

GEPHE SUMMARY

GLABROUS1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^GLABROUS1^#gephebase-summary-title)	Gephebase Gene	GP00001242	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=^Morphology^#gephebase-summary-title)	Trait Category		
Trichome density (leaf) (https://www.gephebase.org/search-criteria?/and+Trait=^Trichome+density+(leaf)^#gephebase-summary-title)	Trait		
Arabidopsis thaliana haplotype A (28 accessions)	Trait State in Taxon A		
Arabidopsis thaliana haplotype B (66 accessions) - Glabrous	Trait State in Taxon B		
Data not curated	Ancestral State		
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Intraspecific^#gephebase-summary-title)	Taxonomic Status		

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)	Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)	Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)	Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)
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; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	Lineage
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	Parent	Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	Parent
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	NCBI Taxonomy ID	3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	NCBI Taxonomy ID
No	is Taxon A an Infrappecies?	No	is Taxon B an Infrappecies?

GENOTYPIC CHANGE

GL1	Generic Gene Name	P27900 (http://www.uniprot.org/uniprot/P27900)	UniProtKB Arabidopsis thaliana
ATGL1; ATMYB0; GL1; GLABRA 1; myb domain protein 0; TRICHOME DIFFERENTIATION PROTEIN GL1; MYB0; At3g27920; K16N12.17	Synonyms	ABD65321 (https://www.ncbi.nlm.nih.gov/nucleotide/ABD65321)	GenebankID or UniProtKB
3702.AT3G27920.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT3G27920.1)	String		
-	Sequence Similarities		
GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)	GO - Molecular Function		
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.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null+No^#gephebase-summary-title))

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

high frequency pattern of polymorphism identified in the third exon and 3' flank

Experimental Evidence

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

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; Schl 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 ($p = 0.01$). 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

Related Genes

2 (*AtMYC1*, *ETC2*) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=^3702^/and+Trait=Trichome density/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID+3702^/and+Trait+Trichome+density/and+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

4 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^GLABROUS1^/and+Taxon ID=^3702^/or+Gene Gephebase=^GLABROUS1^/and+Taxon ID=^3702^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase+GLABROUS1^/and+Taxon+ID+3702^/or+Gene+Gephebase+GLABROUS1^/and+Taxon+ID+3702^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

Based on previous mappings showing the involvement of *GL1* locus on trichome density. Mean trichome densities were 10.82 and 13.13 for haplogroups A and B, respectively; yielding a 17.6% difference between groups and accounting for 11% of the trichome density variation observed in the set of 94 lines

