

GEPHE SUMMARY

AtMYC1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^AtMYC1^#gephebase-summary-title)	Gephebase Gene	GP00001268	GepheID
Published	Entry Status	Arnoult	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- Col0	Trait State in Taxon A		
Arabidopsis thaliana- Ler0	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
Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)	Latin Name	Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)	Latin Name
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
Yes	is Taxon A an Intraspecies?	Yes	is Taxon B an Intraspecies?
Arabidopsis thaliana- Col0	Taxon A Description	Arabidopsis thaliana- Ler0	Taxon B Description

GENOTYPIC CHANGE

BHLH12	Generic Gene Name	Q8W2F1 (http://www.uniprot.org/uniprot/Q8W2F1)	UniProtKB Arabidopsis thaliana
F6N23.22; F6N23_22; myc1; EN58; MYC1; At4g00480	Synonyms	0	GenebankID or UniProtKB
3702.AT4G00480.2 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT4G00480.2)	String		
-	Sequence Similarities		
GO:0046983 : protein dimerization activity (https://www.ebi.ac.uk/QuickGO/term/GO:0046983)	GO - Molecular Function		
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)	GO - Biological Process		

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>)

Molecular Type

Coding (<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>)

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

P189A

Experimental Evidence

Linkage Mapping (<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 allelic variation defines a role for *ATMYC1*: trichome cell fate determination. (2011) (<https://pubmed.ncbi.nlm.nih.gov/21695236>)

Authors

Symonds VV; Hatlestad G; Lloyd AM

Abstract

The molecular nature of biological variation is not well understood. Indeed, many questions persist regarding the types of molecular changes and the classes of genes that underlie morphological variation within and among species. Here we have taken a candidate gene approach based on previous mapping results to identify the gene and ultimately a polymorphism that underlies a trichome density QTL in *Arabidopsis thaliana*. Our results show that natural allelic variation in the transcription factor *ATMYC1* alters trichome density in *A. thaliana*; this is the first reported function for *ATMYC1*. Using site-directed mutagenesis and yeast two-hybrid experiments, we demonstrate that a single amino acid replacement in *ATMYC1*, discovered in four ecotypes, eliminates known protein-protein interactions in the trichome initiation pathway. Additionally, in a broad screen for molecular variation at *ATMYC1*, including 72 *A. thaliana* ecotypes, a high-frequency block of variation was detected that results in >10% amino acid replacement within one of the eight exons of the gene. This sequence variation harbors a strong signal of divergent selection but has no measurable effect on trichome density. Homologs of *ATMYC1* are pleiotropic, however, so this block of variation may be the result of natural selection having acted on another trait, while maintaining the trichome density role of the gene. These results show that *ATMYC1* is an important source of variation for epidermal traits in *A. thaliana* and indicate that the transcription factors that make up the *TTG1* genetic pathway generally may be important sources of epidermal variation in plants.

Additional References

Mapping quantitative trait loci in multiple populations of *Arabidopsis thaliana* identifies natural allelic variation for trichome density. (2005) (<https://pubmed.ncbi.nlm.nih.gov/15654092>)

RELATED GEPHE

Related Genes

2 (ETC2, GLABROUS1) (<https://www.gephebase.org/search-criteria?/or+Taxon ID=~3702^/and+Trait=Trichome density/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

Within the same locus; various substitutions haplotypes; mainly in exon 6; have probably been selected for another trait