

GEPHE SUMMARY

	Gephebase Gene	GephelD
GIBBERELLIC ACID REQUIRING 1 (GA1) (https://www.gephebase.org/search-criteria/?and+Gene Gephebase=%GIBBERELLIC ACID REQUIRING 1 (GA1)%#gephebase-summary-title)	GP00000395	Main curator
	Entry Status	
Published	Martin	

PHENOTYPIC CHANGE

	Trait Category	
Morphology (https://www.gephebase.org/search-criteria/?and+Trait Category=%Morphology%#gephebase-summary-title)	Trait	
Flower morphology (https://www.gephebase.org/search-criteria/?and+Trait=%Flower morphology%#gephebase-summary-title)	Trait State in Taxon A	
Arabidopsis thaliana - Sha	Trait State in Taxon B	
Arabidopsis thaliana- Bay-0	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
Arabidopsis thaliana (https://www.gephebase.org/search-criteria/?and+Taxon and Synonyms=%Arabidopsis thaliana%#gephebase-summary-title)	Latin Name	Latin Name
thale cress	Common Name	Common Name
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Synonyms	Synonyms
species	Rank	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphylophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Lineage	Lineage
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3701)	Parent	Parent
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3702)	NCBI Taxonomy ID	NCBI Taxonomy ID
Yes	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
Arabidopsis thaliana - Sha	Taxon A Description	Taxon B Description
		Arabidopsis thaliana- Bay-0

GENOTYPIC CHANGE

GA1	Generic Gene Name	UniProtKB Arabidopsis thaliana
	Synonyms	GenebankID or UniProtKB
ABC33; ARABIDOPSIS THALIANA ENT-COPALYL DIPHOSPHATE SYNTHETASE 1; ATCPS1; CPP synthase; CPS; CPS1; ENT-COPALYL DIPHOSPHATE SYNTHETASE; ENT-COPALYL DIPHOSPHATE SYNTHETASE 1; GA REQUIRING 1; T5J8.9; T5J8_9; TPSGA1; At4g02780	Q38802 (http://www.uniprot.org/uniprot/Q38802)	
3702.AT4G02780.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT4G02780.1)	String	U11034 (https://www.ncbi.nlm.nih.gov/nucleotide/U11034)
Belongs to the terpene synthase family. Tpsc subfamily.	Sequence Similarities	
	GO - Molecular Function	

GO:0000287 : magnesium ion binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0000287>)
GO:0009905 : ent-copalyl diphosphate synthase activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009905>)
GO:0010333 : terpene synthase activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010333>)

GO - Biological Process

GO:0009740 : gibberellic acid mediated signaling pathway
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009740>)
GO:0009686 : gibberellin biosynthetic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009686>)
GO:0016102 : diterpenoid biosynthetic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0016102>)

GO - Cellular Component

GO:0009507 : chloroplast (<https://www.ebi.ac.uk/QuickGO/term/GO:0009507>)

Presumptive Null

Unknown (<https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^Unknown^#gephebase-summary-title>)

Molecular Type

Unknown (<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>)

Molecular Details of the Mutation

unknown

Experimental Evidence

Linkage Mapping (<https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=^Linkage+Mapping^#gephebase-summary-title>)

Main Reference

Natural variation in GA1 associates with floral morphology in *Arabidopsis thaliana*. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22510148>)

Authors

Brock MT; Kover PX; Weinig C

Abstract

The genetic architecture of floral traits is evolutionarily important due to the fitness consequences of quantitative variation in floral morphology. Yet, little is known about the genes underlying these traits in natural populations. Using *Arabidopsis thaliana*, we examine molecular variation at GIBBERELLIC ACID REQUIRING 1 (GA1) and test for associations with floral morphology. We examined full-length sequence in 32 accessions and describe two haplotypes (comprising four nonsynonymous polymorphisms) in GA1 that segregate at intermediate frequencies. In 133 *A. thaliana* accessions, we test for genotype-phenotype associations and corroborate these findings in segregating progenies. The two common GA1 haplotypes were associated with the length of petals, stamens, and to a lesser extent style-stigma length. Associations were confirmed in a segregating progeny developed from 19 accessions. We find analogous results in recombinant inbred lines of the Bayreuth – Shahdara cross, which differ only at one of 4 SNPs, suggesting that this SNP may contribute to the observed association. Assuming GA1 causally affects floral organ size, it is interesting that adjacent petal and stamen whorls are most strongly affected. This pattern suggests that GA1 could contribute to the greater strength of petal-stamen correlations relative to other floral-length correlations observed in some Brassicaceae species.

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Additional References

RELATED GEPHE

Related Genes
1 (Cryptochrome 2 (CRY2) EDI allele) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=^3702^/and+Trait=Flower+morphology/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS