17	String	ABD65321 (https://www.ncbi.nlm.nih.gov/nuccore/ABD65321)	
3702.AT3G27920.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT3G27920.1)	Sequence Similarities	-	
-	GO - Molecular Function	GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)	GO:0043565 : sequence-specific DNA binding

(<https://www.ebi.ac.uk/QuickGO/term/GO:0043565>)
 GO:0044212 : transcription regulatory region DNA binding
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0044212>)
 GO:0003677 : DNA binding (<https://www.ebi.ac.uk/QuickGO/term/GO:0003677>)
 GO - Biological Process
 GO:0030154 : cell differentiation (<https://www.ebi.ac.uk/QuickGO/term/GO:0030154>)
 GO:0009740 : gibberellic acid mediated signaling pathway
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0009740>)
 GO:0001708 : cell fate specification (<https://www.ebi.ac.uk/QuickGO/term/GO:0001708>)
 GO:0009867 : jasmonic acid mediated signaling pathway
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0009867>)
 GO:0010026 : trichome differentiation
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0010026>)
 GO:0032880 : regulation of protein localization
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0032880>)
 GO:2000039 : regulation of trichome morphogenesis
 (<https://www.ebi.ac.uk/QuickGO/term/GO:2000039>)
 GO:0048629 : trichome patterning (<https://www.ebi.ac.uk/QuickGO/term/GO:0048629>)
 GO - Cellular Component

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

Presumptive Null

No (<https://www.gephbase.org/search-criteria?/and+Presumptive+Null=^No^#gephbase-summary-title>)

Molecular Type

Coding (<https://www.gephbase.org/search-criteria?/and+Molecular+Type=^Coding^#gephbase-summary-title>)

Aberration Type

SNP (<https://www.gephbase.org/search-criteria?/and+Aberration+Type=^SNP^#gephbase-summary-title>)

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

S92F

Experimental Evidence

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

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

Main Reference

Trichome distribution in *Arabidopsis thaliana* and its close relative *Arabidopsis lyrata*: molecular analysis of the candidate gene GLABROUS1. (2001)
 (<https://pubmed.ncbi.nlm.nih.gov/11504855>)

Authors

Hauser MT; Harr B; SchlÄ¶tterer C

Abstract

GLABROUS1 (GL1) belongs to the large family of MYB transcription factors and is known to play a central role in trichome initiation. We studied trichome distribution and the molecular variation of GL1 in 28 *A. thaliana* accessions. Trichome density on rosette leaves was highly variable among those accessions. On the molecular level, we detected substantial sequence variation in a 3-kb fragment which included the complete coding region of the GL1 locus ($\pi = 0.01$). Phylogenetic analysis of GL1 indicates the presence of two diverged clades among 28 accessions. Using ANOVA, we show that the phenotypic variation in trichome density cannot be explained by the sequence divergence between the two phylogenetic lineages. Sequence analysis of wild-type *Arabidopsis thaliana* and *Arabidopsis lyrata* accessions indicates that all amino acid substitutions are located outside of the conserved helix-turn-helix DNA-binding domains R2 and R3. Using plants of *A. thaliana* and *A. lyrata* with either naturally occurring or ethyl methane sulfonate--induced glabrous phenotypes, we demonstrate that the last 14 C-terminal amino acids of the GL1 gene have no major impact on the initiation of trichomes.

Additional References

Trichome distribution in *Arabidopsis thaliana* and its close relative *Arabidopsis lyrata*: molecular analysis of the candidate gene GLABROUS1. (2001)
 (<https://pubmed.ncbi.nlm.nih.gov/11504855>)

RELATED GEPHE

2 (AtMYC1, ETC2) (https://www.gephbase.org/search-criteria?/or+Taxon+ID=^3702^/and+Trait=Trichome+density/and+groupHaplotypes=true#gephbase-summary-title)	Related Genes Related Haplotypes
4 (https://www.gephbase.org/search-criteria?/or+Gene+Gephebase=^GLABROUS1^/and+Taxon+ID=^3702^/or+Gene+Gephebase=^GLABROUS1^/and+Taxon+ID=^3702^#gephbase-summary-title)	

EXTERNAL LINKS

COMMENTS

Based on previous mappings showing the involvement of GL1 locus on trichome density; complementation test with glabrous mutant