

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

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- Col0	Trait State in Taxon B		
Arabidopsis thaliana- Ler0	Ancestral State		
Data not curated	Taxonomic Status		
Intraspecific (https://www.gephebase.org/search-criteria/?and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)			
Taxon A	Latin Name	Taxon B	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)	
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; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Lineage	cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; 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
is Taxon A an Infraspecies?		is Taxon B an Infraspecies?	
Yes	Taxon A Description	Yes	Taxon B Description
Arabidopsis thaliana- Col0		Arabidopsis thaliana- Ler0	

GENOTYPIC CHANGE

BHLH12	Generic Gene Name	UniProtKB Arabidopsis thaliana
F6N23.22; F6N23_22; myc1; EN58; MYC1; At4g00480	Synonyms	GenebankID or UniProtKB
3702.AT4G00480.2 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT4G00480.2)	String	0
-	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	-	-	-

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

Main Reference

Symonds VV; Hatlestad G; Lloyd AM

Authors

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