

## GEPHE SUMMARY

	Gephebase Gene		GepheID
EARLY FLOWERING 3(ELF3) ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> )		GP00001683	
Gephebase="EARLY FLOWERING 3(ELF3)"#gephebase-summary-title)			Main curator
Published	Entry Status	Courtier	

## PHENOTYPIC CHANGE

	Trait Category		
Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> )			
Category="Physiology"#gephebase-summary-title)	Trait		
Flowering time (latitudinal adaptation) ( <a (latitudinal="" adaptation)"#gephebase-summary-title"="" flowering="" href="https://www.gephebase.org/search-criteria?/and+Trait=" time="">https://www.gephebase.org/search-criteria?/and+Trait="Flowering time (latitudinal adaptation)"#gephebase-summary-title</a> )			
Glycine max	Trait State in Taxon A		
	Trait State in Taxon B		
LJ trait - LJ soybean varieties flower much later than temperate varieties under inductive short-day conditions and also show delayed maturity; leading to improvements in plant height; node number; lodging degree; grain yield; and other important agronomic characteristics in the field at low latitudes	Ancestral State		
Taxon A	Taxonomic Status		
Domesticated ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> )			
Status="Domesticated"#gephebase-summary-title)			
	Taxon A	Taxon B	
	Latin Name		Latin Name
Glycine max		Glycine max	
( <a glycine="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" max"#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Glycine max"#gephebase-summary-title</a> )		( <a glycine="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" max"#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Glycine max"#gephebase-summary-title</a> )	
	Common Name		Common Name
soybean		soybean	
	Synonyms		Synonyms
soybean; soybeans; Glycine max (L.) Merr.; Glycine max; cv. Wye		soybean; soybeans; Glycine max (L.) Merr.; Glycine max; cv. Wye	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Fabales; Fabaceae; Papilionoideae; 50 kb inversion clade; NPAAA clade; indigoferoid/millettioid clade; Phaseoleae; Glycine; Soja		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Fabales; Fabaceae; Papilionoideae; 50 kb inversion clade; NPAAA clade; indigoferoid/millettioid clade; Phaseoleae; Glycine; Soja	
	Parent		Parent
Soja () - (Rank: subgenus)		Soja () - (Rank: subgenus)	
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1462606">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1462606</a> )		( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1462606">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1462606</a> )	
	NCBI Taxonomy ID		NCBI Taxonomy ID
3847		3847	
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3847">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3847</a> )		( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3847">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3847</a> )	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		Yes	
			Taxon B Description
		LJ soybean	

## GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Arabidopsis thaliana
CYP75B1		Q9SD85 ( <a href="http://www.uniprot.org/uniprot/Q9SD85">http://www.uniprot.org/uniprot/Q9SD85</a> )	
	Synonyms		GenebankID or UniProtKB
CYP75B1; CYTOCHROME P450 75B1; D501; F13G24.190; F13G24_190; F3'H; FLAVONOID 3'-HYDROXYLASE; TRANSPARENT TESTA 7; TT7; At5g07990		()	
	String		
3702.AT5G07990.1			
( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT5G07990.1">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT5G07990.1</a> )			
	Sequence Similarities		
Belongs to the cytochrome P450 family.			
	GO - Molecular Function		

GO:0020037 : heme binding (<https://www.ebi.ac.uk/QuickGO/term/GO:0020037>)  
GO:0005506 : iron ion binding (<https://www.ebi.ac.uk/QuickGO/term/GO:0005506>)  
GO:0016709 : oxidoreductase activity, acting on paired donors, with incorporation or reduction of molecular oxygen, NAD(P)H as one donor, and incorporation of one atom of oxygen (<https://www.ebi.ac.uk/QuickGO/term/GO:0016709>)

GO - Biological Process

GO:0009733 : response to auxin (<https://www.ebi.ac.uk/QuickGO/term/GO:0009733>)  
GO:0009813 : flavonoid biosynthetic process (<https://www.ebi.ac.uk/QuickGO/term/GO:0009813>)

GO - Cellular Component

GO:0016021 : integral component of membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)  
GO:0016020 : membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0016020>)  
GO:0005789 : endoplasmic reticulum membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0005789>)

Presumptive Null

Yes ([https://www.gephebase.org/search-criteria?/and+Presumptive Null="+Yes"+#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=))

Molecular Type

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type="+Coding"+#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type=))

Aberration Type

Deletion ([https://www.gephebase.org/search-criteria?/and+Aberration Type="+Deletion"+#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=))

Deletion Size

10-99 bp

Molecular Details of the Mutation

recessive allele responsible for the LJ trait - 10-bp deletion predicted to cause a frameshift resulting in premature termination of translation after 195 amino acids in the 714-amino-acid protein

Experimental Evidence

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence="+Linkage Mapping"+#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=))

Main Reference

Natural variation at the soybean J locus improves adaptation to the tropics and enhances yield. (2017) (<https://pubmed.ncbi.nlm.nih.gov/28319089>)

Authors

Lu S; Zhao X; Hu Y; Liu S; Nan H; Li X; Fang C; Cao D; Shi X; Kong L; Su T; Zhang F; Li S; Wang Z; Yuan X; Cober ER; Weller JL; Liu B; Hou X; Tian Z; Kong F

Abstract

Soybean is a major legume crop originating in temperate regions, and photoperiod responsiveness is a key factor in its latitudinal adaptation. Varieties from temperate regions introduced to lower latitudes mature early and have extremely low grain yields. Introduction of the long-juvenile (LJ) trait extends the vegetative phase and improves yield under short-day conditions, thereby enabling expansion of cultivation in tropical regions. Here we report the cloning and characterization of J, the major classical locus conferring the LJ trait, and identify J as the ortholog of *Arabidopsis thaliana* EARLY FLOWERING 3 (ELF3). J depends genetically on the legume-specific flowering repressor E1, and J protein physically associates with the E1 promoter to downregulate its transcription, relieving repression of two important FLOWERING LOCUS T (FT) genes and promoting flowering under short days. Our findings identify an important new component in flowering-time control in soybean and provide new insight into soybean adaptation to tropical regions.

Additional References

## RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

## EXTERNAL LINKS

## COMMENTS