

GEPHE SUMMARY

	Gephebase Gene		GepheID
phytochrome A-associated F-box protein (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~phytochrome A-associated F-box protein~#gephebase-summary-title)		GP00001287	
	Entry Status	Arnoult	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology~#gephebase-summary-title)		Trait	
Circadian rhythm (phase) (https://www.gephebase.org/search-criteria?/and+Trait=~Circadian rhythm (phase)~#gephebase-summary-title)		Trait State in Taxon A	
Solanum pimpinellifolium and pennellii		Trait State in Taxon B	
Solanum lycopersicum MoneyMaker and M82		Ancestral State	
Taxon A		Taxonomic Status	
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Domesticated~#gephebase-summary-title)			
	Taxon A		Taxon B
	Latin Name		Latin Name
Solanum pimpinellifolium (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Solanum pimpinellifolium~#gephebase-summary-title)		Solanum lycopersicum (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Solanum lycopersicum~#gephebase-summary-title)	
-	Common Name	tomato	Common Name
	Synonyms		Synonyms
Lycopersicon pimpinellifolium; Solanum pimpinellifolium var. racemigerum; currant tomato; Lycopersicon pimpinellifolium (L.) Mill.; Solanum pimpinellifolium L.		Lycopersicon esculentum var. esculentum; Solanum esculentum; Solanum lycopersicum var. humboldtii; tomato; Lycopersicon esculentum Mill.; Solanum esculentum Dunal; Solanum lycopersicum L.; Lycopersicon lycopersicum; Lycopersicum esculentum; Solanum lycopersicon	
species	Rank		Rank
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Solaneae; Solanum; Lycopersicon		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Solaneae; Solanum; Lycopersicon	
Lycopersicon () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=49274)	Parent		Parent
4084 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4084)	NCBI Taxonomy ID	Lycopersicon () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=49274)	NCBI Taxonomy ID
	is Taxon A an Intraspecies?	4081 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4081)	is Taxon B an Intraspecies?
No		Yes	
			Taxon B Description
		Solanum lycopersicum MoneyMaker and M82	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Solanum lycopersicum
101247753		K4CV85 (http://www.uniprot.org/uniprot/K4CV85)	
-	Synonyms		GenebankID or UniProtKB
	String	828008 (https://www.ncbi.nlm.nih.gov/nuccore/828008)	
4081.Solyc09g075080.2.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=4081.Solyc09g075080.2.1)			
	Sequence Similarities		
-			
	GO - Molecular Function		
-			

GO - Biological Process

GO:0048366 : leaf development (<https://www.ebi.ac.uk/QuickGO/term/GO:0048366>)
GO:0048573 : photoperiodism, flowering
(<https://www.ebi.ac.uk/QuickGO/term/GO:0048573>)
GO:0009585 : red, far-red light phototransduction
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009585>)
GO:0010099 : regulation of photomorphogenesis
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010099>)

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

Deletion (<https://www.gephebase.org/search-criteria?/and+Aberration Type=~Deletion~#gephebase-summary-title>)

Deletion Size

1-9 bp

Molecular Details of the Mutation

3bp deletion in CDS causing a 'K (lysine) loss in the highly conserved C terminus of EID1

Experimental Evidence

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

Main Reference

Domestication selected for deceleration of the circadian clock in cultivated tomato. (2016) (<https://pubmed.ncbi.nlm.nih.gov/26569124>)

Authors

MÃ¼ller NA; Wijnen CL; Srinivasan A; Ryngajlo M; Ofner I; Lin T; Ranjan A; West D; Maloof JN; Sinha NR; Huang S; Zamir D; JimÃ©nez-GÃ³mez JM

Abstract

The circadian clock is a critical regulator of plant physiology and development, controlling key agricultural traits in crop plants. In addition, natural variation in circadian rhythms is important for local adaptation. However, quantitative modulation of circadian rhythms due to artificial selection has not yet been reported. Here we show that the circadian clock of cultivated tomato (*Solanum lycopersicum*) has slowed during domestication. Allelic variation of the tomato homolog of the *Arabidopsis* gene *EID1* is responsible for a phase delay. Notably, the genomic region harboring *EID1* shows signatures of a selective sweep. We find that the *EID1* allele in cultivated tomatoes enhances plant performance specifically under long day photoperiods, suggesting that humans selected slower circadian rhythms to adapt the cultivated species to the long summer days it encountered as it was moved away from the equator.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

adaptation to long photoperiods ; another distinct QTL accounts for period elongation ; non-null