

GEPHE SUMMARY

	Gephebase Gene		GepheID
TZP (https://www.gephebase.org/search-criteria?/and+GeneGephebase=TZP#gephebase-summary-title)		GP00001269	
	Entry Status	Arnoult	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category		
Morphology (https://www.gephebase.org/search-criteria?/and+TraitCategory=Morphology#gephebase-summary-title)			
	Trait		
Plant growth (hypocotyl growth - light and temperature dependant) (https://www.gephebase.org/search-criteria?/and+Trait=Plant growth (hypocotyl growth - light and temperature dependant)#gephebase-summary-title)			
	Trait State in Taxon A		
Arabidopsis thaliana- Shahdara			
	Trait State in Taxon B		
Arabidopsis thaliana- Bay0			
	Ancestral State		
Unknown			
	Taxonomic Status		
Intraspecific (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=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)		Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=Arabidopsis thaliana#gephebase-summary-title)	
	Common Name		Common Name
thale cress		thale cress	
	Synonyms		Synonyms
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress		thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	
	Parent		Parent
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)		Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	
	NCBI Taxonomy ID		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)	
	is Taxon A an Infraspecies?		is Taxon B an Infraspecies?
Yes		Yes	
	Taxon A Description		Taxon B Description
Arabidopsis thaliana- Shahdara		Arabidopsis thaliana- Bay0	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Arabidopsis thaliana
TZP		Q9FIX7 (http://www.uniprot.org/uniprot/Q9FIX7)	
	Synonyms		GenebankID or UniProtKB
K9D7.13; K9D7_13; At5g43630		834383 (https://www.ncbi.nlm.nih.gov/nuccore/834383)	
	String		
3702.AT5G43630.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT5G43630.1)			
	Sequence Similarities		
-			
	GO - Molecular Function		
GO:0008134 : transcription factor binding (https://www.ebi.ac.uk/QuickGO/term/GO:0008134)			
GO:0008270 : zinc ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0008270)			

GO:0003677 : DNA binding (<https://www.ebi.ac.uk/QuickGO/term/GO:0003677>)
GO:1990269 : RNA polymerase II C-terminal domain phosphoserine binding (<https://www.ebi.ac.uk/QuickGO/term/GO:1990269>)

GO - Biological Process

GO:0009637 : response to blue light (<https://www.ebi.ac.uk/QuickGO/term/GO:0009637>)
GO:0006355 : regulation of transcription, DNA-templated (<https://www.ebi.ac.uk/QuickGO/term/GO:0006355>)
GO:0009785 : blue light signaling pathway (<https://www.ebi.ac.uk/QuickGO/term/GO:0009785>)
GO:0006368 : transcription elongation from RNA polymerase II promoter (<https://www.ebi.ac.uk/QuickGO/term/GO:0006368>)
GO:0001173 : DNA-templated transcriptional start site selection (<https://www.ebi.ac.uk/QuickGO/term/GO:0001173>)
GO:0016570 : histone modification (<https://www.ebi.ac.uk/QuickGO/term/GO:0016570>)

GO - Cellular Component

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)
GO:0016593 : Cdc73/Paf1 complex (<https://www.ebi.ac.uk/QuickGO/term/GO:0016593>)

Yes (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Yes~#gephebase-summary-title)	Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding~#gephebase-summary-title)	Molecular Type
Insertion (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Insertion~#gephebase-summary-title)	Aberration Type
1-9 bp	Insertion Size
8bp insertion causing premature stop	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title)	Experimental Evidence
A zinc knuckle protein that negatively controls morning-specific growth in Arabidopsis thaliana. (2008) (https://pubmed.ncbi.nlm.nih.gov/18971337)	Main Reference
Loudet O; Michael TP; Burger BT; Le Mett�� C; Mockler TC; Weigel D; Chory J	Authors
	Abstract

Growth in plants is modulated by a complex interplay between internal signals and external cues. Although traditional mutagenesis has been a successful approach for the identification of growth regulatory genes, it is likely that many genes involved in growth control remain to be discovered. In this study, we used the phenotypic variation between Bay-0 and Shahdara, two natural strains (accessions) of Arabidopsis thaliana, to map quantitative trait loci (QTL) affecting light- and temperature-regulated growth of the embryonic stem (hypocotyl). Using heterogeneous inbred families (HIFs), the gene underlying one QTL, LIGHT5, was identified as a tandem zinc knuckle/PLU3 domain encoding gene (At5g43630; TZP), which carries a premature stop codon in Bay-0. Hypocotyl growth assays in monochromatic light and microarray analysis demonstrate that TZP controls blue light associated growth in a time-of-day fashion by regulating genes involved in growth, such as peroxidase and cell wall synthesis genes. TZP expression is phased by the circadian clock and light/dark cycles to the beginning of the day, the time of maximal growth in A. thaliana in short-day conditions. Based on its domain structure and localization in the nucleus, we propose that TZP acts downstream of the circadian clock and photoreceptor signaling pathways to directly control genes responsible for growth. The identification of TZP thus provides new insight into how daily synchronization of growth pathways plays a critical role in growth regulation.

Additional References

RELATED GEPHE

5 (EARLY FLOWERING 3(ELF3) [possible pseudo-replicate], Enhanced shoot growth under mannitol stress 2 (EGM2), ILL1, FUMARASE 2, ICARUS1) (https://www.gephebase.org/search-criteria?/or+Taxon ID=~3702~/and+Trait=Plant growth/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

Bay-0 has a null allele AND a “positive” phenotype: hypocotyl elongation at T